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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Description

This Bipolar Junction Transistor (BJT) is designed to meet the stringent requirements of Automotive Applications.

Features

- BV_{CEO} > 60V
- I_C = 6A High Continuous Current
- I_{CM} = 12A Peak Pulse Current
- Low Saturation Voltage $V_{CE(SAT)}$ < 60mV @ 1A •

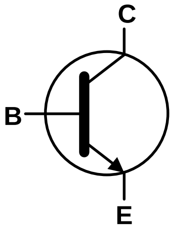
Complementary PNP Type: NK-DSS60600MZ4

Mechanical Data

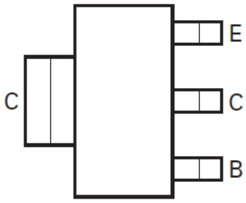
- Case: SOT223
- Case Material: Molded Plastic, “Green” Molding Compound. UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads. Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.112 grams (Approximate)

SOT223

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}	100	V
Collector-Emitter Voltage	V_{CEO}	60	V
Emitter-Base Voltage	V_{EBO}	6	V
Continuous Collector Current	I_C	6	A
Peak Pulse Collector Current	I_{CM}	12	A

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

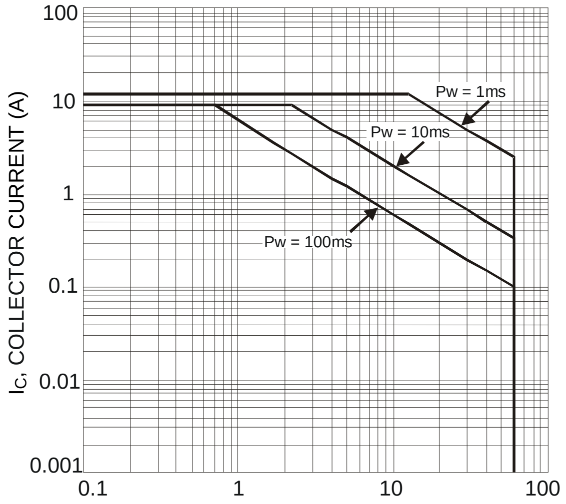
Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 6)	P_D	3	W
	(Note 7)		2	
	(Note 8)		1.2	
Thermal Resistance, Junction to Ambient	(Note 6)	$R_{\theta JA}$	41.7	°C/W
	(Note 7)		62.5	
	(Note 8)		104	
Thermal Resistance, Junction to Leads (Note 9)		$R_{\theta JL}$	12.9	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

ESD Ratings (Note 10)

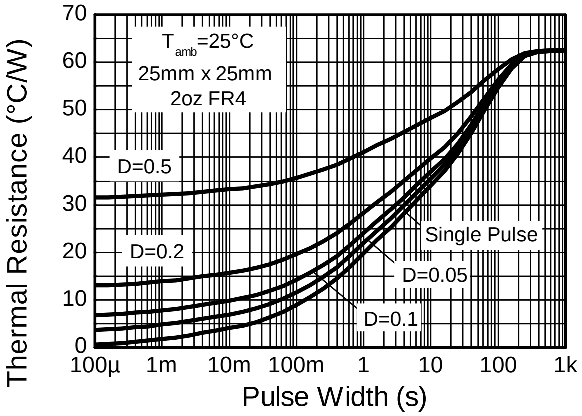
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

Notes:
6. For a device mounted with the collector lead on 50mm x 50mm 2oz copper that is on a single-sided 1.6mm FR-4 PCB; device is measured under still air conditions whilst operating in steady-state.
7. Same as note (6), except the device is mounted on 25mm x 25mm 2oz copper.
8. Same as note (6), except the device is mounted on minimum recommended pad (MRP) layout.
9. Thermal resistance from junction to solder-point (at the end of the collector lead).
10. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

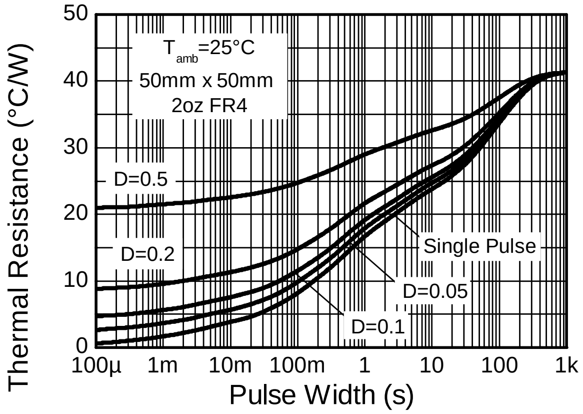
Thermal Characteristics and Derating Information



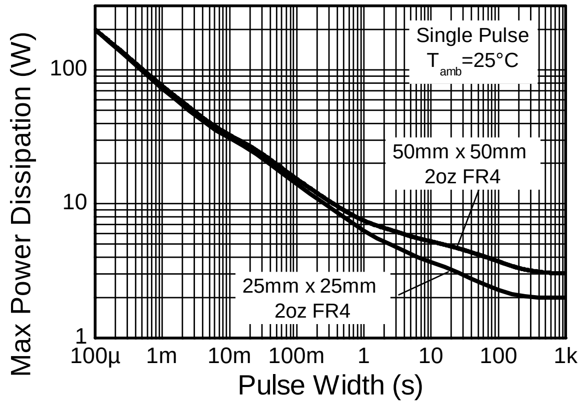
Typical Collector Current
vs. Collector-Emitter Voltage



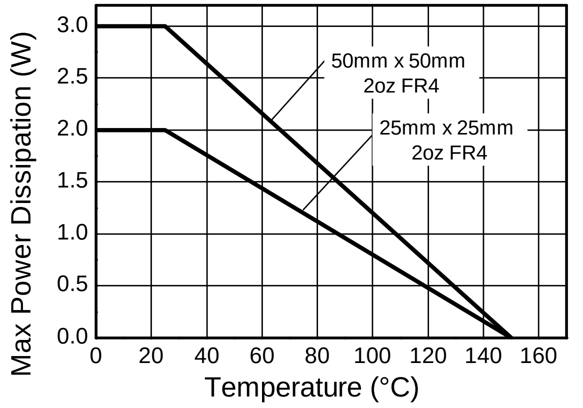
Transient Thermal Impedance



Transient Thermal Impedance



Pulse Power Dissipation



Derating Curve

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Conditions
OFF CHARACTERISTICS						
Collector-Base Breakdown Voltage	BV_{CBO}	100	—	—	V	$I_C = 100\mu A$
Collector-Emitter Breakdown Voltage (Note 11)	BV_{CEO}	60	—	—	V	$I_C = 10mA$
Emitter-Base Breakdown Voltage	BV_{EBO}	6	—	—	V	$I_E = 100\mu A$
Collector-Base Cutoff Current	I_{CBO}	—	—	100	nA	$V_{CB} = 40V, I_E = 0$
		—	—	50	µA	$V_{CB} = 40V, I_E = 0, T_J = +150°C$
Emitter-Base Cutoff Current	I_{EBO}	—	—	100	nA	$V_{EB} = 6V, I_C = 0$
ON CHARACTERISTICS (Note 11)						
DC Current Gain	h_{FE}	150	—	—	—	$V_{CE} = 2V, I_C = 0.5A$
		120	—	360		$V_{CE} = 2V, I_C = 1A$
		100	—	—		$V_{CE} = 2V, I_C = 2A$
		50	—	—		$V_{CE} = 2V, I_C = 6A$
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	—	—	40	mV	$I_C = 0.1A, I_B = 2.0mA$
		—	—	60		$I_C = 1A, I_B = 100mA$
		—	80	100		$I_C = 2A, I_B = 200mA$
		—	—	220		$I_C = 3A, I_B = 60mA$
		—	—	300		$I_C = 6A, I_B = 600mA$
Equivalent On-Resistance	$R_{CE(SAT)}$	—	40	50	mΩ	$I_E = 2A, I_B = 200mA$
Base-Emitter Saturation Voltage	$V_{BE(SAT)}$	—	—	0.9	V	$I_C = 1A, I_B = 100mA$
Base-Emitter Turn-on Voltage	$V_{BE(ON)}$	—	—	0.9	V	$V_{CE} = 2V, I_C = 1A$
SMALL SIGNAL CHARACTERISTICS						
Transition Frequency	f_T	100	—	—	MHz	$V_{CE} = 10V, I_C = 100mA$, $f = 100MHz$
Output Capacitance	C_{obo}	—	26	—	pF	$V_{CB} = 10V, f = 1MHz$
Input Capacitance	C_{ibo}	—	325	—	pF	$V_{EB} = 5V, f = 1MHz$
Turn-On Time	t_{ON}	—	87	—	ns	$V_{CC} = 30V$, $I_{CC} = 150mA$ $I_{B1} = - I_{B2} = 15mA$
Delay Time	t_D	—	41	—	ns	
Rise Time	t_R	—	46	—	ns	
Turn-Off Time	t_{OFF}	—	294	—	ns	
Storage Time	t_S	—	250	—	ns	
Fall Time	t_F	—	44	—	ns	

Notes: 11. Measured under pulsed conditions. Pulse width ≤ 300µs. Duty cycle ≤2%.

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

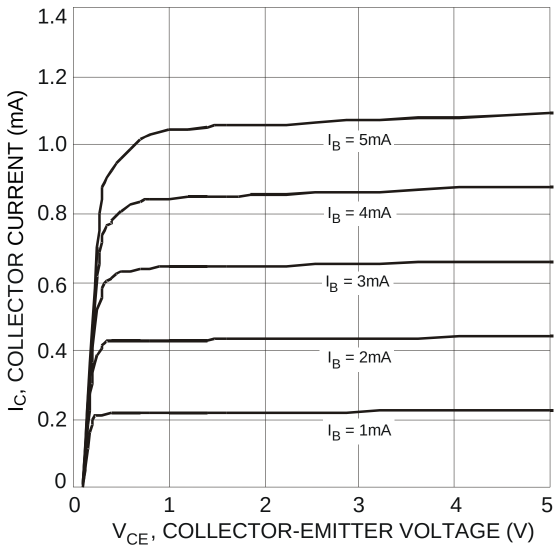


Fig. 1 Typical Collector Current
vs. Collector-Emitter Voltage

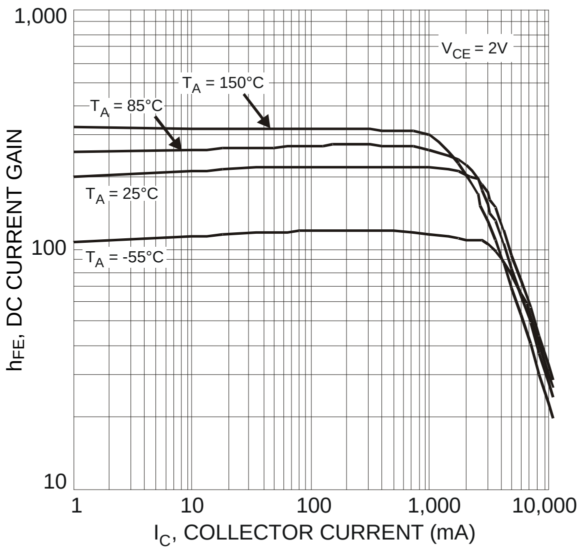


Fig. 2 Typical DC Current Gain vs. Collector Current

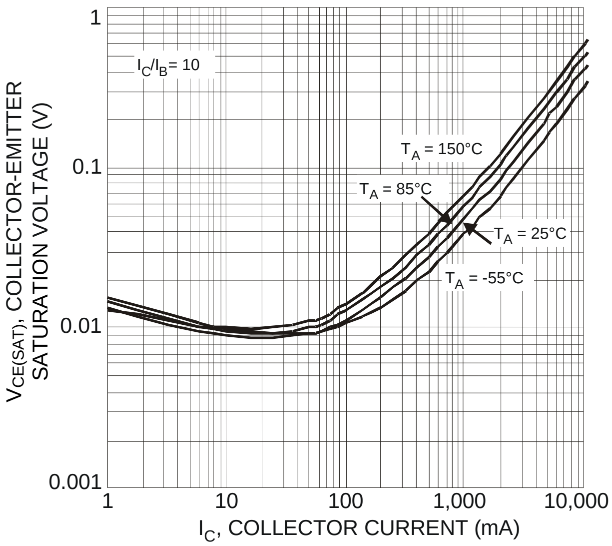


Fig. 3 Typical Collector-Emitter Saturation Voltage
vs. Collector Current

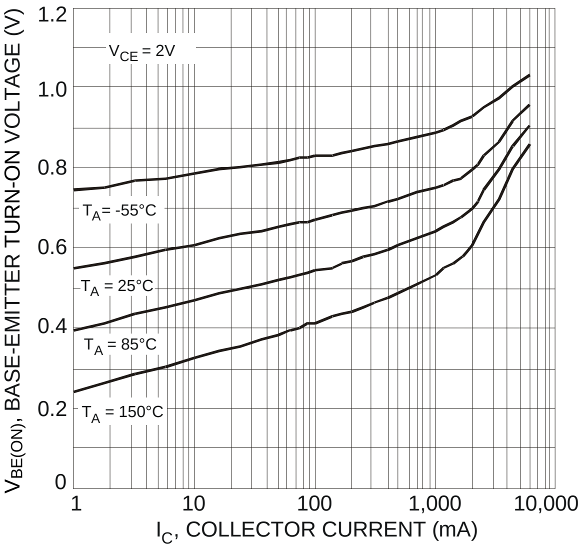


Fig. 4 Typical Base-Emitter Turn-On Voltage
vs. Collector Current

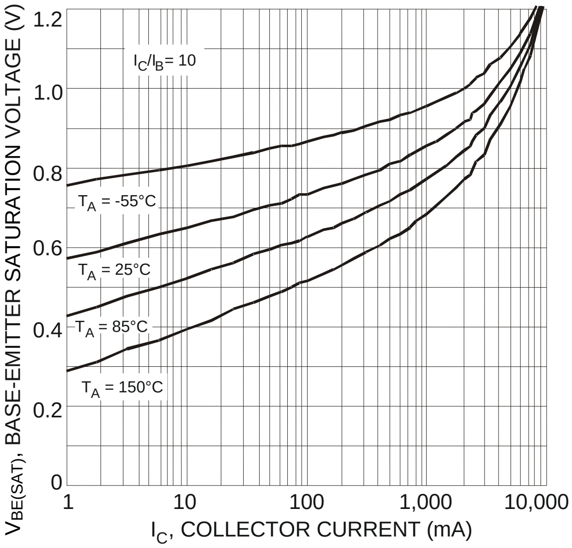


Fig. 5 Typical Base-Emitter Saturation Voltage vs. Collector Current

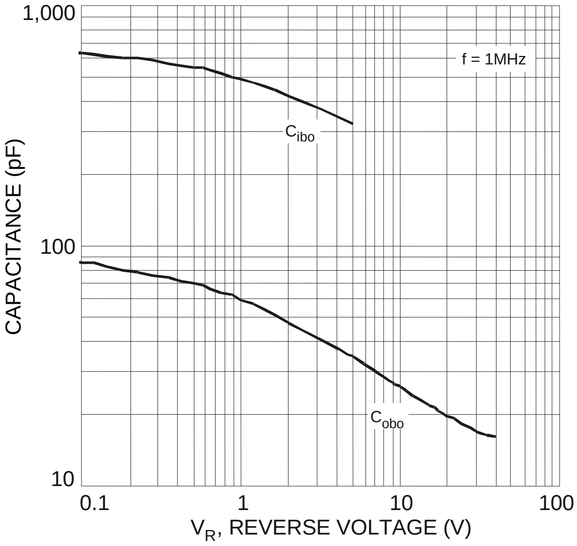


Fig. 6 Typical Capacitance Characteristics

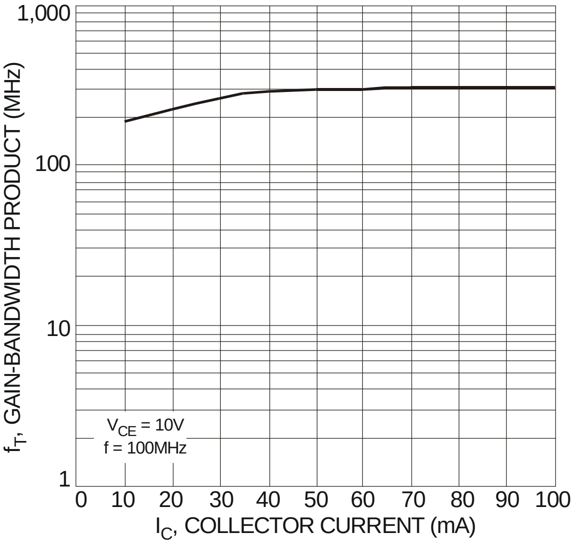
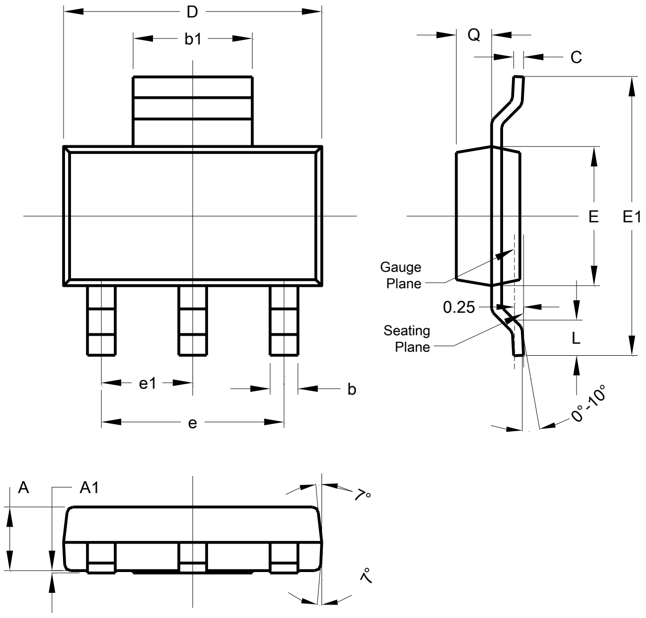


Fig. 7 Typical Gain-Bandwidth Product vs. Collector Current

Package Outline Dimensions

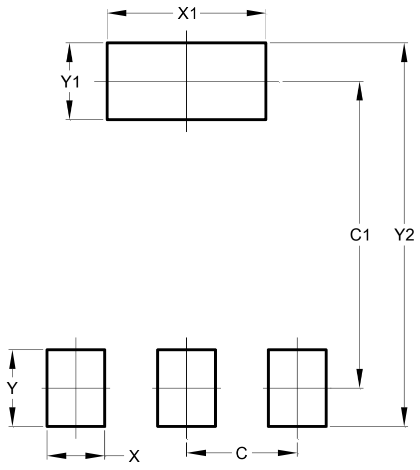
SOT223



SOT223			
Dim	**Min**	**Max**	**Typ**
A	1.55	1.65	1.60
A1	0.010	0.15	0.05
b	0.60	0.80	0.70
b1	2.90	3.10	3.00
C	0.20	0.30	0.25
D	6.45	6.55	6.50
E	3.45	3.55	3.50
E1	6.90	7.10	7.00
e	–	–	4.60
e1	–	–	2.30
L	0.85	1.05	0.95
Q	0.84	0.94	0.89
All Dimensions in mm			

Suggested Pad Layout

SOT223



Dimensions	Value (in mm)
C	2.30
C1	6.40
X	1.20
X1	3.30
Y	1.60
Y1	1.60
Y2	8.00