



YOUSHANG SEMICONDUCTOR

设计研发新型功率器件

各类小信号开关

中低压及高压大电流等场效应管

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Features

- Epitaxial Planar Die Construction
- Ideal for Low Power Amplification and Switching
- Complementary PNP Type: NK-MMBTA55 and NK-MMBTA56

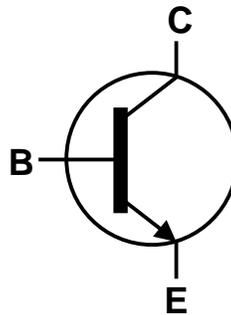
Mechanical Data

- Package: SOT23
- Package Material: Molded Plastic, "Green" Molding Compound
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads, Solderable per
MIL-STD-202, Method 208③
- Weight: 0.008 grams (Approximate)

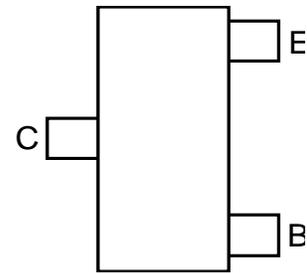
SOT23



Top View



Device Symbol



Top View
Pin Configuration

Absolute Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	MMBTA05	MMBTA06	Unit
Collector-Base Voltage	V _{CB0}	60	80	V
Collector-Emitter Voltage	V _{CE0}	60	80	V
Emitter-Base Voltage	V _{EBO}	4.0		V
Collector Current	I _C	500		mA
Peak Collector Current	I _{CM}	1		A

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Power Dissipation	P _D	(Note 5) 310	mW
		(Note 6) 350	
Thermal Resistance, Junction to Ambient	R _{θJA}	(Note 5) 403	°C/W
		(Note 6) 357	
Thermal Resistance, Junction to Leads	R _{θJL}	350	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

ESD Ratings (Note 8)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

- Notes:
5. For a device mounted on minimum recommended pad layout 1oz copper that is on a single-sided FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.
 6. Same as note (5), except the device is mounted on 15 mm x 15mm 1oz copper.
 7. Thermal resistance from junction to solder-point (at the end of the leads).
 8. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

Thermal Characteristics and Derating Information

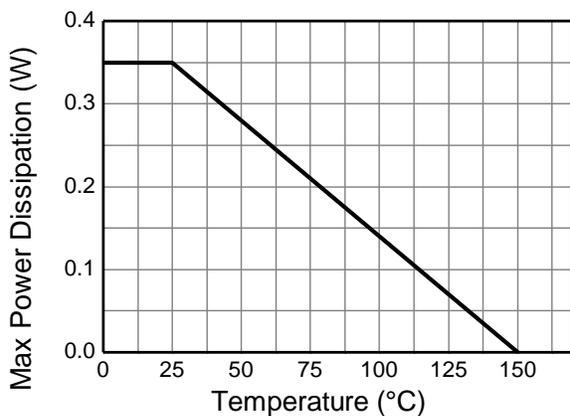


Figure 1 Derating Curve

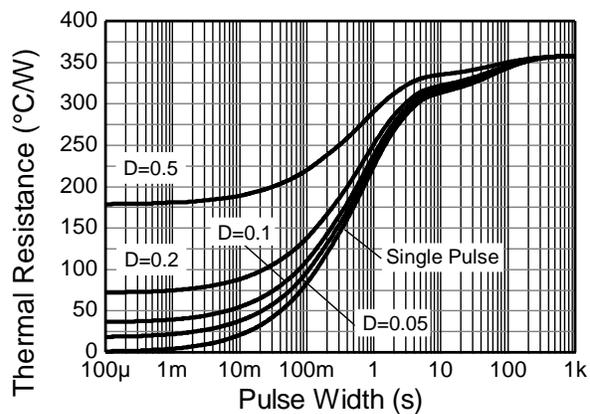


Figure 2 Transient Thermal Impedance

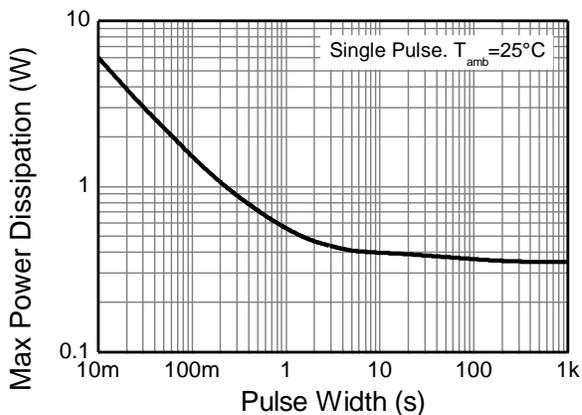


Figure 3 Pulse Power Dissipation

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Max	Unit	Test Condition
OFF CHARACTERISTICS					
Collector-Base Breakdown Voltage	NK-MMBTA05 NK-MMBTA06	BV _{CBO}	60 80	—	V I _C = 100μA, I _E = 0
Collector-Emitter Breakdown Voltage (Note 9)	NK-MMBTA05 NK-MMBTA06	BV _{CEO}	60 80	—	V I _C = 10.0mA, I _B = 0
Emitter-Base Breakdown Voltage		BV _{EBO}	4.0	—	V I _E = 100 μA, I _C = 0
Collector Cutoff Current	NK-MMBTA05 NK-MMBTA06	I _{CBO}	—	100	nA V _{CB} = 60V, I _E = 0 V _{CB} = 80V, I _E = 0
Collector Cutoff Current	NK-MMBTA05 NK-MMBTA06	I _{CES}	—	100	nA V _{CE} = 60V, I _{BO} = 0V V _{CE} = 80V, I _{BO} = 0V
ON CHARACTERISTICS (Note 9)					
DC Current Gain		h _{FE}	100	—	— I _C = 10mA, V _{CE} = 1.0V I _C = 100mA, V _{CE} = 1.0V
Collector-Emitter Saturation Voltage		V _{CE(sat)}	—	0.25	V I _C = 100mA, I _B = 10mA
Base-Emitter Turn-On Voltage		V _{BE(on)}	—	1.2	V I _C = 100mA, V _{CE} = 1.0V
SMALL SIGNAL CHARACTERISTICS					
Current Gain-Bandwidth Product		f _T	100	—	MHz V _{CE} = 2.0V, I _C = 10mA, f = 100MHz

Note: 9. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

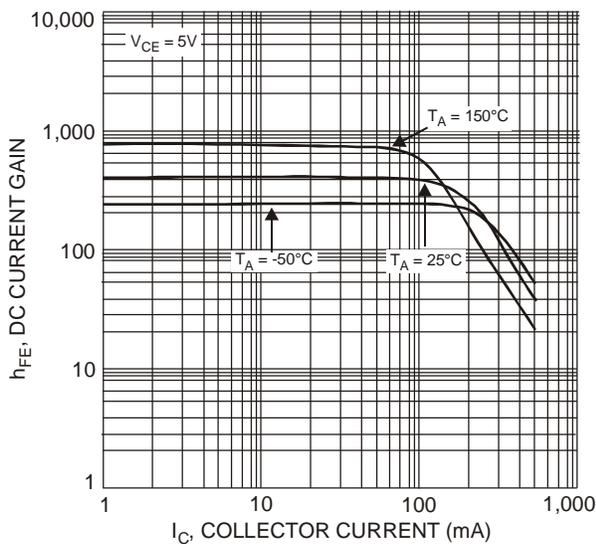


Figure 4 Typical DC Current Gain vs. Collector Current

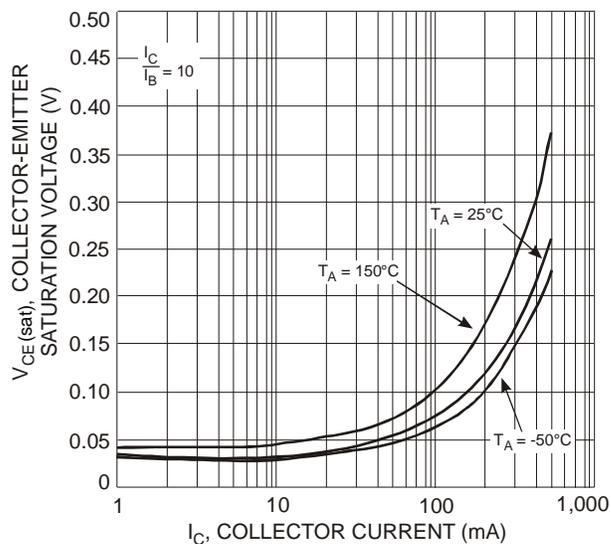


Figure 5 Collector-Emitter Saturation Voltage vs. Collector Current

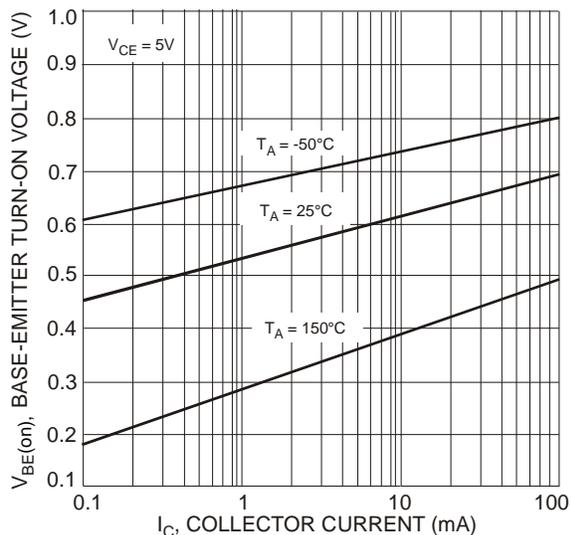


Figure 6 Typical Base-Emitter Turn-On Voltage vs. Collector Current

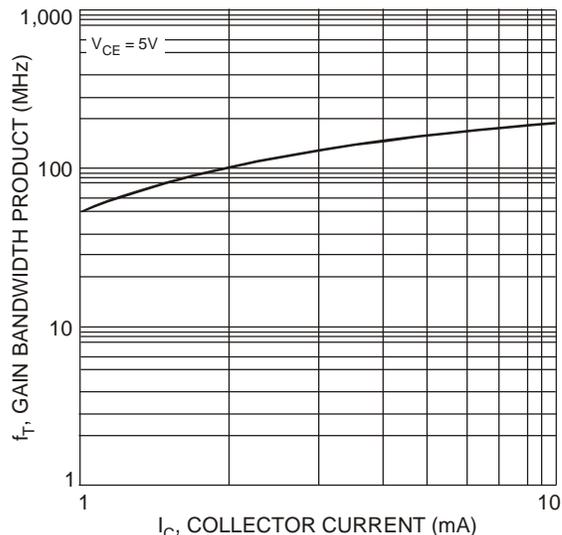


Figure 7 Typical Gain Bandwidth Product vs. Collector Current

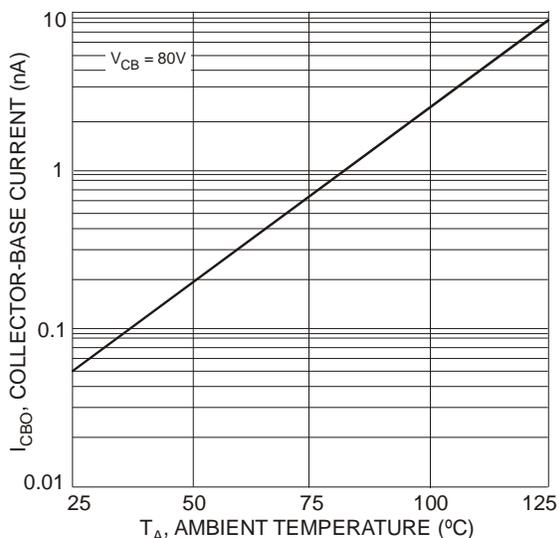


Figure 8 Typical Collector-Cutoff Current vs. Ambient Temperature

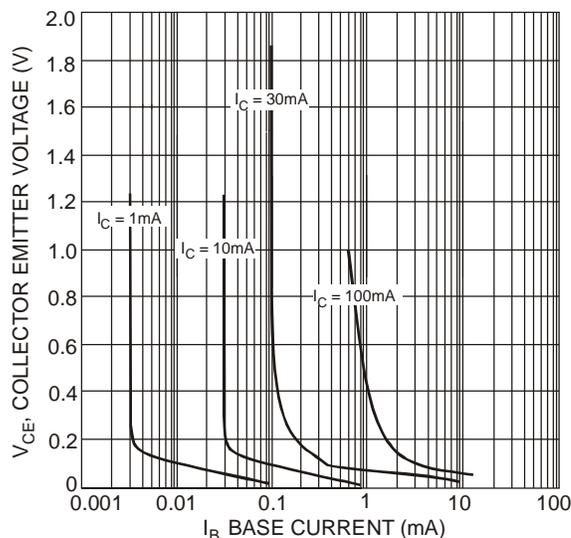
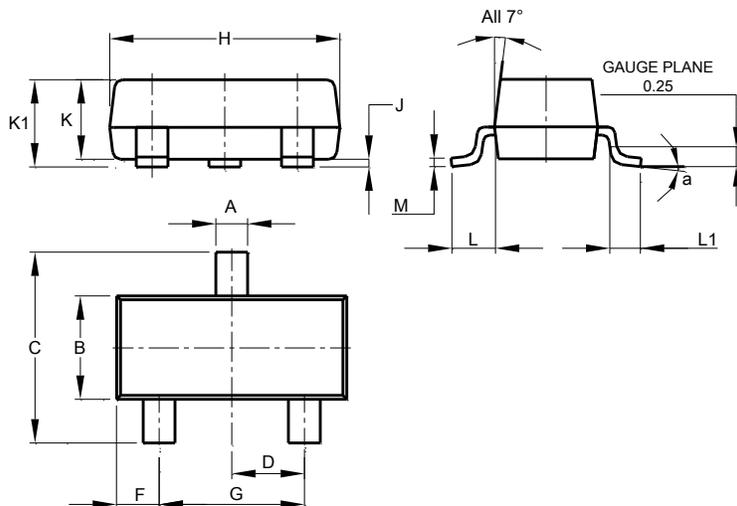


Figure 9 Typical Collector Saturation Region

Package Outline Dimensions

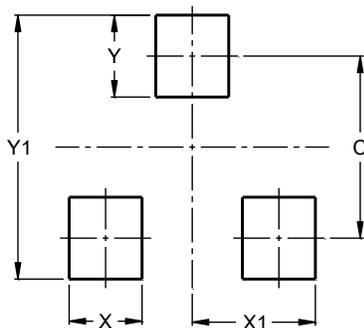
SOT23



SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	--
All Dimensions in mm			

Suggested Pad Layout

SOT23



Dimensions	Value (in mm)
C	2.0
X	0.8
X1	1.35
Y	0.9
Y1	2.9