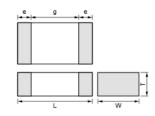
# Monolithic Ceramic Capacitors GR\_R6/R7/F5/E4 (X5R/X7R/Y5V/Z5U)

High Dielectric Constant Type 6.3/16/25/50V





Part Number		Dir	nensions (n	nm)	
rait Nullibei	L	W	T	е	g min.
GRM155	1.0 ±0.05	0.5 ±0.05	0.5 ±0.05	0.15 to 0.3	0.4
GRM188*	1.6 ±0.1	0.8 ±0.1	0.8 ±0.1	0.2 to 0.5	0.5
GRM216		1.25 ±0.1	0.6 ±0.1		0.7
GRM219	2.0 ±0.1		0.85 ±0.1	0.2 to 0.7	
GRM21B			1.25 ±0.1		
GRM319	2 2 ±0 45	1.6 ±0.15	0.85 ±0.1		
GRM31M	3.2 ±0.13	1.0 ±0.15	1.15 ±0.1	0.3 to 0.8	1.5
GRM31C	3.2 ±0.2	1.6 ±0.2	1.6 ±0.2		

<sup>\*</sup> Bulk Case : 1.6 ±0.07(L) × 0.8 ±0.07(W) × 0.8 ±0.07(T)

Part Number	TC Code	Rated Voltage (Vdc)	Capacitance*	Length L (mm)	Width W (mm)	Thickness T (mm)
GRM155R61A683KA01	X5R (EIA)	10	68000pF±10%	1.0	0.5	0.50
GRM155R61A104KA01	X5R (EIA)	10	0.1∝F±10%	1.0	0.5	0.50
GRM188R61A334KA61	X5R (EIA)	10	0.33 ∝F±10%	1.6	0.8	0.80
GRM188R61A474KA61	X5R (EIA)	10	0.47∝F±10%	1.6	0.8	0.80
GRM188R61A684KA61	X5R (EIA)	10	0.68∝F±10%	1.6	0.8	0.80
GRM188R61A105KA61	X5R (EIA)	10	1∝F ±10%	1.6	0.8	0.80
GRM188R60J105KA01	X5R (EIA)	6.3	1∝F ±10%	1.6	0.8	0.80
GRM219R61A105KC01	X5R (EIA)	10	1∝F ±10%	2.0	1.25	0.90
GRM21BR61A225KA01	X5R (EIA)	10	2.2∝F ±10%	2.0	1.25	1.25
GRM219R60J155KC01	X5R (EIA)	6.3	1.5∝F ±10%	2.0	1.25	0.90
GRM21BR60J225KA01	X5R (EIA)	6.3	2.2∝F ±10%	2.0	1.25	1.25
GRM21BR60J335KA11	X5R (EIA)	6.3	3.3∝F ±10%	2.0	1.25	1.25
GRM21BR60J475KA11	X5R (EIA)	6.3	4.7∝F ±10%	2.0	1.25	1.25
GRM319R61A225KC01	X5R (EIA)	10	2.2∝F ±10%	3.2	1.6	0.90
GRM31XR61A335KC12	X5R (EIA)	10	3.3∝F ±10%	3.2	1.6	1.30
GRM31CR61A475KA01	X5R (EIA)	10	4.7∝F ±10%	3.2	1.6	1.60
GRM31MR60J475KC11	X5R (EIA)	6.3	4.7∝F ±10%	3.2	1.6	1.15
GRM31CR61A106KA01	X5R (EIA)	10	10∝F ±10%	3.2	1.6	1.60
GRM31CR60J106KA01	X5R (EIA)	6.3	10∝F ±10%	3.2	1.6	1.60
GRM31CR60J226ME20	X5R (EIA)	6.3	22∝F ±20%	3.2	1.6	1.60
GRM32ER61A106KC01	X5R (EIA)	10	10∝F ±10%	3.2	2.5	2.50
GRM55DR61H106KA01	X5R (EIA)	50	10∝F ±10%	5.7	5.0	2.00
GRM15XR71H221KA86	X7R (EIA)	50	220pF±10%	1.0	0.5	0.25
GRM155R71H221KA01	X7R (EIA)	50	220pF±10%	1.0	0.5	0.50
GRM15XR71H331KA86	X7R (EIA)	50	330pF±10%	1.0	0.5	0.25
GRM155R71H331KA01	X7R (EIA)	50	330pF±10%	1.0	0.5	0.50
GRM15XR71H471KA86	X7R (EIA)	50	470pF±10%	1.0	0.5	0.25
GRM155R71H471KA01	X7R (EIA)	50	470pF±10%	1.0	0.5	0.50
GRM15XR71H681KA86	X7R (EIA)	50	680pF±10%	1.0	0.5	0.25
GRM155R71H681KA01	X7R (EIA)	50	680pF±10%	1.0	0.5	0.50
GRM15XR71H102KA86	X7R (EIA)	50	1000pF±10%	1.0	0.5	0.25
GRM155R71H102KA01	X7R (EIA)	50	1000pF±10%	1.0	0.5	0.50
GRM15XR71H152KA86	X7R (EIA)	50	1500pF±10%	1.0	0.5	0.25
GRM155R71H152KA01	X7R (EIA)	50	1500pF±10%	1.0	0.5	0.50
GRM155R71H222KA01	X7R (EIA)	50	2200pF±10%	1.0	0.5	0.50

GRM156R71H32KA01 X7R (EIA) 50 3300F±10% 10 0.5 GRM15K771H2ZKA01 X7R (EIA) 50 4700F±10% 10 0.5 GRM15K771H2ZKA08 X7R (EIA) 25 1200F±10% 10 0.5 GRM15K77E2ZKA08 X7R (EIA) 25 2200F±10% 10 0.5 GRM15K77E2ZKA08 X7R (EIA) 25 10000F±10% 10 0.5 GRM15K77E3ZKA08 X7R (EIA) 25 10000F±10% 10 0.5 GRM15K77E3ZKA08 X7R (EIA) 25 10000F±10% 10 0.5 GRM15K77C3ZKA08 X7R (EIA) 16 3300F±10% 10 0.5 GRM15K77E3ZKA08 X7R (EIA) 16 3300F±10% 10 0.5 GRM15K77C3ZKA08 X7R (EIA) 16 3300F±10% 10 0.5 GRM15K77C5ZKA08 X7R (EIA) 16 8600F±10% 10 0.5 GRM15K77C5ZKA08 X7R (EIA) 16 8600F±10% 10 0.5 GRM15K77C5ZKA08 X7R (EIA) 16 8600F±10% 10 0.5 GRM15K77C5ZKA04 X7R (EIA) 16 22000F±10% 10 0.5 GRM15K77C5ZKA01 X7R (EIA) 16 22000F±10% 10 0.5 GRM15K77C5ZKA01 X7R (EIA) 10 33000F±10% 10 0.5 GRM15K77C5ZKA01 X7R (EIA) 10 33000F±10% 10 0.5 GRM15K77C5ZKA01 X7R (EIA) 10 33000F±10% 10 0.5 GRM15K77C5ZKA01 X7R (EIA) 10 3300F±10% 10 0.5 GRM15K77C5ZKA01 X7R (EIA) 50 330F±10% 16 0.8 GRM15K77H3XKA01 X7R (EIA) 50 330F±10% 1.6 0.8 GRM15K77H3XKA01 X7R (EIA) 50 330F±10% 1.6 0.8 GRM15K77H3XKA01 X7R (EIA) 50 330F±10% 1.6 0.8 GRM15K77H3XKA01 X7R (EIA) 50 600F±10% 1.6 0.8 GRM15K77H3XKA01 X7R (EIA) 50 600F±10% 1.6 0.8 GRM15K77H3XKA01 X7R (EIA) 50 1000F±10% 1.6 0.8 GRM15K77H3XKA01 X7R (EIA) 50 4700F±10% 1.6 0.8 GRM15K77H3XKA01 X7R (EIA) 50 1000F±10%	art Number	TC Code	Rated Voltage (Vdc)	Capacitance*	Length L (mm)	Width W (mm)	Thickness (mm)
SRMISSRYTIESZKA86	71H332KA01	X7R (EIA)	50	3300pF±10%	1.0	0.5	0.50
RRM15KR71e22KA86	71H472KA01	X7R (EIA)	50	4700pF±10%	1.0	0.5	0.50
RM156R71E692KA01  X7R (EIA)  Z5 6800pF±10%  1.0  0.5  RM15KR712G3XKA88  X7R (EIA)  16  3300pF±10%  1.0  0.5  RM15KR712G3XKA88  X7R (EIA)  16  4700pF±10%  1.0  0.5  RM15KR712G82KA88  X7R (EIA)  16  8800pF±10%  1.0  0.5  RM15KR712G3XKA88  X7R (EIA)  16  8800pF±10%  1.0  0.5  RM15KR712G3XKA88  X7R (EIA)  16  8800pF±10%  1.0  0.5  RM15GR717G3XKA01  X7R (EIA)  16  22000pF±10%  1.0  0.5  RM15GR71A33XKA01  X7R (EIA)  10  33000pF±10%  1.0  0.5  RM15GR71A33XKA01  X7R (EIA)  10  33000pF±10%  1.0  0.5  RM15GR71A33XKA01  X7R (EIA)  50  220pF±10%  1.6  0.8  RM15GR71H33IKA01  X7R (EIA)  50  330pF±10%  1.6  0.8  RM15GR71H33IKA01  X7R (EIA)  50  330pF±10%  1.6  0.8  RM15GR71H5SKA01  X7R (EIA)  50  330pF±10%  1.6  0.8  RM15GR71H5SKA01  X7R (EIA)  50  300pF±10%  1.6  0.8  RM15GR71H5SKA01  X7R (EIA)  50  300pF±10%  1.6  0.8  RM15GR71H15KA01  X7R (EIA)  50  300pF±10%  1.6  0.8  RM15GR71H5SKA01  X7R (EIA)  50  300pF±10%  1.6  0.8  RM15GR71H5SKA01  X7R (EIA)  50  200pF±10%  1.6  0.8  RM15GR71H5SKA01  X7R (EIA)  50  300pF±10%  1.6  0.8  RM15GR71H5SKA01  X7R (EIA)  50  200pF±10%  1.6  0.8  RM15GR71H5SKA01  X7R (EIA)  50  200pF±10%  1.6  0.8  RM15GR71H5SKA01  X7R (EIA)  50  300pF±10%  1.6  0.8  RM15GR71H	71E182KA86	X7R (EIA)	25	1800pF±10%	1.0	0.5	0.25
RM158R711613KA01  X7R (EIA)  10 0.5  RM158R71C332KA88  X7R (EIA)  16 3300pF±10%  10 0.5  RM158R71C332KA88  X7R (EIA)  16 3300pF±10%  10 0.5  RM158R71C53SKA01  X7R (EIA)  16 6800pF±10%  10 0.5  RM158R71C15SKA01  X7R (EIA)  16 6800pF±10%  10 0.5  RM158R71C15SKA01  X7R (EIA)  16 15000pF±10%  10 0.5  RM158R71A33XKA01  X7R (EIA)  10 33000pF±10%  10 0.5  RM158R71A33XKA01  X7R (EIA)  10 4700pF±10%  10 0.5  RM158R71H32KA01  X7R (EIA)  50 220pF±10%  16 0.8  RM158R71H31KA01  X7R (EIA)  50 330pF±10%  16 0.8  RM158R71H31KA01  X7R (EIA)  50 470pF±10%  16 0.8  RM158R71H02KA01  X7R (EIA)  50 470pF±10%  16 0.8  RM158R71H02KA01  X7R (EIA)  50 470pF±10%  16 0.8  RM158R71H02KA01  X7R (EIA)  50 1000pF±10%  16 0.8  RM158R71H32KA01  X7R (EIA)  50 1000pF±10%  16 0.8  RM158R71H32KA01  X7R (EIA)  50 200pF±10%  16 0.8  RM158R71H32KA01  X7R (EIA)  50 1000pF±10%  16 0.8  RM158R71H32KA01  X7R (EIA)  50 200pF±10%  16 0.8  RM158R71H32KA01  X7R (EIA)  50 200pF±10%  16 0.8  RM158R71H32KA01  X7R (EIA)  50 200pF±10%  16 0.8  RM158R71H32KA01  X7R (EIA)  50 3300pF±10%  16 0.8  RM158R71H32KA01  X7R (EIA)  50 200pF±10%  16 0.8  RM158R71H32KA01  X7R (EIA)  50 3300pF±10%  16 0.8  RM158R71H32KA01  X7R (EIA)  50 4700pF±10%  16 0.8  RM158R71H32KA01  X7R (EIA)  50 3300pF±10%  16 0.8  RM158R71H32KA01  X7R (EIA)  50 4700pF±10%  16 0.8  RM158R71H32KA01  X7R (EIA)  50 4700pF±10%  16 0.8  RM158R71H33KA01  X7R (EIA)  50 4700pF±10%  16 0.8  RM158R71H35KA01  X7R	71E222KA86	X7R (EIA)	25	2200pF±10%	1.0	0.5	0.25
RM15XR71C332KA886	71E682KA01	X7R (EIA)	25	6800pF±10%	1.0	0.5	0.50
RM15XR71C472KA86  X7R (EIA)  16  4700pF±10%  1.0  0.5  RM15XR71C682KA86  X7R (EIA)  16  8800pF±10%  1.0  0.5  RM15SR71C32SXA01  X7R (EIA)  16  16  8900pF±10%  1.0  0.5  RM15SR71C32SXA01  X7R (EIA)  16  22000pF±10%  1.0  0.5  RM15SR71A33XA01  X7R (EIA)  10  3300pF±10%  1.0  0.5  RM15SR71A437XA01  X7R (EIA)  10  47000p±10%  1.0  0.5  RM15SR71A437XA01  X7R (EIA)  50  220pF±10%  1.0  0.5  RM15SR71H32XA01  X7R (EIA)  50  220pF±10%  1.0  0.5  RM15SR71H32XA01  X7R (EIA)  50  220pF±10%  1.6  0.8  RM15SR71H33XA01  X7R (EIA)  50  470pF±10%  1.6  0.8  RM15SR71H34XA01  X7R (EIA)  50  470pF±10%  1.6  0.8  RM15SR71H05XA01  X7R (EIA)  50  470pF±10%  1.6  0.8  RM15SR71H05XA01  X7R (EIA)  50  1000pF±10%  1.6  0.8  RM15SR71H32XA01  X7R (EIA)  50  2000pF±10%  1.6  0.8  RM15SR71H32XA01  X7R (EIA)  50  2000pF±10%  1.6  0.8  RM15SR71H32XA01  X7R (EIA)  50  300pF±10%  1.6  0.8  RM15SR71H32XA01  X7R (EIA)  50  4700pF±10%  1.6  0.8  RM15SR71H32XA01  X7R (EIA)  50  1000pF±10%  1.6  0	71E103KA01	X7R (EIA)	25	10000pF±10%	1.0	0.5	0.50
RM158R71C682KA86	71C332KA86	X7R (EIA)	16	3300pF±10%	1.0	0.5	0.25
X7R (EIA)	71C472KA86	X7R (EIA)	16	4700pF±10%	1.0	0.5	0.25
RM155R71C223KA01	71C682KA86	X7R (EIA)	16	6800pF±10%	1.0	0.5	0.25
RM155R71A333KA01	71C153KA01	X7R (EIA)	16	15000pF±10%	1.0	0.5	0.50
RM156R71A473KA01	71C223KA01	X7R (EIA)	16	22000pF±10%	1.0	0.5	0.50
RM18BR71H221KA01	71A333KA01	X7R (EIA)	10	33000pF±10%	1.0	0.5	0.50
RM188R71H331KA01	71A473KA01	X7R (EIA)	10	47000pF±10%	1.0	0.5	0.50
RM188R71H471KA01	71H221KA01	X7R (EIA)	50	220pF±10%	1.6	0.8	0.80
RM188R71H681KA01 X7R (EIA) 50 680pF±10% 1.6 0.8 RM188R71H102KA01 X7R (EIA) 50 1000pF±10% 1.6 0.8 RM188R71H102KA01 X7R (EIA) 50 1500pF±10% 1.6 0.8 RM188R71H1332KA01 X7R (EIA) 50 2200pF±10% 1.6 0.8 RM188R71H222KA01 X7R (EIA) 50 2200pF±10% 1.6 0.8 RM188R71H332KA01 X7R (EIA) 50 4700pF±10% 1.6 0.8 RM188R71H472KA01 X7R (EIA) 50 4700pF±10% 1.6 0.8 RM188R71H632KA01 X7R (EIA) 50 6800pF±10% 1.6 0.8 RM188R71H632KA01 X7R (EIA) 50 10000pF±10% 1.6 0.8 RM188R71H103KA01 X7R (EIA) 50 10000pF±10% 1.6 0.8 RM188R71H533KA01 X7R (EIA) 50 10000pF±10% 1.6 0.8 RM188R71H233KA01 X7R (EIA) 50 22000pF±10% 1.6 0.8 RM188R71E333KA01 X7R (EIA) 50 22000pF±10% 1.6 0.8 RM188R71E333KA01 X7R (EIA) 25 33000pF±10% 1.6 0.8 RM188R71E473KA01 X7R (EIA) 25 47000pF±10% 1.6 0.8 RM188R71E473KA01 X7R (EIA) 25 68000pF±10% 1.6 0.8 RM188R71E473KA01 X7R (EIA) 25 0.1∞F±10% 1.6 0.8 RM188R71E434KA01 X7R (EIA) 25 0.1∞F±10% 1.6 0.8 RM188R71E434KA01 X7R (EIA) 10 0.15∞F±10% 1.6 0.8 RM188R71A154KA01 X7R (EIA) 10 0.15∞F±10% 1.6 0.8 RM188R71A154KA01 X7R (EIA) 10 0.15∞F±10% 1.6 0.8 RM188R71A154KA01 X7R (EIA) 10 0.15∞F±10% 1.6 0.8 RM218R71A154KA01 X7R (EIA) 10 0.15∞F±10% 1.6 0.8 RM218R71A154KA01 X7R (EIA) 10 0.15∞F±10% 1.6 0.8 RM218R71H7333KA01 X7R (EIA) 50 47000pF±10% 2.0 1.25 RM21BR71H633KA01 X7R (EIA) 50 47000pF±10% 2.0 1.25 RM21BR71H633KA01 X7R (EIA) 50 47000pF±10% 2.0 1.25 RM21BR71H634KA01 X7R (EIA) 50 0.1∞F±10% 2.0 1.25 RM21BR71H634KA01 X7R (EIA) 50 0.1∞F±10% 2.0 1.25 RM21BR71H104KA01 X7R (EIA) 50 0.1∞F±10% 2.0 1.25 RM21BR71H104KA01 X7R (EIA) 50 0.1∞F±10% 2.0 1.25 RM21BR71E104KA01 X7R (EIA) 50 0.0∞F±10% 2.0 1.25 RM21BR71E104KA01 X7R (E	71H331KA01	X7R (EIA)	50	330pF±10%	1.6	0.8	0.80
RM188R71H102KA01	71H471KA01	X7R (EIA)	50	470pF±10%	1.6	0.8	0.80
RM188R71H152KA01  X7R (EIA)  X7R	71H681KA01	X7R (EIA)	50	680pF±10%	1.6	0.8	0.80
RM188R71H152KA01 X7R (EIA) 50 1500pF±10% 1.6 0.8 RM188R71H22KA01 X7R (EIA) 50 2200pF±10% 1.6 0.8 RM188R71H32XKA01 X7R (EIA) 50 3300pF±10% 1.6 0.8 RM188R71H32KA01 X7R (EIA) 50 4700pF±10% 1.6 0.8 RM188R71H682KA01 X7R (EIA) 50 4700pF±10% 1.6 0.8 RM188R71H33KA01 X7R (EIA) 50 10000pF±10% 1.6 0.8 RM188R71H103KA01 X7R (EIA) 50 10000pF±10% 1.6 0.8 RM188R71H135KA01 X7R (EIA) 50 15000pF±10% 1.6 0.8 RM188R71H23KA01 X7R (EIA) 50 22000pF±10% 1.6 0.8 RM188R71H23KA01 X7R (EIA) 50 42000pF±10% 1.6 0.8 RM188R71E333KA01 X7R (EIA) 25 33000pF±10% 1.6 0.8 RM188R71E333KA01 X7R (EIA) 25 47000pF±10% 1.6 0.8 RM188R71E683KA01 X7R (EIA) 25 68000pF±10% 1.6 0.8 RM188R71E683KA01 X7R (EIA) 25 68000pF±10% 1.6 0.8 RM188R71E104KA01 X7R (EIA) 25 0.1xF±10% 1.6 0.8 RM188R71E104KA01 X7R (EIA) 25 0.1xF±10% 1.6 0.8 RM188R71E104KA01 X7R (EIA) 10 0.1xF±10% 1.6 0.8 RM188R71E104KA01 X7R (EIA) 10 0.1xF±10% 1.6 0.8 RM188R71A224KA01 X7R (EIA) 10 0.1xF±10% 1.6 0.8 RM188R71A224KA01 X7R (EIA) 10 0.1xF±10% 1.6 0.8 RM121871H333KA01 X7R (EIA) 50 33000pF±10% 2.0 1.25 RM21BR71H333KA01 X7R (EIA) 50 47000pF±10% 2.0 1.25 RM21BR71H333KA01 X7R (EIA) 50 68000pF±10% 2.0 1.25 RM21BR71H34KA01 X7R (EIA) 50 68000pF±10% 2.0 1.25 RM21BR71H04KA01 X7R (EIA) 50 0.1xF±10% 2.0 1.25 RM21BR71H24KA01 X7R (EIA) 50 0.1xF±10% 2.0 1.25 RM21BR71H24KA01 X7R (EIA) 50 0.1xF±10% 2.0 1.25 RM21BR71H24KA01 X7R (EIA) 50 0.1xF±10% 2.0 1.25 RM21BR71E154KA01 X7R (EIA) 25 0.3xx±10% 2.0 1.25 RM21BR71E154KA01 X7R (EIA) 25 0.3xx±10	71H102KA01	X7R (EIA)	50	1000pF±10%	1.6	0.8	0.80
RM188R71H332KA01 X7R (EIA) X7R (EIA	71H152KA01	X7R (EIA)	50	1500pF±10%	1.6	0.8	0.80
RM188R71H472KA01  X7R (EIA)  X7R	71H222KA01	X7R (EIA)	50	2200pF±10%	1.6	0.8	0.80
RM188R71H472KA01  X7R (EIA)  X7R		, ,					0.80
RM188R71H682KA01		. ,					0.80
RM188R71H103KA01 X7R (EIA) 50 1000pF±10% 1.6 0.8 RM188R71H153KA01 X7R (EIA) 50 1500pF±10% 1.6 0.8 RM188R71H223KA01 X7R (EIA) 50 2200pF±10% 1.6 0.8 RM188R71E333KA01 X7R (EIA) 25 33000pF±10% 1.6 0.8 RM188R71E333KA01 X7R (EIA) 25 47000pF±10% 1.6 0.8 RM188R71E433KA01 X7R (EIA) 25 68000pF±10% 1.6 0.8 RM188R71E683KA01 X7R (EIA) 25 68000pF±10% 1.6 0.8 RM188R71E683KA01 X7R (EIA) 25 0.1∞F±10% 1.6 0.8 RM188R71E104KA01 X7R (EIA) 25 0.1∞F±10% 1.6 0.8 RM188R71E104KA01 X7R (EIA) 10 0.15∞F±10% 1.6 0.8 RM188R71A224KA01 X7R (EIA) 10 0.15∞F±10% 1.6 0.8 RM188R71A224KA01 X7R (EIA) 10 22000pF±10% 1.6 0.8 RM188R71A224KA01 X7R (EIA) 50 33000pF±10% 2.0 1.25 RM21BR71H333KA01 X7R (EIA) 50 47000pF±10% 2.0 1.25 RM21BR71H473KA01 X7R (EIA) 50 68000pF±10% 2.0 1.25 RM21BR71H04KA01 X7R (EIA) 50 0.1∞F±10% 2.0 1.25 RM21BR71H104KA01 X7R (EIA) 50 0.1∞F±10% 2.0 1.25 RM21BR71H104KA01 X7R (EIA) 50 0.1∞F±10% 2.0 1.25 RM21BR71H154KA01 X7R (EIA) 50 0.1∞F±10% 2.0 1.25 RM21BR71H224KA01 X7R (EIA) 50 0.1∞F±10% 2.0 1.25 RM21BR71H224KA01 X7R (EIA) 50 0.1∞F±10% 2.0 1.25 RM21BR71E104KA01 X7R (EIA) 50 0.1∞F±10% 2.0 1.25 RM21BR71E104KA01 X7R (EIA) 50 0.1∞F±10% 2.0 1.25 RM21BR71E104KA01 X7R (EIA) 25 0.1∞F±10% 2.0 1.25 RM21BR71E24KC01 X7R (EIA) 25 0.0∞F±10% 2.0 1.25 RM21BR71E24AK001 X7R (EIA) 25 0.0∞F±10% 2.0 1.25 RM21BR71E23AKC01 X7R (EIA) 16 0.0∞F±10% 2.0 1.25 RM21BR71E23AKC01 X7R (EIA) 16 0.							0.80
RM188R71H153KA01 X7R (EIA) 50 1500pF±10% 1.6 0.8 RM188R71H223KA01 X7R (EIA) 50 2200pF±10% 1.6 0.8 RM188R71E333KA01 X7R (EIA) 25 33000pF±10% 1.6 0.8 RM188R71E333KA01 X7R (EIA) 25 47000pF±10% 1.6 0.8 RM188R71E333KA01 X7R (EIA) 25 68000pF±10% 1.6 0.8 RM188R71E683KA01 X7R (EIA) 25 68000pF±10% 1.6 0.8 RM188R71E104KA01 X7R (EIA) 25 0.1xF±10% 1.6 0.8 RM188R71E104KA01 X7R (EIA) 16 0.1xF±10% 1.6 0.8 RM188R71A154KA01 X7R (EIA) 10 0.15xF±10% 1.6 0.8 RM188R71A224KA01 X7R (EIA) 10 0.15xF±10% 1.6 0.8 RM129R71H333KA01 X7R (EIA) 50 33000pF±10% 2.0 1.25 RM21BR71H473KA01 X7R (EIA) 50 47000pF±10% 2.0 1.25 RM21BR71H473KA01 X7R (EIA) 50 68000pF±10% 2.0 1.25 RM21BR71H404KA01 X7R (EIA) 50 0.1xF±10% 2.0 1.25 RM21BR71H104KA01 X7R (EIA) 50 0.15xF±10% 2.0 1.25 RM21BR71H104KA01 X7R (EIA) 50 0.15xF±10% 2.0 1.25 RM21BR71H154KA01 X7R (EIA) 50 0.15xF±10% 2.0 1.25 RM21BR71H224KA01 X7R (EIA) 50 0.15xF±10% 2.0 1.25 RM21BR71H224KA01 X7R (EIA) 50 0.15xF±10% 2.0 1.25 RM21BR71E104KA01 X7R (EIA) 25 0.1xF±10% 2.0 1.25 RM21BR71E24KC01 X7R (EIA) 25 0.1xF±10% 2.0 1.25 RM21BR71E24KC01 X7R (EIA) 25 0.1xF±10% 2.0 1.25 RM21BR71E24KC01 X7R (EIA) 25 0.1xF±10% 2.0 1.25 RM21BR71E34KC01 X7R (EIA) 25 0.3x x±10% 2.0 1.25 RM21BR71E34KC01 X7R (EIA) 25 0.3x x±10% 2.0 1.25 RM21BR71E34KC01 X7R (EIA) 25 0.3x x±10% 2.0 1.25 RM21BR71C474KC01 X7R (EIA) 16 0.47 xx±10% 2.0 1.25 RM21BR71C474KC01 X7R (EIA) 16 0.47 xx±10% 2.0 1.25 RM21BR71C474KC01 X7R (EIA) 16 0.68 xx±10% 2.0 1.25 RM21BR71C406KC01 X7R (EIA) 16 0.68 xx±10% 2.0 1.25 RM21BR71C406KC01 X7R (EIA) 16 0.68 xx±10% 3.2 1.6 RM31BR71E105KC01 X7R (EIA) 25 0.68 xx±10% 3.2 1.6 RM31BR				•			0.80
RM188R71H223KA01 X7R (EIA) 50 22000pF±10% 1.6 0.8 RM188R71E333KA01 X7R (EIA) 25 33000pF±10% 1.6 0.8 RM188R71E473KA01 X7R (EIA) 25 47000pF±10% 1.6 0.8 RM188R71E683KA01 X7R (EIA) 25 68000pF±10% 1.6 0.8 RM188R71E683KA01 X7R (EIA) 25 0.1xF±10% 1.6 0.8 RM188R71E104KA01 X7R (EIA) 25 0.1xF±10% 1.6 0.8 RM188R71C104KA01 X7R (EIA) 16 0.1xF±10% 1.6 0.8 RM188R71A154KA01 X7R (EIA) 10 0.15xF±10% 1.6 0.8 RM188R71A34KA01 X7R (EIA) 10 22000pF±10% 1.6 0.8 RM188R71A34KA01 X7R (EIA) 10 22000pF±10% 1.6 0.8 RM219R71H333KA01 X7R (EIA) 50 33000pF±10% 2.0 1.25 RM21BR71H473KA01 X7R (EIA) 50 47000pF±10% 2.0 1.25 RM21BR71H04KA01 X7R (EIA) 50 68000pF±10% 2.0 1.25 RM21BR71H04KA01 X7R (EIA) 50 0.1xF±10% 2.0 1.25 RM21BR71H154KA01 X7R (EIA) 50 0.1xF±10% 2.0 1.25 RM21BR71H154KA01 X7R (EIA) 50 0.1xF±10% 2.0 1.25 RM21BR71H224KA01 X7R (EIA) 25 0.1xF±10% 2.0 1.25 RM21BR71E104KA01 X7R (EIA) 25 0.1xF±10% 2.0 1.25 RM21BR71E104KA01 X7R (EIA) 25 0.1xF±10% 2.0 1.25 RM21BR71E134KC01 X7R (EIA) 25 0.1xF±10% 2.0 1.25 RM21BR71E224KC01 X7R (EIA) 25 0.3x xF±10% 2.0 1.25 RM21BR71E334KC01 X7R (EIA) 16 0.47 xF±10% 2.0 1.25 RM21BR71E334KC01 X7R (EIA) 16 0.68 xF±10% 3.2 1.6 RM31BR71E105KC01 X7R (EIA) 25 0.68 xF±10% 3.2 1		, ,					0.80
RM188R71E333KA01 X7R (EIA) 25 33000pF±10% 1.6 0.8 RM188R71E473KA01 X7R (EIA) 25 47000pF±10% 1.6 0.8 RM188R71E683KA01 X7R (EIA) 25 68000pF±10% 1.6 0.8 RM188R71E104KA01 X7R (EIA) 25 0.1xF±10% 1.6 0.8 RM188R71E104KA01 X7R (EIA) 25 0.1xF±10% 1.6 0.8 RM188R71A154KA01 X7R (EIA) 10 0.15xF±10% 1.6 0.8 RM188R71A154KA01 X7R (EIA) 10 22000pF±10% 1.6 0.8 RM188R71A33KA01 X7R (EIA) 10 22000pF±10% 1.6 0.8 RM188R71A33KA01 X7R (EIA) 50 33000pF±10% 2.0 1.25 RM21BR71H473KA01 X7R (EIA) 50 47000pF±10% 2.0 1.25 RM21BR71H683KA01 X7R (EIA) 50 68000pF±10% 2.0 1.25 RM21BR71H684KA01 X7R (EIA) 50 0.1xF±10% 2.0 1.25 RM21BR71H154KA01 X7R (EIA) 50 0.1xF±10% 2.0 1.25 RM21BR71H154KA01 X7R (EIA) 50 0.1xF±10% 2.0 1.25 RM21BR71H124KA01 X7R (EIA) 50 0.1xF±10% 2.0 1.25 RM21BR71E104KA01 X7R (EIA) 50 0.1xF±10% 2.0 1.25 RM21BR71E104KA01 X7R (EIA) 50 0.1xF±10% 2.0 1.25 RM21BR71E154KA01 X7R (EIA) 25 0.1xF±10% 2.0 1.25 RM21BR71E24KC01 X7R (EIA) 25 0.1xF±10% 2.0 1.25 RM21BR71E24KC01 X7R (EIA) 25 0.33 xF±10% 2.0 1.25 RM21BR71E24KC01 X7R (EIA) 25 0.33 xF±10% 2.0 1.25 RM21BR71E05KC01 X7R (EIA) 16 0.47xF±10% 2.0 1.25 RM21BR71C684KC01 X7R (EIA) 16 0.47xF±10% 2.0 1.25 RM31BR71E4684KC01 X7R (EIA) 16 0.47xF±10% 2.0 1.25 RM31BR71E684KC01 X7R (EIA) 16 0.47xF±10% 2.0 1.25 RM31BR71E684KC01 X7R (EIA) 16 0.47xF±10% 2.0 1.25 RM31BR71E684KC01 X7R (EIA) 16 0.47xF±10% 3.2 1.6 RM31BR71E105KC01 X7R (EIA) 50 0.33 xF±10% 3.2 1.6 RM31BR71E105KC01 X7R (EIA) 50 0.68xF±10% 3.2 1.6 RM31BR71E105KC01 X7R (EIA) 50 0.68xF±10% 3.2 1.6 RM31BR71E105KC01 X7R (EIA) 16 1xF±10% 3.2 1.6 RM31BR71E105KC01 X				•			0.80
RM188R71E473KA01		. ,		•			0.80
RM188R71E683KA01         X7R (EIA)         25         68000pF±10%         1.6         0.8           RM188R71E104KA01         X7R (EIA)         25         0.1∞F±10%         1.6         0.8           RM188R71C104KA01         X7R (EIA)         16         0.1∞F±10%         1.6         0.8           RM188R71A154KA01         X7R (EIA)         10         0.15∞F±10%         1.6         0.8           RM188R71A224KA01         X7R (EIA)         10         22000pF±10%         1.6         0.8           RM219R71H333KA01         X7R (EIA)         50         33000pF±10%         2.0         1.25           RM21BR71H683KA01         X7R (EIA)         50         47000pF±10%         2.0         1.25           RM21BR71H104KA01         X7R (EIA)         50         68000pF±10%         2.0         1.25           RM21BR71H154KA01         X7R (EIA)         50         0.1∞F±10%         2.0         1.25           RM21BR71H224KA01         X7R (EIA)         50         0.1∞F±10%         2.0         1.25           RM21BR71E104KA01         X7R (EIA)         25         0.1∞F±10%         2.0         1.25           RM21BR71E24KC01         X7R (EIA)         25         0.1∞F±10%         2.0         1.25 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>0.80</td>							0.80
RM188R71E104KA01         X7R (EIA)         25 $0.1αF±10\%$ 1.6         0.8           RM188R71C104KA01         X7R (EIA)         16 $0.1αF±10\%$ 1.6         0.8           RM188R71A154KA01         X7R (EIA)         10 $0.15αF±10\%$ 1.6         0.8           RM188R71A224KA01         X7R (EIA)         10         22000pF±10%         1.6         0.8           RM219R71H333KA01         X7R (EIA)         50         33000pF±10%         2.0         1.25           RM21BR71H473KA01         X7R (EIA)         50         47000pF±10%         2.0         1.25           RM21BR71H683KA01         X7R (EIA)         50         68000pF±10%         2.0         1.25           RM21BR71H104KA01         X7R (EIA)         50         0.1αF±10%         2.0         1.25           RM21BR71H224KA01         X7R (EIA)         50         0.1σε±10%         2.0         1.25           RM21BR71E104KA01         X7R (EIA)         50         0.1σε±10%         2.0         1.25           RM21BR71E24KC01         X7R (EIA)         25         0.1αε±10%         2.0         1.25           RM21BR71E334KC01         X7R (EIA)         25         0.1αε±10%         2.0         1.25		. ,		•			0.80
RM188R71C104KA01         X7R (EIA)         16         0.1αF±10%         1.6         0.8           RM188R71A154KA01         X7R (EIA)         10         0.15∞F±10%         1.6         0.8           RM188R71A224KA01         X7R (EIA)         10         22000pF±10%         1.6         0.8           RM219R71H333KA01         X7R (EIA)         50         33000pF±10%         2.0         1.25           RM219R71H473KA01         X7R (EIA)         50         47000pF±10%         2.0         1.25           RM219R71H683KA01         X7R (EIA)         50         68000pF±10%         2.0         1.25           RM219R71H104KA01         X7R (EIA)         50         0.1αF±10%         2.0         1.25           RM219R71H224KA01         X7R (EIA)         50         0.15∞F±10%         2.0         1.25           RM219R71E104KA01         X7R (EIA)         50         22000pF±10%         2.0         1.25           RM219R71E24KC01         X7R (EIA)         25         0.1αF±10%         2.0         1.25           RM219R71E334KC01         X7R (EIA)         25         22000pF±10%         2.0         1.25           RM219R71E474KC01         X7R (EIA)         25         0.33 αF±10%         2.0         1.25							0.80
RM188R71A154KA01		, ,					0.80
RM188R71A224KA01         X7R (EIA)         10         22000pF±10%         1.6         0.8           RM219R71H333KA01         X7R (EIA)         50         33000pF±10%         2.0         1.25           RM21BR71H473KA01         X7R (EIA)         50         47000pF±10%         2.0         1.25           RM21BR71H683KA01         X7R (EIA)         50         68000pF±10%         2.0         1.25           RM21BR71H104KA01         X7R (EIA)         50         0.1∞p±10%         2.0         1.25           RM21BR71H224KA01         X7R (EIA)         50         0.1∞p±10%         2.0         1.25           RM21BR71E104KA01         X7R (EIA)         50         22000pF±10%         2.0         1.25           RM21BR71E104KA01         X7R (EIA)         25         0.1∞p±10%         2.0         1.25           RM21BR71E154KA01         X7R (EIA)         25         0.1∞p±10%         2.0         1.25           RM21BR71E224KC01         X7R (EIA)         25         22000pF±10%         2.0         1.25           RM21BR71E334KC01         X7R (EIA)         25         0.33 ∞p±10%         2.0         1.25           RM21BR71E474KC01         X7R (EIA)         25         0.47∞p±10%         2.0         1.25 <td></td> <td>, ,</td> <td></td> <td></td> <td></td> <td></td> <td>0.80</td>		, ,					0.80
RM219R71H333KA01         X7R (EIA)         50         33000pF±10%         2.0         1.25           RM21BR71H473KA01         X7R (EIA)         50         47000pF±10%         2.0         1.25           RM21BR71H683KA01         X7R (EIA)         50         68000pF±10%         2.0         1.25           RM21BR71H104KA01         X7R (EIA)         50         0.1∞F±10%         2.0         1.25           RM21BR71H24KA01         X7R (EIA)         50         0.1∞F±10%         2.0         1.25           RM21BR71E104KA01         X7R (EIA)         50         22000pF±10%         2.0         1.25           RM21BR71E104KA01         X7R (EIA)         25         0.1∞F±10%         2.0         1.25           RM21BR71E154KA01         X7R (EIA)         25         0.1∞F±10%         2.0         1.25           RM21BR71E224KC01         X7R (EIA)         25         22000pF±10%         2.0         1.25           RM21BR71E334KC01         X7R (EIA)         25         0.33 ∞F±10%         2.0         1.25           RM21BR71E474KC01         X7R (EIA)         25         0.47∞F±10%         2.0         1.25           RM21BR71C474KC01         X7R (EIA)         16         0.68∞F±10%         2.0         1.25							0.80
RM21BR71H473KA01         X7R (EIA)         50         47000pF±10%         2.0         1.25           RM21BR71H683KA01         X7R (EIA)         50         68000pF±10%         2.0         1.25           RM21BR71H104KA01         X7R (EIA)         50         0.1∞F±10%         2.0         1.25           RM21BR71H154KA01         X7R (EIA)         50         0.15∞F±10%         2.0         1.25           RM21BR71H224KA01         X7R (EIA)         50         22000pF±10%         2.0         1.25           RM21BR71E104KA01         X7R (EIA)         25         0.1∞F±10%         2.0         1.25           RM21BR71E154KA01         X7R (EIA)         25         0.15∞F±10%         2.0         1.25           RM21BR71E24KC01         X7R (EIA)         25         22000pF±10%         2.0         1.25           RM21BR71E334KC01         X7R (EIA)         25         0.33 ∞F±10%         2.0         1.25           RM21BR71E474KC01         X7R (EIA)         25         0.47∞F±10%         2.0         1.25           RM21BR71C684KC01         X7R (EIA)         16         0.68∞F±10%         2.0         1.25           RM31BR71H334KA01         X7R (EIA)         50         0.33 ∞F±10%         3.2         1.6 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>0.80</td>							0.80
RM21BR71H683KA01         X7R (EIA)         50         68000pF±10%         2.0         1.25           RM21BR71H104KA01         X7R (EIA)         50         0.1αF±10%         2.0         1.25           RM21BR71H154KA01         X7R (EIA)         50         0.15αF±10%         2.0         1.25           RM21BR71H224KA01         X7R (EIA)         50         22000pF±10%         2.0         1.25           RM21BR71E104KA01         X7R (EIA)         25         0.1αF±10%         2.0         1.25           RM21BR71E154KA01         X7R (EIA)         25         0.15αF±10%         2.0         1.25           RM21BR71E224KC01         X7R (EIA)         25         22000pF±10%         2.0         1.25           RM21BR71E334KC01         X7R (EIA)         25         0.33 αF±10%         2.0         1.25           RM21BR71E474KC01         X7R (EIA)         25         0.47αF±10%         2.0         1.25           RM21BR71C474KC01         X7R (EIA)         16         0.47αF±10%         2.0         1.25           RM21BR71C105KA01         X7R (EIA)         16         1αF±10%         2.0         1.25           RM31BR71H334KA01         X7R (EIA)         50         0.33 αF±10%         3.2         1.6				·			
RM21BR71H104KA01         X7R (EIA)         50 $0.1αF±10%$ 2.0         1.25           RM21BR71H154KA01         X7R (EIA)         50 $0.15αF±10%$ 2.0         1.25           RM21BR71H224KA01         X7R (EIA)         50         22000pF±10%         2.0         1.25           RM21BR71E104KA01         X7R (EIA)         25 $0.1αF±10%$ 2.0         1.25           RM21BR71E154KA01         X7R (EIA)         25 $0.15αF±10%$ 2.0         1.25           RM21BR71E224KC01         X7R (EIA)         25         22000pF±10%         2.0         1.25           RM21BR71E334KC01         X7R (EIA)         25 $0.33αF±10%$ 2.0         1.25           RM21BR71E474KC01         X7R (EIA)         25 $0.47αF±10%$ 2.0         1.25           RM21BR71C474KC01         X7R (EIA)         16 $0.47αF±10%$ 2.0         1.25           RM21BR71C684KC01         X7R (EIA)         16 $0.68αF±10%$ 2.0         1.25           RM31BR71H334KA01         X7R (EIA)         50 $0.33αF±10%$ 3.2         1.6           RM31BR71H684KC01         X7R (EIA)         50 $0.47αF±10%$ 3.2		. ,		•			1.25
RM21BR71H154KA01         X7R (EIA)         50         0.15∞F±10%         2.0         1.25           RM21BR71H224KA01         X7R (EIA)         50         22000pF±10%         2.0         1.25           RM21BR71E104KA01         X7R (EIA)         25         0.1∞F±10%         2.0         1.25           RM21BR71E154KA01         X7R (EIA)         25         0.15∞F±10%         2.0         1.25           RM219R71E224KC01         X7R (EIA)         25         22000pF±10%         2.0         1.25           RM21BR71E334KC01         X7R (EIA)         25         0.33 ∞F±10%         2.0         1.25           RM21BR71E474KC01         X7R (EIA)         25         0.47∞F±10%         2.0         1.25           RM219R71C474KC01         X7R (EIA)         16         0.47∞F±10%         2.0         1.25           RM219R71C684KC01         X7R (EIA)         16         0.68∞F±10%         2.0         1.25           RM219R71C105KA01         X7R (EIA)         16         1∞F±10%         2.0         1.25           RM319R71H334KA01         X7R (EIA)         50         0.33 ∞F±10%         3.2         1.6           RM319R71E684KC01         X7R (EIA)         25         0.68∞F±10%         3.2         1.6							1.25
RM21BR71H224KA01         X7R (EIA)         50 $22000pF\pm10\%$ 2.0 $1.25$ RM21BR71E104KA01         X7R (EIA)         25 $0.1\alpha F\pm10\%$ 2.0 $1.25$ RM21BR71E154KA01         X7R (EIA)         25 $0.15\alpha F\pm10\%$ 2.0 $1.25$ RM219R71E224KC01         X7R (EIA)         25 $22000pF\pm10\%$ 2.0 $1.25$ RM21BR71E334KC01         X7R (EIA)         25 $0.33\alpha F\pm10\%$ 2.0 $1.25$ RM21BR71E474KC01         X7R (EIA)         25 $0.47\alpha F\pm10\%$ 2.0 $1.25$ RM219R71C474KC01         X7R (EIA)         16 $0.47\alpha F\pm10\%$ 2.0 $1.25$ RM219R71C684KC01         X7R (EIA)         16 $0.68\alpha F\pm10\%$ 2.0 $1.25$ RM21BR71C105KA01         X7R (EIA)         16 $1\alpha F\pm10\%$ 2.0 $1.25$ RM319R71H334KA01         X7R (EIA)         50 $0.33\alpha F\pm10\%$ 3.2 $1.6$ RM319R71E684KC01         X7R (EIA)         50 $0.47\alpha F\pm10\%$ 3.2 $1.6$ RM319R71E105KC01         X7R (EIA)         25 $0.68\alpha F\pm10$		, ,					1.25
RM21BR71E104KA01         X7R (EIA)         25 $0.1 \alpha F \pm 10\%$ 2.0         1.25           RM21BR71E154KA01         X7R (EIA)         25 $0.15 \alpha F \pm 10\%$ 2.0         1.25           RM219R71E224KC01         X7R (EIA)         25         22000pF $\pm 10\%$ 2.0         1.25           RM21BR71E334KC01         X7R (EIA)         25 $0.33 \alpha F \pm 10\%$ 2.0         1.25           RM21BR71E474KC01         X7R (EIA)         25 $0.47 \alpha F \pm 10\%$ 2.0         1.25           RM219R71C474KC01         X7R (EIA)         16 $0.47 \alpha F \pm 10\%$ 2.0         1.25           RM219R71C684KC01         X7R (EIA)         16 $0.68 \alpha F \pm 10\%$ 2.0         1.25           RM21BR71C105KA01         X7R (EIA)         16 $1 \alpha F \pm 10\%$ 2.0         1.25           RM319R71H334KA01         X7R (EIA)         50 $0.33 \alpha F \pm 10\%$ 3.2         1.6           RM319R71E684KC01         X7R (EIA)         50 $0.47 \alpha F \pm 10\%$ 3.2         1.6           RM319R71E105KC01         X7R (EIA)         25 $0.68 \alpha F \pm 10\%$ 3.2         1.6           RM319R71C105KC11         X7R (EIA)         25 $0$							1.25
RM21BR71E154KA01         X7R (EIA)         25 $0.15 \alpha F \pm 10\%$ 2.0         1.25           RM219R71E224KC01         X7R (EIA)         25         22000pF±10%         2.0         1.25           RM21BR71E334KC01         X7R (EIA)         25 $0.33 \alpha F \pm 10\%$ 2.0         1.25           RM21BR71E474KC01         X7R (EIA)         25 $0.47 \alpha F \pm 10\%$ 2.0         1.25           RM219R71C474KC01         X7R (EIA)         16 $0.47 \alpha F \pm 10\%$ 2.0         1.25           RM219R71C684KC01         X7R (EIA)         16 $0.68 \alpha F \pm 10\%$ 2.0         1.25           RM219R71C105KA01         X7R (EIA)         16 $1 \alpha F \pm 10\%$ 2.0         1.25           RM319R71H334KA01         X7R (EIA)         50 $0.33 \alpha F \pm 10\%$ 3.2         1.6           RM31MR71H474KA01         X7R (EIA)         50 $0.47 \alpha F \pm 10\%$ 3.2         1.6           RM319R71E684KC01         X7R (EIA)         25 $0.68 \alpha F \pm 10\%$ 3.2         1.6           RM319R71E105KC01         X7R (EIA)         25 $0.68 \alpha F \pm 10\%$ 3.2         1.6           RM319R71C105KC11         X7R (EIA)         25 $0.68 $				•			1.25
RM219R71E224KC01         X7R (EIA)         25         22000pF±10%         2.0         1.25           RM21BR71E334KC01         X7R (EIA)         25         0.33 $\alpha$ F±10%         2.0         1.25           RM21BR71E474KC01         X7R (EIA)         25         0.47 $\alpha$ F±10%         2.0         1.25           RM219R71C474KC01         X7R (EIA)         16         0.47 $\alpha$ F±10%         2.0         1.25           RM219R71C684KC01         X7R (EIA)         16         0.68 $\alpha$ F±10%         2.0         1.25           RM21BR71C105KA01         X7R (EIA)         16         1 $\alpha$ F±10%         2.0         1.25           RM319R71H334KA01         X7R (EIA)         50         0.33 $\alpha$ F±10%         3.2         1.6           RM31MR71H474KA01         X7R (EIA)         50         0.47 $\alpha$ F±10%         3.2         1.6           RM319R71E684KC01         X7R (EIA)         25         0.68 $\alpha$ F±10%         3.2         1.6           RM31MR71E105KC01         X7R (EIA)         25         1 $\alpha$ F±10%         3.2         1.6           RM319R71C105KC11         X7R (EIA)         16         1 $\alpha$ F±10%         3.2         1.6							1.25
RM21BR71E334KC01         X7R (EIA)         25 $0.33  \alpha F \pm 10\%$ 2.0         1.25           RM21BR71E474KC01         X7R (EIA)         25 $0.47  \alpha F \pm 10\%$ 2.0         1.25           RM219R71C474KC01         X7R (EIA)         16 $0.47  \alpha F \pm 10\%$ 2.0         1.25           RM219R71C684KC01         X7R (EIA)         16 $0.68  \alpha F \pm 10\%$ 2.0         1.25           RM21BR71C105KA01         X7R (EIA)         16 $1  \alpha F \pm 10\%$ 2.0         1.25           RM319R71H334KA01         X7R (EIA)         50 $0.33  \alpha F \pm 10\%$ 3.2         1.6           RM31MR71H474KA01         X7R (EIA)         50 $0.47  \alpha F \pm 10\%$ 3.2         1.6           RM319R71E684KC01         X7R (EIA)         25 $0.68  \alpha F \pm 10\%$ 3.2         1.6           RM31MR71E105KC01         X7R (EIA)         25 $1  \alpha F \pm 10\%$ 3.2         1.6           RM319R71C105KC11         X7R (EIA)         16 $1  \alpha F \pm 10\%$ 3.2         1.6		, ,					1.25
RM21BR71E474KC01         X7R (EIA)         25 $0.47 \alpha F \pm 10\%$ 2.0         1.25           RM219R71C474KC01         X7R (EIA)         16 $0.47 \alpha F \pm 10\%$ 2.0         1.25           RM219R71C684KC01         X7R (EIA)         16 $0.68 \alpha F \pm 10\%$ 2.0         1.25           RM21BR71C105KA01         X7R (EIA)         16 $1 \alpha F \pm 10\%$ 2.0         1.25           RM319R71H334KA01         X7R (EIA)         50 $0.33 \alpha F \pm 10\%$ 3.2         1.6           RM31MR71H474KA01         X7R (EIA)         50 $0.47 \alpha F \pm 10\%$ 3.2         1.6           RM319R71E684KC01         X7R (EIA)         25 $0.68 \alpha F \pm 10\%$ 3.2         1.6           RM31MR71E105KC01         X7R (EIA)         25 $1 \alpha F \pm 10\%$ 3.2         1.6           RM319R71C105KC11         X7R (EIA)         16 $1 \alpha F \pm 10\%$ 3.2         1.6		. ,					0.90
RM219R71C474KC01         X7R (EIA)         16 $0.47 \propto F \pm 10\%$ 2.0         1.25           RM219R71C684KC01         X7R (EIA)         16 $0.68 \propto F \pm 10\%$ 2.0         1.25           RM21BR71C105KA01         X7R (EIA)         16 $1 \propto F \pm 10\%$ 2.0         1.25           RM319R71H334KA01         X7R (EIA)         50 $0.33 \propto F \pm 10\%$ 3.2         1.6           RM31MR71H474KA01         X7R (EIA)         50 $0.47 \propto F \pm 10\%$ 3.2         1.6           RM319R71E684KC01         X7R (EIA)         25 $0.68 \propto F \pm 10\%$ 3.2         1.6           RM31MR71E105KC01         X7R (EIA)         25 $1 \propto F \pm 10\%$ 3.2         1.6           RM319R71C105KC11         X7R (EIA)         16 $1 \propto F \pm 10\%$ 3.2         1.6							1.25
RM219R71C684KC01         X7R (EIA)         16 $0.68 \alpha F \pm 10\%$ 2.0         1.25           RM21BR71C105KA01         X7R (EIA)         16 $1 \alpha F \pm 10\%$ 2.0         1.25           RM319R71H334KA01         X7R (EIA)         50 $0.33 \alpha F \pm 10\%$ 3.2         1.6           RM31MR71H474KA01         X7R (EIA)         50 $0.47 \alpha F \pm 10\%$ 3.2         1.6           RM319R71E684KC01         X7R (EIA)         25 $0.68 \alpha F \pm 10\%$ 3.2         1.6           RM31MR71E105KC01         X7R (EIA)         25 $1 \alpha F \pm 10\%$ 3.2         1.6           RM319R71C105KC11         X7R (EIA)         16 $1 \alpha F \pm 10\%$ 3.2         1.6		, ,					1.25
RM21BR71C105KA01         X7R (EIA)         16 $1 \infty F \pm 10\%$ 2.0         1.25           RM319R71H334KA01         X7R (EIA)         50 $0.33 \infty F \pm 10\%$ 3.2         1.6           RM31MR71H474KA01         X7R (EIA)         50 $0.47 \infty F \pm 10\%$ 3.2         1.6           RM319R71E684KC01         X7R (EIA)         25 $0.68 \infty F \pm 10\%$ 3.2         1.6           RM31MR71E105KC01         X7R (EIA)         25 $1 \infty F \pm 10\%$ 3.2         1.6           RM319R71C105KC11         X7R (EIA)         16 $1 \infty F \pm 10\%$ 3.2         1.6							0.90
RM319R71H334KA01         X7R (EIA)         50 $0.33 \text{ GF} \pm 10\%$ 3.2         1.6           RM31MR71H474KA01         X7R (EIA)         50 $0.47 \text{ GF} \pm 10\%$ 3.2         1.6           RM319R71E684KC01         X7R (EIA)         25 $0.68 \text{ GF} \pm 10\%$ 3.2         1.6           RM31MR71E105KC01         X7R (EIA)         25 $1 \text{ GF} \pm 10\%$ 3.2         1.6           RM319R71C105KC11         X7R (EIA)         16 $1 \text{ GF} \pm 10\%$ 3.2         1.6							0.90
RM31MR71H474KA01         X7R (EIA)         50 $0.47 \propto F \pm 10\%$ 3.2         1.6           RM319R71E684KC01         X7R (EIA)         25 $0.68 \propto F \pm 10\%$ 3.2         1.6           RM31MR71E105KC01         X7R (EIA)         25 $1 \propto F \pm 10\%$ 3.2         1.6           RM319R71C105KC11         X7R (EIA)         16 $1 \propto F \pm 10\%$ 3.2         1.6							1.25
RM319R71E684KC01       X7R (EIA)       25       0.68∞F±10%       3.2       1.6         RM31MR71E105KC01       X7R (EIA)       25       1∞F±10%       3.2       1.6         RM319R71C105KC11       X7R (EIA)       16       1∞F±10%       3.2       1.6							0.90
RM31MR71E105KC01       X7R (EIA)       25       1 $\alpha$ F ±10%       3.2       1.6         RM319R71C105KC11       X7R (EIA)       16       1 $\alpha$ F ±10%       3.2       1.6		, ,					1.15
<b>RM319R71C105KC11</b> X7R (EIA) 16 1∝F ±10% 3.2 1.6							0.90
	71E105KC01					1.6	1.15
RM31MR71C155KC11 X7R (EIA) 16 1.5xF ±10% 3.2 1.6	71C105KC11	X7R (EIA)		1∝F ±10%			0.90
	71C155KC11	X7R (EIA)	16	1.5∝F ±10%	3.2	1.6	1.15
<b>RM31MR71C225KA35</b> X7R (EIA) 16 2.2¢F ±10% 3.2 1.6	71C225KA35	X7R (EIA)	16	2.2∝F ±10%	3.2	1.6	1.15



Part Number	TC Code	Rated Voltage (Vdc)	Capacitance*	Length L (mm)	Width W (mm)	Thickness T (mm)
GRM319R71A225KA01	X7R (EIA)	10	2.2∝F ±10%	3.2	1.6	0.90
GRM32NR71H684KA01	X7R (EIA)	50	0.68∝F±10%	3.2	2.5	1.35
GRM32RR71H105KA01	X7R (EIA)	50	1∝F ±10%	3.2	2.5	1.80
GRM32RR71E225KC01	X7R (EIA)	25	2.2∝F ±10%	3.2	2.5	1.80
GRM32MR71C225KC01	X7R (EIA)	16	2.2∝F ±10%	3.2	2.5	1.15
GRM32NR71C335KC01	X7R (EIA)	16	3.3∝F ±10%	3.2	2.5	1.35
GRM32RR71C475KC01	X7R (EIA)	16	4.7∝F ±10%	3.2	2.5	1.80
GRM43ER71H225KA01	X7R (EIA)	50	2.2∞F ±10%	4.5	3.2	2.50
GRM55RR71H105KA01	X7R (EIA)	50	1∝F ±10%	5.7	5.0	1.80
GRM55RR71H155KA01	X7R (EIA)	50	1.5∝F ±10%	5.7	5.0	1.80
GRM155F51H222ZA01	Y5V (EIA)	50	2200pF +80%, -20%	1.0	0.5	0.50
GRM155F51H472ZA01	Y5V (EIA)	50	4700pF +80%, -20%	1.0	0.5	0.50
GRM155F51H103ZA01	Y5V (EIA)	50	10000pF +80%, -20%	1.0	0.5	0.50
GRM155F51E223ZA01	Y5V (EIA)	25	22000pF +80%, -20%	1.0	0.5	0.50
GRM155F51C473ZA01	Y5V (EIA)	16	47000pF +80%, -20%	1.0	0.5	0.50
GRM155F51C104ZA01	Y5V (EIA)	16	10000pF +80%, -20%	1.0	0.5	0.50
GRM188F51H103ZA01	Y5V (EIA)	50	10000pF +80%, -20%	1.6	0.8	0.80
GRM188F51H223ZA01	Y5V (EIA)	50	22000pF +80%, -20%	1.6	0.8	0.80
GRM188F51H473ZA01	Y5V (EIA)	50	47000pF +80%, -20%	1.6	0.8	0.80
GRM188F51H104ZA01	Y5V (EIA)	50	10000pF +80%, -20%	1.6	0.8	0.80
GRM188F51E104ZA01	Y5V (EIA)	25	10000pF +80%, -20%	1.6	0.8	0.80
GRM188F51C224ZA01	Y5V (EIA)	16	22000pF +80%, -20%	1.6	0.8	0.80
GRM188F51C474ZA01	Y5V (EIA)	16	0.47¢F +80%, -20%	1.6	0.8	0.80
GRM188F51A474ZC01	Y5V (EIA)	10	0.47¢F +80%, -20%	1.6	0.8	0.80
GRM188F51A105ZA01	Y5V (EIA)	10	1αF +80%, -20%	1.6	0.8	0.80
GRM219F51H104ZA01	Y5V (EIA)	50 50	10000pF +80%, -20%	2.0 2.0	1.25 1.25	0.90 1.25
GRM21BF51H224ZA01	Y5V (EIA)		22000pF +80%, -20%			
GRM219F51E224ZA01	Y5V (EIA)	25	22000pF +80%, -20%	2.0	1.25	0.90
GRM21BF51E474ZA01	Y5V (EIA)	25	0.47∝F +80%, -20%	2.0	1.25	1.25
GRM219F51E105ZA01	Y5V (EIA)	25	1∝F +80%, -20%	2.0	1.25	0.90
GRM21BF51E225ZA01	Y5V (EIA)	25	2.2∝F +80%, -20%	2.0	1.25	1.25
GRM219F51C105ZA01	Y5V (EIA)	16	1αF +80%, -20%	2.0	1.25	0.90
GRM21BF51C225ZA01	Y5V (EIA)	16	2.2¢F +80%, -20%	2.0	1.25	1.25
GRM219F51A105ZA01	Y5V (EIA)	10	1∝F +80%, -20%	2.0	1.25	0.90
GRM21BF51A225ZA01	Y5V (EIA)	10	2.2∝F +80%, -20%	2.0	1.25	1.25
GRM21BF51A475ZA01	Y5V (EIA)	10	4.7∝F +80%, -20%	2.0	1.25	1.25
GRM31MF51H474ZA01	Y5V (EIA)	50	0.47∝F +80%, -20%	3.2	1.6	1.15
GRM31MF51E105ZA01	Y5V (EIA)	25	1∝F +80%, -20%	3.2	1.6	1.15
GRM31MF51E475ZA01	Y5V (EIA)	25	4.7αF +80%, -20%	3.2	1.6	1.15
SRM319F51C105ZA01	Y5V (EIA)	16	1αF +80%, -20%	3.2	1.6	0.90
SRM31MF51C225ZA01	Y5V (EIA)	16	2.2¢F +80%, -20%	3.2	1.6	1.15
GRM31MF51C475ZA12	Y5V (EIA)	16	4.7∝F +80%, -20%	3.2	1.6	1.15
GRM319F51A225ZA01	Y5V (EIA)	10	2.2∝F +80%, -20%	3.2	1.6	0.90
GRM31MF51A475ZA01	Y5V (EIA)	10	4.7∝F +80%, -20%	3.2	1.6	1.15
RM31MF51A106ZA01	Y5V (EIA)	10	10∝F +80%, -20%	3.2	1.6	1.15
RM31MF50J106ZA01	Y5V (EIA)	6.3	10∝F +80%, -20%	3.2	1.6	1.15
GRM32RF51H105ZA01	Y5V (EIA)	50	1¤F +80%, -20%	3.2	2.5	1.80
SRM329F51E475ZA01	Y5V (EIA)	25	4.7¢F +80%, -20%	3.2	2.5	0.90
RM32NF51E106ZA01	Y5V (EIA)	25	10∝F +80%, -20%	3.2	2.5	1.35
RM32NF51C106ZA01	Y5V (EIA)	16	10∝F +80%, -20%	3.2	2.5	1.35
RM188E41H103MA01	Z5U (EIA)	50	10000pF±20%	1.6	0.8	0.80
GRM188E41H223MA01	Z5U (EIA)	50	22000pF±20%	1.6	0.8	0.80
GRM216E41H473MA01	Z5U (EIA)	50	47000pF±20%	2.0	1.25	0.60
GRM219E41H104MA01	Z5U (EIA)	50	10000pF±20%	2.0	1.25	0.90
GRM319E41H224MA01	Z5U (EIA)	50	22000pF±20%	3.2	1.6	0.90

### ■ Specifications and Test Methods

		Specifi	cations	
No.	Item	Temperature Compensating Type	High Dielectric Type	Test Method
1	Operating Temperature Range	–55 to +125℃	B1, B3, F1: -25°C to +85°C R1, R7: -55°C to +125°C E4: +10°C to +85°C F5: -30°C to +85°C	Reference Temperature : 25°C (2Δ, 3Δ, 4Δ, B1, B3, F1, R1 : 20°C)
2	Rated Voltage	See the previous pages		The rated voltage is defined as the maximum voltage which may be applied continuously to the capacitor.  When AC voltage is superimposed on DC voltage, V <sup>p,p</sup> or V <sup>op</sup> , whichever is larger, should be maintained within the rated voltage range.
3	Appearance	No defects or abnormalities		Visual inspection
4	Dimensions	Within the specified dimensions		Using calipers
5	Dielectric Strength	No defects or abnormalities		No failure should be observed when 300% of the rated voltage (temperature compensating type) or 250% of the rated voltage (high dielectric constant type) is applied between the terminations for 1 to 5 seconds, provided the charge/discharge current is less than 50mA.
6	Insulation Resistance	C≤0.047μF : More than 10,0000 C>0.047μF : 500Ω • F	MΩ C : Nominal Capacitance	The insulation resistance should be measured with a DC voltage not exceeding the rated voltage at 20°C/25°C and 75%RH max. and within 2 minutes of charging, provided the charge/discharge current is less than 50mA.
7	Capacitance	Within the specified tolerance		The capacitance/D.F. should be measured at 20°C/25°C at the
8	Q/ Dissipation Factor (D.F.)	30pF and over : Q≥1000 30pF and below : Q≥400+20C C : Nominal Capacitance (pF)	[B1, B3, R1, R6, R7, E4] W.V.: 25Vmin.: 0.025max. W.V.: 16/10V: 0.035max. W.V.: 6.3V/4V : 0.05max. (C<3.3μF) : 0.1max. (C≧3.3μF)  [F1, F5] W.V.: 25Vmin. : 0.05max. (C<0.1μF) : 0.09max. (C≥0.1μF) W.V.: 16V/10V: 0.125max. W.V.: 6.3V: 0.15max.	Char.



			Sanait	fications					
NI-	14.0		i i	fications			T4 M-	41	
No.	Ite	em	Temperature Compensating Type	High Dielectric Type			Test Me	etnoa	
		No bias	Within the specified tolerance (Table A-1)	B1, B3 : Within±10% (-25°C to +85°C) R1, R7 : Within±15% (-55°C to +125°C) R6 : Within±15% (-55°C to +85°C) E4 : Within +22/-56% (+10°C to +85°C) F1 : Within +30/-80% (-25°C to +85°C) F5 : Within +22/-82% (-30°C to +85°C)	each speci (1)Temper The tempe measured When cycli 5 (5C: +2! coeffs: +4' should be v coefficient The capaci between th	ified temp rature Cor in step 3 ing the te 5°C to +1: 25°C to +2 within the and capa itance dri ne maximi	o. stage.  mpensating Ty efficient is det as a reference 25°C/∆C: +20 \$5°C/+20°C to e specified tole acitance chang ft is caluculate um and minim	ype termind u e. quentially c to +1 +85°C) t erance fo ge as Tai ed by div num mea	iding the differences sured values in the
							ne cap. value		
		50% of		B1: Within +10/-30%		ep 1		emperat	, ,
		the Rated		R1 : Within +15/-40%		2			nperature±2 5±3 (for other TC)
		Voltage		F1 : Within +30/–95%		3			nperature±2
						4			±3 (for other TC)
				/		5			nperature±2
							Constant Type		iperature±2
9	Capacitance Temperature Characteristics				The ranges of capacitance change compared with the value over the temperature ranges shown in the table be within the specified ranges.* In case of applying voltage, the capacitance change s measured after 1 more min. with applying voltage in equilibration of each temp. stage.			in the table should ce change should be	
					Step	Ten	nperature (°C)	)	Applying Voltage (V)
					_ 1	Refere	nce Tempere	ture±2	
		Capacitance Drift	Within ±0.2% or ±0.05pF (Whichever is larger.) *Not apply to 1X/25V		2	-25±	:3 (for R1, R7 ±3 (for B1, B3 (for F5)/10±3	, F1)	No bigo
				*Initial measurement for high	3	Refere	nce Temperet	ture±2	No bias
				dielectric constant type Perform a heat treatment at 150+0/–10°C for one hour	4		5±3 (for R1, R :3 (for B1, B3, F1, F5, E4)		
				and then set for 48±4 hours at room temperature.	5	Refere	nce Tempere	ture±2	
				Perform the initial	6		55±3 (for R1)		
				measurement.		_	5±3 (for B1, F	-	50% of the rated
					7	_	nce Temperet		voltage
					8		25±3 (for R1) 5±3 (for B1, F		
			No removal of the terminations	or other defect should occur	Fig. 1a usi parallel wit The solder reflow metl soldering is	ng an eut th the test ring should hod and s s uniform	ectic solder. T i jig for 10±1 s d be done eith should be con	Then app sec. her with a ducted w efects su	epoxy board) shown in oly 10N* force in an iron or using the with care so that the ich as heat shock.
	Adhesive	Strength	<u> </u>						(in mm)
10	Adhesive of Termin	_			Ty		a	b	C O O
	or remini	dion			_GR□03 GR□15		0.3	0.9 1.5	
				Solder resist	GRM18		1.0	3.0	
				Baked electrode or	GRM21		1.2	4.0	
				copper foil	GRM31	1	2.2	5.0	
			Fig. 1a		_GRM32		2.2	5.0	
					GRM43		3.5	7.0	
					_GRM55	5	4.5	8.0	5.6

Continued on the following page.  $\begin{tabular}{|c|c|c|c|} \hline \end{tabular}$ 

		·	Specifi	ications				
No.	lt€	em	Temperature Compensating Type	High Dielectric Type		Test Met	thod	
		Appearance	No defects or abnormalities	ı				
		Capacitance	Within the specified tolerance					
11	Vibration Resistance	Q/D.F.	30pF and over : Q≥1000 30pF and below : Q≥400+20C C : Nominal Capacitance (pF)	[B1, B3, R1, R6, R7, E4] W.V.: 25Vmin.: 0.025max. W.V.: 16/10V: 0.035max. W.V.: 6.3V/4V : 0.05max. (C<3.3μF) : 0.1max. (C≥3.3μF)  [F1, F5] W.V.: 25Vmin. : 0.05max. (C<0.1μF) : 0.09max. (C≥0.1μF) W.V.: 16V/10V: 0.125max. W.V.: 6.3V: 0.15max.	The capacitor should be subjected to a simple harmonic maken having a total amplitude of 1.5mm, the frequency being valuniformly between the approximate limits of 10 and 55Hz. frequency range, from 10 to 55Hz and return to 10Hz, sho be traversed in approximately 1 minute. This motion should applied for a period of 2 hours in each 3 mutually perpend directions (total of 6 hours).			
			No crack or marked defect shou	ıld occur				
12	12 Deflection		R230 Capacitance n 45 Fig. 3a	Type GR□03 GR□15 GRM18 GRM21 GRM31	n Fig. 3a for 5±1: an iron or using the care so that the is heat shock.  b  100  Fig. 2  a  0.3  0.4  1.0  1.2  2.2	a t: 1.6mm (GF 0.9 1.5 3.0 4.0 5.0	2003/15:t:0.8mm)  C 0.3 0.5 1.2 1.65 2.0	
					GRM32	2.2	5.0	2.9
					GRM43 GRM55	3.5 4.5	7.0	3.7 5.6
					Ortimoo	1.0	0.0	(in mm)
13	Solderab Terminati		75% of the terminations are to be continuously  The measured and observed ch	ŕ	Immerse the cap rosin (JIS-K-5902 Preheat at 80 to After preheating, 2±0.5 seconds a	2) (25% rosin in w 120℃ for 10 to 30 immerse in an eu	veight propo seconds.	ol (JIS-K-8101) and otion) .
			specifications in the following ta	ble				
		Appearance	No defects or abnormalities					
		Capacitance Change	Within ±2.5% or ±0.25pF (Whichever is larger)	B1, B3, R1, R6, R7 : Within ±7.5% F1, F5, E4 : Within ±20%	Preheat the capa Immerse the cap for 10±0.5 secon	acitor in an eutec	tic solder s	olution at 270±5℃
14	Resistance to Soldering Heat	Q/D.F.	30pF and over : Q≥1000 30pF and below : Q≥400+20C C : Nominal Capacitance (pF)	[B1, B3, R1, R6, R7, E4] W.V.: 25Vmin.: 0.025max. W.V.: 16/10V: 0.035max. W.V.: 6.3V/4V : 0.05max. (C<3.3μF) : 0.1max. (C≧3.3μF)  [F1, F5] W.V.: 25Vmin. : 0.05max. (C<0.1μF) : 0.09max. (C≥0.1μF) W.V.: 16V/10V: 0.125max. W.V.: 6.3V: 0.15max.		npensating tyoe) nen measure. nent for high diele eatment at 150+ temperature for 4 Il measurement.	or 48±4 ho	ours (high dielectric ant type one hour and
				I		170 € 10 2007	<u> </u>	1 111111.
		I.R.	More than $10,000 \mathrm{M}\Omega$ or $500\Omega$	F (Whichever is smaller)				
		Dielectric Strength	No defects					

		Specifi	cations						
No. Ite	em	Temperature Compensating Type	High Dielectric Type		Tes	t Method	i		
		The measured and observed ch specifications in the following ta							
	Appearance	No defects or abnormalities							
	Capacitance Change	Within ±2.5% or ±0.25pF (Whichever is larger)	B1, B3, R1, R6, R7 : Within ±7.5% F1, F5, E4 : Within ±20%	Fix the capacit manner and ur Perform the fiv shown in the fo	der the same e cycles accor	condition	s as (10).	atments	
			[B1, B3, R1, R6, R7, E4] W.V. : 25Vmin. : 0.025max. W.V. : 16/10V : 0.035max.	Set for 24±2 h hours (high die measure.	ours (temperat lectric constan	t type) a	t room tempera	iture, the	
5 Temperature		30pF and over : Q≧1000	W.V.: 6.3V/4V	Step	1	2	3	4	
Cycle	Q/D.F.	30pF and below : Q≧400+20C	: 0.05max. (C<3.3µF) : 0.1max. (C≧3.3µF) [F1, F5]	Temp. (℃)	Min. Operating Temp.+0/-3	Room Temp.	Max. Operating Temp.+3/-0	Room Temp.	
		C : Nominal Capacitance (pF)	W.V. : 25Vmin.	Time (min.)	30±3	2 to 3	30±3	2 to 3	
	LD		: 0.05max. (C<0.1µF) : 0.09max. (C≧0.1µF) W.V. : 16V/10V : 0.125max. W.V. : 6.3V : 0.15max.	<ul> <li>Initial measurement for high dielectric constant type</li> <li>Perform a heat treatment at 150+0/−10°C for one hour and then set at room temperature for 48±4 hours.</li> <li>Perform the initial measurement.</li> </ul>					
	I.R.	More than $10,000 \text{M}\Omega$ or $500 \Omega$	F (Whichever is smaller)						
	Dielectric Strength	No defects							
		The measured and observed ch specifications in the following ta							
	Appearance	No defects or abnormalities							
	Capacitance Change	Within ±5% or ±0.5pF (Whichever is larger)	B1, B3, R1, R6, R7, C8 : Within ±12.5% F1, F5 : Within ±30%						
Humidity 16 (Steady State)		30pF and over : Q≥350 10pF and over 30pF and below : Q≥275+2.5C	[B1, B3, R1, R6, R7, E4] W.V.: 25Vmin.: 0.05max. W.V.: 16/10V: 0.05max. W.V.: 6.3V/4V : 0.075max. (C<3.3µF) : 0.125max. (C≥3.3µF)	temperature, then measure.			ensating		
State)	O/D E		(54 55)						
State)	Q/D.F.	10pF and below : Q≥200+10C C : Nominal Capacitance (pF)	[F1, F5] W.V.: 25Vmin. : 0.075max. (C<0.1μF) : 0.125max. (C≥0.1μF) W.V.: 16V/10V: 0.15max. W.V.: 6.3V: 0.2max.						

Continued on the following page.  $\begin{tabular}{|c|c|c|c|} \hline \end{tabular}$ 

		Specifi	ications	
No. I	tem	Temperature Compensating Type	High Dielectric Type	Test Method
		The measured and observed ch specifications in the following ta	-	
	Appearance	No defects or abnormalities		
	Capacitance Within ±7.5% or ±0.75pF Change (Whichever is larger)		B1, B3, R1, R6, R7 : Within ±12.5% F1, F5, E4: Within ±30% [W.V.: 10Vmax.] F1, F5: Within +30/-40%	Apply the rated voltage at 40±2℃ and 90 to 95% humidity for 500±12 hours. Remove and set for 24±2 hours (temperature
17 Humidity Load	Q/D.F.	30pF and over : Q≥200 30pF and below : Q≥100+10C/3 C : Nominal Capacitance (pF)	[B1, B3, R1, R6, R7, E4] W.V.: 25Vmin.: 0.05max. W.V.: 16/10V: 0.05max. W.V.: 6.3V : 0.075max. (C<3.3μF) : 0.125max. (C≥3.3μF)  [F1, F5] W.V.: 25Vmin. : 0.075max. (C<0.1μF) : 0.125max. (C≥0.1μF) W.V.: 16V/10V: 0.15max.	<ul> <li>compensating type) or 48±4 hours (high dielectric constant type) at room temprature, then muasure. The charge/discharge current is less than 50mA.</li> <li>Initial measurement for F1, F5/10V max.         Apply the rated DC voltage for 1 hour at 40±2°C.         Remove and set for 48±4 hours at room temperature.     </li> <li>Perform initial measurement.</li> </ul>
	I.R.	More than $500\text{M}\Omega$ or $25\Omega \cdot \text{F}$ (V	Vhichever is smaller)	
		The measured and observed chapecifications in the following ta	•	
	Appearance	No defects or abnormalities		
	Capacitance Change	Within ±3% or ±0.3pF (Whichever is larger)	B1, B3, R1, R6, R7 : Within ±12.5% F1, F5, E4: Within ±30% [Exept 10Vmax. and. C≥1.0µF] F1, F5: Within +30/-40% [10Vmax. and. C≥1.0µF]	Apply 200% of the rated voltage at the maximum operating temperature ±3°c for 1000±12 hours.  Set for 24±2 hours (temperature compensating type) or 48±4 hours (high dielectric constant type) at room temperature, then mea
High 18 Temperatur Load	Q/D.F.	30pF and over : Q≥350 10pF and over 30pF and below : Q≥275+2.5C 10pF and below : Q≥200+10C C : Nominal Capacitance (pF)	[B1, B3, R1, R6, R7, E4] W.V.: 25Vmin.: 0.04max. W.V.: 16/10V: 0.05max. W.V.: 6.3V : 0.075max.(C<3.3μF) : 0.125max.(C≧3.3μF)  [F1, F5] W.V.: 25Vmin. : 0.075max.(C<0.1μF) : 0.125max.(C≧0.1μF) W.V.: 16V/10V: 0.15max. W.V.: 6.3V: 0.2max.	temperature, then measure. The charge/discharge current is less than 50mA.  •Initial measurement for high dielectric constant type. Apply 200% of the rated DC voltage at the maximun operating temperature ±3°C for one hour. Remove and set for 48±4 hours at room temperature. Perform initial measurement.
	I.R.	More than 1,000MΩ or 50Ω•F (	Whichover is smaller)	I and the second



Continued from the preceding page.

Table A-1

(1)

		Capacitance Change from 25℃ (%)						
Char.	Nominal Values (ppm/℃)*1	_	-55		-30		10	
		Max.	Min.	Max.	Min.	Max.	Min.	
5C	0± 30	0.58	-0.24	0.40	-0.17	0.25	-0.11	
6C	0± 60	0.87	-0.48	0.59	-0.33	0.38	-0.21	
6P	-150± 60	2.33	0.72	1.61	0.50	1.02	0.32	
6R	-220± 60	3.02	1.28	2.08	0.88	1.32	0.56	
6S	-330± 60	4.09	2.16	2.81	1.49	1.79	0.95	
6T	-470± 60	5.46	3.28	3.75	2.26	2.39	1.44	
7U	-750±120	8.78	5.04	6.04	3.47	3.84	2.21	
1X	+350 to -1000	_	_	_	_	_	_	

<sup>\*1</sup>Nominal values denote the temperature coefficient within a range of 25℃ to 125℃ (for ΔC)/85℃ (for other TC).

(2)

			(	Capacitance Cha	ange from 20℃ (%)	)	
Char.	Nominal Values (ppm/℃)*2	-	-55	<b>-</b> 25		<b>—10</b>	
	-	Max.	Min.	Max.	Min.	Max.	Min.
2C	0± 60	0.82	-0.45	0.49	-0.27	0.33	-0.18
3C	0±120	1.37	-0.90	0.82	-0.54	0.55	-0.36
4C	0±250	2.56	-1.88	1.54	-1.13	1.02	-0.75
2P	-150± 60	_	_	1.32	0.41	0.88	0.27
3P	-150±120	_	_	1.65	0.14	1.10	0.09
4P	-150±250	_	_	2.36	-0.45	1.57	-0.30
2R	-220± 60	_	_	1.70	0.72	1.13	0.48
3R	-220±120	_	_	2.03	0.45	1.35	0.30
4R	-220±250	_	_	2.74	-0.14	1.83	-0.09
2S	-330± 60	_	_	2.30	1.22	1.54	0.81
3S	-330±120	_	_	2.63	0.95	1.76	0.63
4S	-330±250	-	_	3.35	0.36	2.23	0.24
2T	-470± 60	_	_	3.07	1.85	2.05	1.23
3T	-470±120	_	_	3.40	1.58	2.27	1.05
4T	-470±250	_	_	4.12	0.99	2.74	0.66
3U	-750±120	_	_	4.94	2.84	3.29	1.89
4U	-750±250	_	_	5.65	2.25	3.77	1.50

<sup>\*2</sup>Nominal values denote the temperature coefficient within a range of 20°C to 125°C (for ΔC)/85°C (for other TC).

# Monolithic Ceramic Capacitors GR\_R6/R7/F5/E4 (X5R/X7R/Y5V/Z5U)

# High Dielectric Constant Type 100V

Part Number	TC Code	Rated Voltage (Vdc)	Capacitance*	Length L (mm)	Width W (mm)	Thickness T (mm)
GRM188R72A222KD01	X7R (EIA)	100	2200pF±10%	1.6	0.8	0.80
GRM188R72A332KD01	<b>GRM188R72A332KD01</b> X7R (EIA) 100		3300pF±10%	1.6	0.8	0.80
GRM219R72A472KA01	X7R (EIA)	100	4700pF±10%	2.0	1.25	0.90
GRM219R72A682KA01	X7R (EIA)	100	6800pF±10%	2.0	1.25	0.90
GRM21BR72A103KA01	X7R (EIA)	100	10000pF±10%	2.0	1.25	1.25
GRM31MR72A333KA01	X7R (EIA)	100	33000pF±10%	3.2	1.6	1.15
GRM31MR72A473KA01	X7R (EIA)	100	47000pF±10%	3.2	1.6	1.15
GRM32NR72A683KA01	X7R (EIA)	100	68000pF±10%	3.2	2.5	1.35
GRM32NR72A104KA01	X7R (EIA)	100	0.1∝F±10%	3.2	2.5	1.35
GRM43RR72A154KA01	X7R (EIA)	100	0.15∝F±10%	4.5	3.2	1.80
GRM43RR72A224KA01	X7R (EIA)	100	22000pF±10%	4.5	3.2	1.80
GRM43DR72A474KA01	X7R (EIA)	100	0.47∝F±10%	4.5	3.2	2.00
GRM55DR72A105KA01	X7R (EIA)	100	1∝F ±10%	5.7	5.0	2.00
GRM188F52A472ZD01	Y5V (EIA)	100	4700pF +80%, -20%	1.6	0.8	0.80
GRM32NF52A104ZA01	Y5V (EIA)	100	10000pF +80%, -20%	3.2	2.5	1.35
GRM55RF52A474ZA01	Y5V (EIA)	100	0.47∝F +80%, -20%	5.7	5.0	1.80

# Monolithic Ceramic Capacitors GR\_R6/R7/F5/E4 (X5R/X7R/Y5V/Z5U)

## Thin Layer Large-Capacitance type

Part Number		Dime	nsions (mr	m)		
Fait Nullibei	L	W	T	e min.	g min.	_
GRM033	0.6 ±0.03	0.3 ±0.03	0.3 ±0.03	0.1 to 0.2	0.2	<b>S</b>
GRM155	1.0 ±0.05	0.5 ±0.05	0.5 ±0.05	0.15 to 0.3	0.4	2 2 2 2
GRM185	1.6 ±0.1	0.8 ±0.1	0.5 +0/-0.2	0.2 to 0.5	0.5	
GRM188	1.6 ±0.1	0.8 ±0.1	0.8 ±0.1	0.2 to 0.5	0.5	
GRM216			0.6 ±0.1			
GRM219	2.0 ±0.1	1.25 ±0.1	0.85 ±0.1	0.2 to 0.7	0.7	
GRM21B			1.25 ±0.1			
GRM316			0.6 ±0.1			
GRM319	3.2 ±0.15	1.6 ±0.15	0.85 ±0.1	0.3 to 0.8	1.5	e g e
GRM31M			1.15 ±0.1	0.3 10 0.6	1.5	
GRM31C	3.2 ±0.2	1.6 ±0.2	1.6 ±0.2			
GRM32D	3.2 ±0.3	2.5 ±0.2	2.0 ±0.2	0.3	1.0	
GRM32E	3.2 ±0.3	2.0 ±0.2	2.5 ±0.2	0.5	1.0	
GRM43D			2.0 ±0.2			
GRM43E	4.5 ±0.4	3.2 ±0.3	2.5 ±0.2	0.3	2.0	
GRM43S			2.8 ±0.2			L H W
GRM55F	5.7 ±0.4	5.0 ±0.4	3.2 ±0.2	0.3	2.0	

Part Number	TC Code	Rated Voltage (Vdc)	Capacitance*	Length L (mm)	Width W (mm)	Thickness T (mm)
GRM155R60J154KE01	X5R (EIA)	6.3	0.15∝F±10%	1.0	0.5	0.50
GRM155R60J224KE01	X5R (EIA)	6.3	22000pF±10%	1.0	0.5	0.50
GRM155R60J334KE01	X5R (EIA)	6.3	0.33 ∝F±10%	1.0	0.5	0.50
GRM155R60J474KE19	X5R (EIA)	6.3	0.47∝F±10%	1.0	0.5	0.50
GRM188R60J225KE01	X5R (EIA)	6.3	2.2∝F ±10%	1.6	0.8	0.80
GRM219R60J475KE01	X5R (EIA)	6.3	4.7∝F ±10%	2.0	1.25	0.90
GRM21BR60J106KE01	X5R (EIA)	6.3	10∞F ±10%	2.0	1.25	1.25
GRM21BR60J106ME01	X5R (EIA)	6.3	10∝F ±20%	2.0	1.25	1.25
GRM32DR60J226KA01	X5R (EIA)	6.3	22∝F ±10%	3.2	2.5	2.00
GRM32ER60J476ME20	X5R (EIA)	6.3	47∝F ±20%	3.2	2.5	2.50
GRM43SR60J107ME20	X5R (EIA)	6.3	100∝F ±20%	4.5	3.2	2.80
GRM55FR60J107KA01	X5R (EIA)	6.3	100∝F ±10%	5.7	5.0	3.20
GRM55FR60J107MA01	X5R (EIA)	6.3	100∝F ±20%	5.7	5.0	3.20
GRM21BF50J106ZE01	Y5V (EIA)	6.3	10∝F +80%, -20%	2.0	1.25	1.25

No.	Ite	em	Specifications		Test Method				
1	Operating Tempera Range		B1, B3, F1 : -25°C to +85°C R6 : -55°C to +85°C F5 : -30°C to +85°C C8 : -55°C to +105°C, C7 : -55°C to +125°C	Reference Temperature : 25℃ (B1, B3, F1 : 20℃)					
2	Rated Vo	ltage	See the previous pages	The rated voltage is defined as the maximum voltage wh may be applied continuously to the capacitor. When AC voltage is superimposed on DC voltage, V <sup>p,p</sup> o whichever is larger, should be maintained within the rate voltage range.					
3	Appearar	nce	No defects or abnormalities	Visual insp	ection				
4	Dimensio		Within the specified dimensions	Using calip	ers				
5		: Strength	No defects or abnormalities	No failure should be observed when 250% of the rated is applied between the terminations for 1 to 5 seconds, provided the charge/discharge current is less than 50m/					
6	Insulation Resistan		More than 50Ω • F	The insulation resistance should be measured with a DC voltanot exceeding the rated voltage at Reference Temperature at 75%RH max. and within 1 minutes of charging, provided the charge/discharge current is less than 50mA.					
			Within the specified tolerance	The capacitance should be measured at Reference Temperature at the frequency and voltage shown in the table.					
7	' Capacitance		*Table 1  GRM155 B3/R6 1A 124 to 224  GRM185 B3/R6 1A 105  GRM188 B3/R6 1C/1A 225  GRM219 B3/R6 1A 475  GRM21B B3/R6 1C/1A 106	C≦10 C≤10 C>10	apacitance Frequency μF (10V min.)*¹ 1±0.1kHz μF (6.3V max.) 1±0.1kHz μF 120±24Hz wever the Voltage is 0.5+/-0.1 ns on the left side.	1.0±0.2Vrms 0.5±0.1Vrms 0.5±0.1Vrms			
	B Dissipation Factor (D.F.)		1, B3, R6, C7, C8 : 0.1 max.  The D.F. should be measured at Reference Temple 1, F5 : 0.2 max.  The D.F. should be measured at Reference Temple 1, F5 : 0.2 max.						
8			*Table 1 GRM155 B3/R6 1A 124 to 224 GRM185 B3/R6 1A 105 GRM188 B3/R6 1C/1A 225 GRM219 B3/R6 1A 475 GRM21B B3/R6 1C/1A 106	C≦10 C≤10 C>10	apacitance Frequency μF (10V min.)*1 1±0.1kHz μF (6.3V max.) 1±0.1kHz μF 120±24Hz wever the Voltage is 0.5+/-0.1 ns on the left side.	1.0±0.2Vrms 0.5±0.1Vrms 0.5±0.1Vrms			
		No bias	B1, B3 : Within +/-10% (-25°c to +85°c) F1 : Within +30/-80% (-25°c to +85°c) R6 : Within +/-15% (-55°c to +85°c) F5 : Within +22/-82% (-30°c to +85°c) C7 : Within +/-22% (-55°c to +125°c) C8 : Within +/-22% (-55°c to +105°c)	each speci The ranges Reference shown in the In case of a measured	itance change should be meas fied temp. stage. s of capacitance change composition. Temperature value over the teme table should be within the spapplying voltage, the capacitan after 1 more min. with applying in of each temp. stage.	ared with the mperature ranges pecified ranges.* ce change should be			
				*GRM43 E	31/R6 0J/1A 336/476 only: 1.0	±0.2Vrms			
				Step	Temperature (°C)	Applying Voltage (V)			
9	Capacitance Temperature			2	Reference Tempereture±2  -55±3 (for R6, C7, C8)/ -25±3 (for B1, B3, F1) -30±3 (for F5)				
	Characteristics			3	Reference Tempereture±2	No bias			
		50% of the Rated Voltage	B1: Within +10/-30%	4	85±3 (for B1, B3, F1, R6, F5) 125±3 (for C7)/ 105±3 (for C8)/				
			F1: Within +30/—95%	5	20±2				
				6	-25±3 (for B1, F1)	50% of the rated			
				7	20±2	voltage			
				8	85±3 (for B1, F1)				
				Initial mea Perform a then set fo	asurement for high dielectric co heat treatment at 150 +0/-10° r 48±4 hours at room temperat e initial measurement.	C for one hour and			



	Continued from the prece	eding page.					
No.	Item	Specifications	Test Method				
		No removal of the terminations or other defects should occur	Solder the capacitor on the test jig (glass epoxy board) shown in Fig. 1a using an eutectic solder. Then apply 10N* force in parallel with the test jig for 10+/—1sec.  The soldering should be done either with an iron or using the reflow method and should be conducted with care so that the soldering is uniform and free of defects such as heat shock.  *5N: GR□15/GRM18, 2N: GR□33				
10	Adhesive Strength of Termination	Solder resist Baked electrode or copper foil  Fig. 1a	Type         a         b         c           GR□03         0.3         0.9         0.3           GR□15         0.4         1.5         0.5           GRM18         1.0         3.0         1.2           GRM21         1.2         4.0         1.65           GRM31         2.2         5.0         2.0           GRM32         2.2         5.0         2.9           GRM43         3.5         7.0         3.7           GRM55         4.5         8.0         5.6				
	Appearance	No defects or abnormalities	Solder the capacitor on the test jig (glass epoxy board) in the				
11	Capacitance	Within the specified tolerance B1, B3, R6, C7, C8: 0.1 max. F1, F5: 0.2 max.	same manner and under the same conditions as (10).  The capacitor should be subjected to a simple harmonic motion having a total amplitude of 1.5mm, the frequency being varied uniformly between the approximate limits of 10 and 55Hz. The frequency range, from 10 to 55Hz and return to 10Hz, should be traversed in approximately 1 minute. This motion should be applied for a period of 2 hours in each 3 mutually perpendicular directions (total of 6 hours).				
12	Deflection	No cracking or marking defects should occur  20 50 Pressunzing speed: 1.0mm/sec.  Pressunze  R230  Flexure: ≤1  Capacilance meter  45  45	Solder the capacitor on the test jig (glass epoxy board) shown in Fig. 2a using an eutectic solder. Then apply a force in the direction shown in Fig. 3a for 5+/-1 sec. The soldering should be done either with an iron or using the reflow method and should be conducted with care so that the soldering is uniform and free of defects such as heat shock.  Fig. 2a  (GRD03, GRD15:t:0.8mm)				
			Type a b c				
		Fig.3a	GR□03     0.3     0.9     0.3       GR□15     0.4     1.5     0.5       GRM18     1.0     3.0     1.2       GRM21     1.2     4.0     1.65       GRM31     2.2     5.0     2.0       GRM32     2.2     5.0     2.9       GRM43     3.5     7.0     3.7       GRM55     4.5     8.0     5.6       (in mm)				
13	Solderability of Termination	75% of the terminations is to be soldered evenly and continuously	Immerse the capacitor in a solution of ethanol (JIS-K-8101) and rosin (JIS-K-5902) (25% rosin in weight propotion) . Preheat at 80 to 120 $^\circ$ for 10 to 30 seconds. After preheating, immerse in an eutectic solder solution for 2+/-0.5 seconds at 230+/-5 $^\circ$ .				

710	continued fr	om the prec	eding page.							
No.	Ite	m	Specifications		Test Method					
14	Resistance to Soldering Heat	Appearance Capacitance Change Q/D.F. I.R. Dielectric	No defects or abnormalities  B1, B3, R6, C7, C8: Within ±7.5%  F1, F5: Within ±20%  B1, B3, R6, C7, C8: 0.1 max.  F1, F5: 0.2 max.  More than 50Ω • F  No defects	Immerse the c 270+/-5°C for 24+/-2 hours hours (high die  Initial measur Perform a hea then set at roo	Preheat the capacitor at 120 to 150°C for 1 minute.  Immerse the capacitor in an eutectic solder solution at 270+/-5°C for 10+/-0.5 seconds. Set at room temperature for 24+/-2 hours (temperature compensating tyoe) or 48+/-4 hours (high dielectric constant type), then measure.  •Initial measurement for high dielectric constant type Perform a heat treatment at 150+0/-10°C for one hour and then set at room temperature for 48+/-4 hours.					
		Strength			100℃ to 120℃			me min. min.		
		Appearance Capacitance Change D.F.	No defects or abnormalities  B1, B3, R6, C7, C8: Within ±7.5% F1, F5: Within ±20%  B1, B3, R6, C7, C8: 0.1 max. F1, F5: 0.2 max.  More than 50Q • F	under the sam Perform the fiv shown in the fiv Set for 24+/-/ 48+/4 hours	ne capacitor to the supporting jig in the same manner and our the same conditions as (10).  Form the five cycles according to the four heat treatments on in the following table.  For 24+/-2 hours (temperature compensating type) or 1-4 hours (high dielectric constant type) at room lerature, then measure.					
15	Temperature Sudden Change -	Dielectric Strength	No defects	Step Temp. (℃)	Min. Operating Temp. +0/-3	2 Room Temp.	Max. Operating Temp. +3/-0	Room Temp.		
				Perform a hea then set at roo	30±3 2 to 3 30±3 2 to 3  ement for high dielectric constant type t treatment at 150+0/−10°C for one hour and m temperature for 48+/−4 hours. itial measurement.					
	High Temperature High Humidity (Steady)	Appearance Capacitance Change	No defects or abnormalities B1, B3, R6, C7, C8: Within ±12.5% F1, F5: Within ±30%		Apply the rated voltage at 40+/−2℃ and 90 to 95% humidity 500+/−12 hours. The charge/discharge currentis less than 50mA.					
16		D.F.	B1, B3, R6, C7, C8 : 0.2 max. F1, F5 : 0.4 max. More than 12.5Ω • F	Perform a heat then let sit for	<ul> <li>Initial measurement</li> <li>Perform a heat treatment at 150+0/−10°C for one hour and then let sit for 48+/−4 hours at room temperature. Perform the initial measurement.</li> </ul>					
					t treatment at		10℃ for one ho temperature, th			
	Durability	Appearance Capacitance Change	No defects or abnormalities B1, B3, R6, C7, C8: Within ±12.5% F1, F5: Within ±30%	maximum oper	Apply 150% of the rated voltage for 1000+/-12 hours at the maximum operating temperature +/-3°C. Let sit for 48+/-4 hours at room temperature, then measure.  The charge/ discharge current is less than 50mA.					
7		D.F.	B1, B3, R6, C7, C8 : 0.1 max. F1, F5 : 0.4 max.	•Initial measur Perform a hea	•Initial measurement Perform a heat treatment at 150+0/−10℃ for one hour and					
	Jurability	I.R.	More than 25Ω • F	initial measure •Measurement Perform a hea	ement. t after test t treatment at	150+0/	temperature. Po 10℃ for one ho temperature, th	ur and		