优尚

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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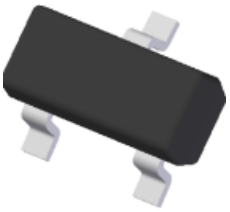
Features

- BV_{CEO} > 160V
- Ideal for Low Power Amplification and Switching
- Complementary PNP Type Available (NK-MMBT5401)

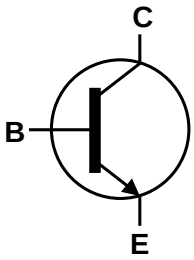
Mechanical Data

- 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 208 e3
- Weight: 0.008 grams (Approximate)

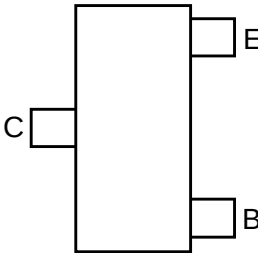
SOT23



Top View



Device Symbol



Top View
Pin-Out

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	180	V
Collector-Emitter Voltage	V_{CEO}	160	V
Emitter-Base Voltage	V_{EBO}	6.0	V
Collector Current - Continuous (Note 5)	I_C	600	mA

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

Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 5)	P_D	300	mW
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\theta JA}$	417	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

ESD Ratings (Note 6)

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 2oz copper that is on a single-sided FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.
6. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

Thermal Characteristics and Derating Information

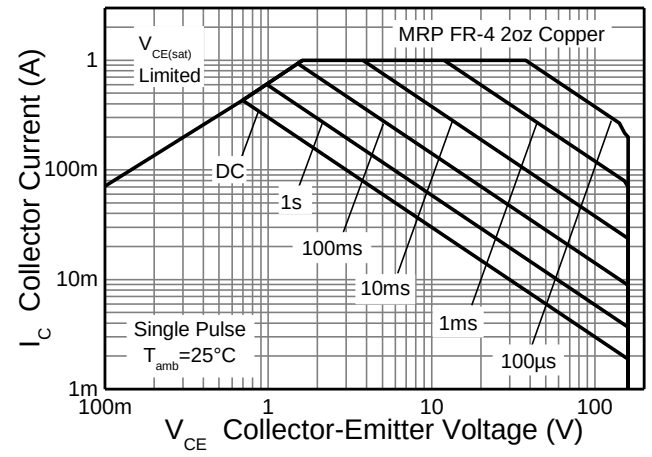


Figure 1. Safe Operating Area

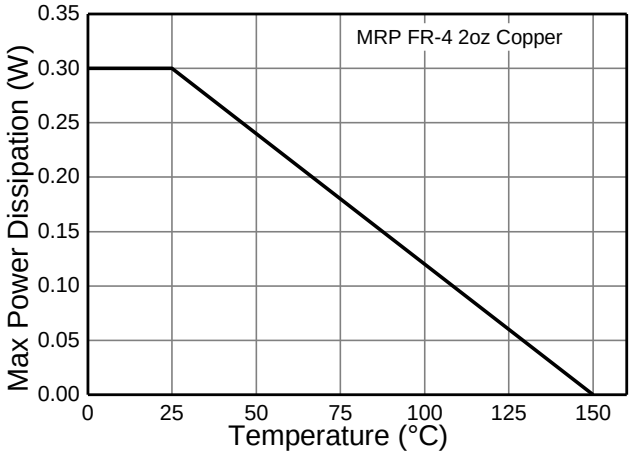


Figure 2. Derating Curve

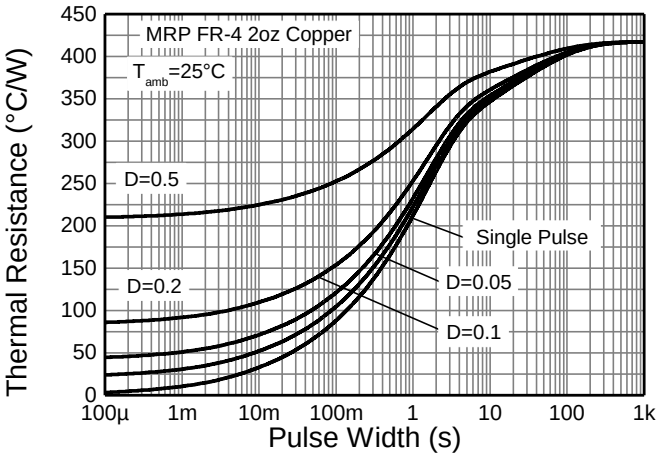


Figure 3. Transient Thermal Impedance

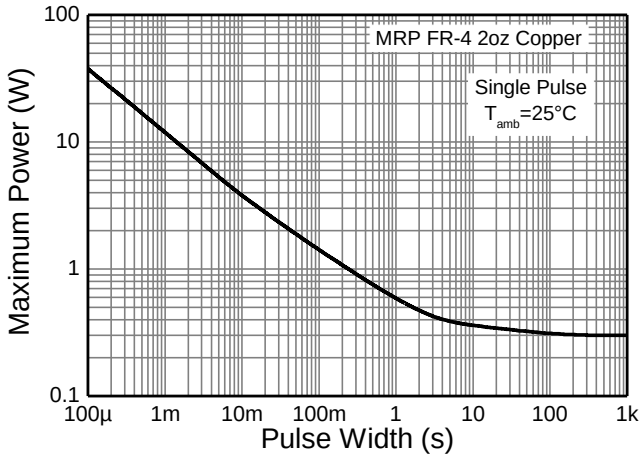


Figure 4. Pulse Power Dissipation

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

Characteristic	Symbol	Min	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)					
Collector-Base Breakdown Voltage	BV_{CBO}	180	—	V	I_C = 100μA
Collector-Emitter Breakdown Voltage	BV_{CEO}	160	—	V	I_C = 1mA
Emitter-Base Breakdown Voltage	BV_{EBO}	6	—	V	I_E = 10μA
Collector Cutoff Current	I_{CBO}	— —	50 50	nA μA	V_{CB} = 120V V_{CB} = 120V, T_A = +100°C
Emitter Cutoff Current	I_{EBO}	—	50	nA	V_{EB} = 4V
ON CHARACTERISTICS (Note 7)					
DC Current Gain	h_{FE}	80 80 30	— 250 —	—	I_C = 1.0mA, V_{CE} = 5V I_C = 10mA, V_{CE} = 5V I_C = 50mA, V_{CE} = 5V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	— —	0.15 0.20	V	I_C = 10mA, I_B = 1mA I_C = 50mA, I_B = 5mA
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	— —	1 1	V	I_C = 10mA, I_B = 1mA I_C = 50mA, I_B = 5mA
SMALL SIGNAL CHARACTERISTICS					
Output Capacitance	C_{obo}	—	6	pF	V_{CB} = 10V, f = 1MHz
Small Signal Current Gain	h_{FE}	50	250	—	V_{CE} = 10V, I_C = 1mA f = 1kHz
Current Gain-Bandwidth Product	f_t	100	300	MHz	V_{CE} = 10V, I_C = 10mA f = 100MHz
Noise Figure	nf	—	8	dB	V_{CE} = 5V, I_C = 200μA R_S = 1kΩ, f = 1kHz

Note: 7. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

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

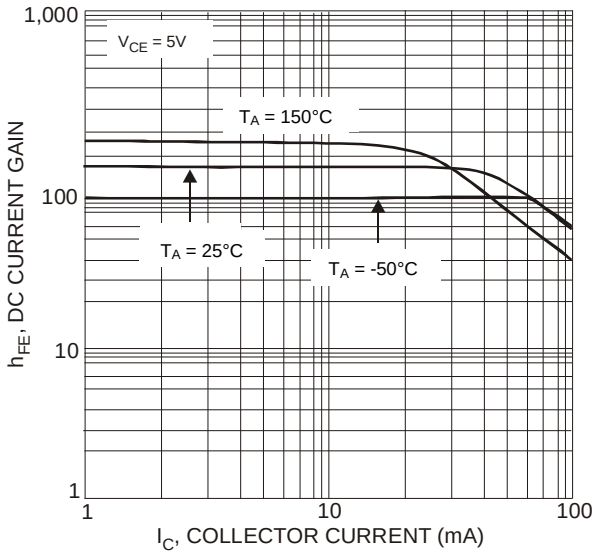


Figure 5. Typical DC Current Gain vs. Collector Current

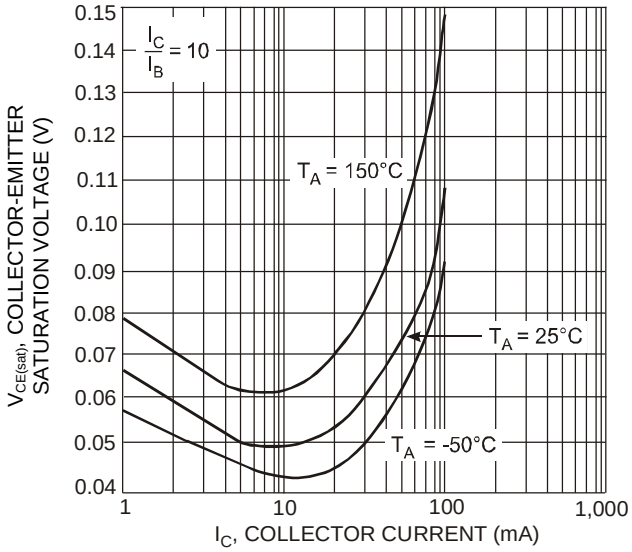


Figure 6. Typical Collector-Emitter Saturation Voltage vs. Collector Current

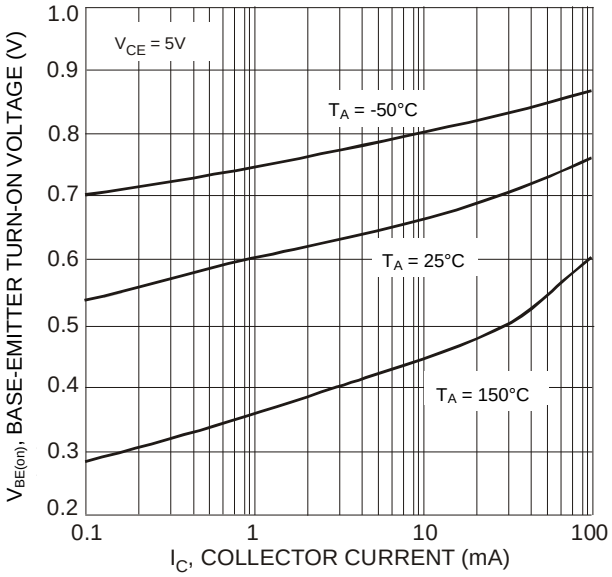


Figure 7. Typical Base-Emitter Turn-On Voltage vs. Collector Current

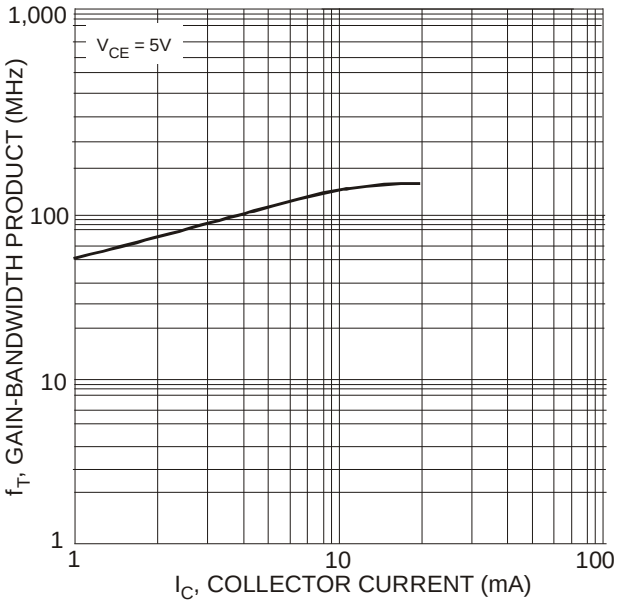
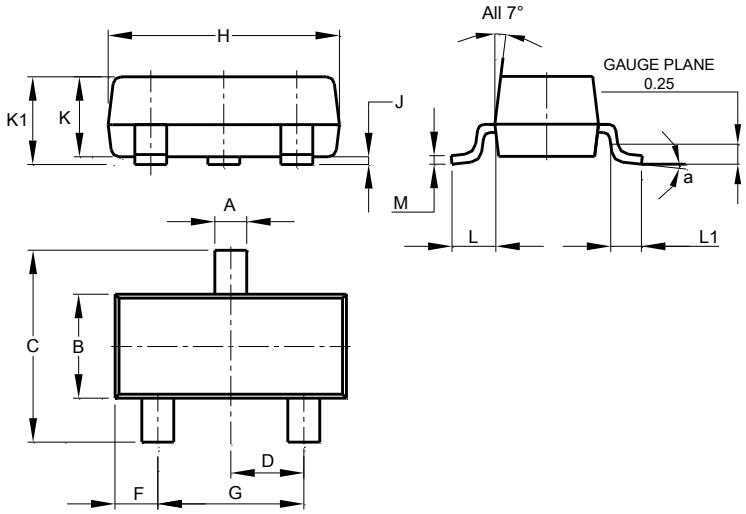


Figure 8. Typical Gain-Bandwidth Product vs. Collector Current

Package Outline Dimensions

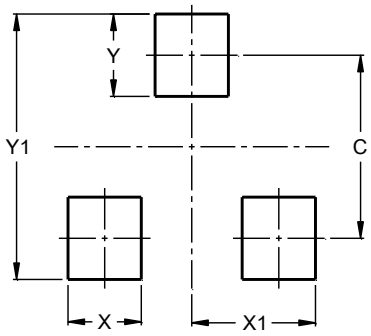
SOT23



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