

# NPN Epitaxial Silicon Transistor

# KSC3503

#### **Features**

• High Voltage:  $V_{CEO} = 300 \text{ V}$ 

• Low Reverse Transfer Capacitance:  $C_{re} = 1.8 \text{ pF}$  at  $V_{CB} = 30 \text{ V}$ 

• Excellent Gain Linearity for Low THD

• High Frequency: 150 MHz

• Full Thermal and Electrical Spice Models are Available

• Complement to KSA1381

• These Devices are Pb-Free and are RoHS Compliant

#### **Applications**

• Audio, Voltage Amplifier and Current Source

• CRT Display, Video Output

• General Purpose Amplifier

### **ABSOLUTE MAXIMUM RATINGS** (T<sub>A</sub> = 25°C unless otherwise noted)

Parameter	Symbol	Ratings	Units
Collector-Base Voltage	BV <sub>CBO</sub>	300	V
Collector-Emitter Voltage	BV <sub>CEO</sub>	300	V
Emitter-Base Voltage	BV <sub>EBO</sub>	5	Q'
Collector Current (DC)	lc	100	mA
Collector Current (Pulse)	ICP	200	mA
Total Device Dissipation, $T_C = 25^{\circ}C$ $T_C = 125^{\circ}C$	Pc	7,1,2	W W
Junction and Storage Temperature	TJ, T <sub>STG</sub>	-50 ~ +150	°C

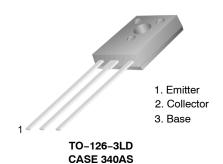
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

# THERMAL CHARACTERISTICS (Note 1)

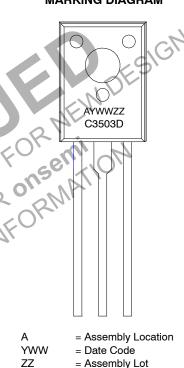
(T<sub>A</sub> = 25°C unless otherwise noted)

Parameter	Symbol	Max.	Units
Thermal Resistance, Junction to Case	$R_{\theta JC}$	17.8	°C/W

1. Device mounted on minimum pad size.



#### **MARKING DIAGRAM**



#### **ORDERING INFORMATION**

C3503D

= Specific Device Code

See detailed ordering and shipping information on page 2 of this data sheet

#### KSC3503

# **ELECTRICAL CHARACTERISTICS** (Note 2) (T<sub>A</sub> = 25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Тур.	Max.	Unit
BV <sub>CBO</sub>	Collector-Base Breakdown Voltage	$I_C = 10 \mu A, I_E = 0$	300			V
BV <sub>CEO</sub>	Collector-Emitter Breakdown Voltage	$I_C = 1 \text{ mA}, I_B = 0$	300			V
BV <sub>EBO</sub>	Emitter-Base Breakdown Voltage	$I_E = 10 \mu A, I_C = 0$	5			V
I <sub>CBO</sub>	Collector Cut-Off Current	V <sub>CB</sub> = 200 V, I <sub>E</sub> = 0			0.1	μΑ
I <sub>EBO</sub>	Emitter Cut-Off Current	$V_{EB} = 4 \text{ V}, I_{C} = 0$			0.1	μΑ
h <sub>FE</sub>	DC Current Gain	$V_{CE} = 10 \text{ V}, I_{C} = 10 \text{ mA}$	60		120	
V <sub>CE</sub> (sat)	Collector-Emitter Saturation Voltage	$I_C = 20 \text{ mA}, I_B = 2 \text{ mA}$			0.6	V
V <sub>BE</sub> (sat)	Base-Emitter Saturation Voltage	$I_C = 20 \text{ mA}, I_B = 2 \text{ mA}$			1	V
f <sub>T</sub>	Current Gain Bandwidth Product	$V_{CE} = 30 \text{ V}, I_{C} = 10 \text{ mA}$		150		MHz
C <sub>ob</sub>	Output Capacitance	V <sub>CB</sub> = 30 V, f = 1 MHz		2.6		pF
C <sub>ob</sub>	Output Capacitance	V <sub>CB</sub> = 30 V, f = 1 MHz		1.8		pF

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

#### **ORDERING INFORMATION**

Part Number*	Marking	Package	Shipping
KSC3503DS	C3503D	TO-126-3LD (Pb-Free)	2000 Units / Bulk Box
KSC3503DSTU	C3503D	TO-126-3LD (Pb-Free)	1920 Units / Tube
THIS DEVIC	REPRESENT	COMME YOUNFOR INFORMATION OF THE FOR INFORMATION OF THE FOR INFORMATION OF THE FORMATION OF	

<sup>\*</sup>Suffix "-TU" means the tube packing, The Suffix "TU" could be replaced to other suffix character as packing method.

<sup>2.</sup> Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2%

### KSC3503

#### **TYPICAL CHARACTERISTICS**

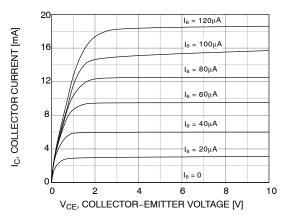


Figure 1. Static Characteristic

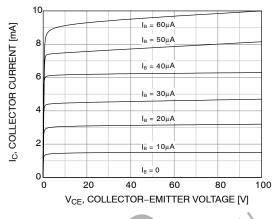


Figure 2. Static Characteristic

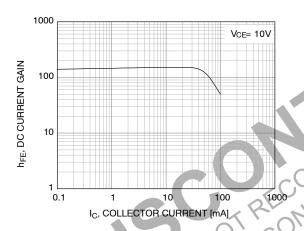


Figure 3. DC Current Gain

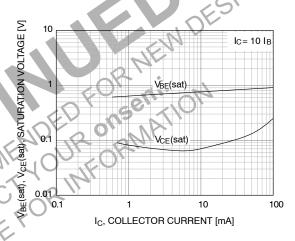


Figure 4. Base–Emitter Saturation Voltage Collector–Emitter Saturation Voltage

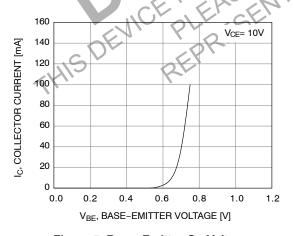


Figure 5. Base-Emitter On Voltage

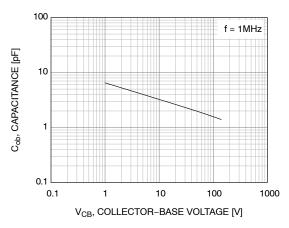


Figure 6. Collector Output Capacitance

### KSC3503

#### **TYPICAL CHARACTERISTICS**

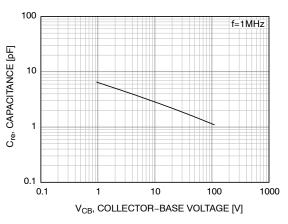


Figure 7. Reverse Transfer Capacitance

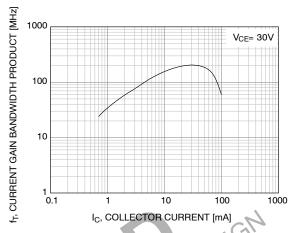
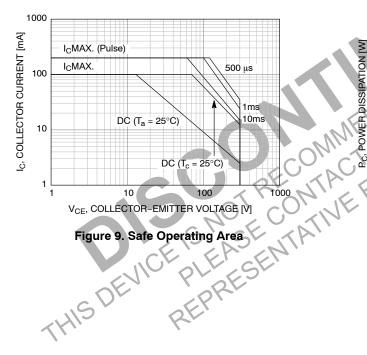


Figure 8. Current Gain Bandwidth Product



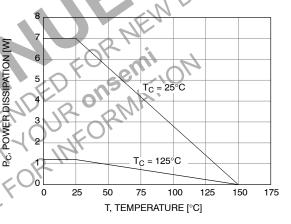
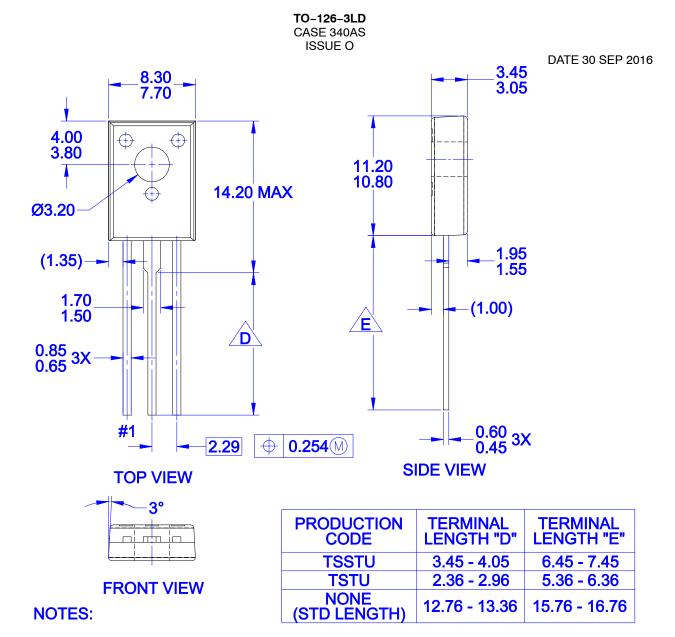


Figure 10. Power Derating





- A. NO INDUSTRY STANDARD APPLIES TO THIS PACKAGE
- B. ALL DIMENSIONS ARE IN MILLIMETERS
- C. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH, AND TIE BAR PROTRUSIONS

FOR TERMINAL LENGTH "E", REFER TO TABLE



DOCUMENT NUMBER:	98AON13817G	Electronic versions are uncontrolled except when accessed directly from the Document Repositor Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.	
DESCRIPTION:	TO-126-3LD		PAGE 1 OF 1

onsemi and ONSEMI are trademarks of Semiconductor Components Industries, LLC dba onsemi or its subsidiaries in the United States and/or other countries. onsemi reserves the right to make changes without further notice to any products herein. onsemi makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does onsemi assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. onsemi does not convey any license under its patent rights nor the rights of others.

onsemi, Onsemi, and other names, marks, and brands are registered and/or common law trademarks of Semiconductor Components Industries, LLC dba "onsemi" or its affiliates and/or subsidiaries in the United States and/or other countries. onsemi owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of onsemi's product/patent coverage may be accessed at <a href="www.onsemi.com/site/pdf/Patent-Marking.pdf">www.onsemi.com/site/pdf/Patent-Marking.pdf</a>. Onsemi reserves the right to make changes at any time to any products or information herein, without notice. The information herein is provided "as-is" and onsemi makes no warranty, representation or guarantee regarding the accuracy of the information, product features, availability, functionality, or suitability of its products for any particular purpose, nor does onsemi assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using onsemi products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by onsemi. "Typical" parameters which may be provided in onsemi data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. onsemi does not convey any license under any of its intellectual property rights nor the rights of others. onsemi products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA class 3 medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase

#### ADDITIONAL INFORMATION

**TECHNICAL PUBLICATIONS:** 

 $\textbf{Technical Library:} \ \underline{www.onsemi.com/design/resources/technical-documentation}$ 

onsemi Website: www.onsemi.com

ONLINE SUPPORT: www.onsemi.com/support

For additional information, please contact your local Sales Representative at

www.onsemi.com/support/sales