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

- $BV_{CEO} > 40V$
- Epitaxial Planar Die Construction
- Ideally Suited for Automated Assembly Processes
- Complementary PNP Type Available: DIODES™ NK-DZT2907A

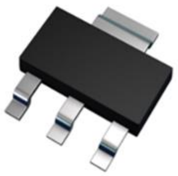
Mechanical Data

- Package: SOT223
- Package 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 ⓔ3
- Weight: 0.112 grams (Approximate)

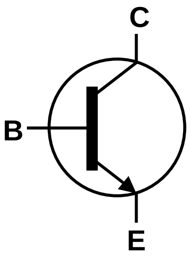
Applications

- Medium power switching & amplification

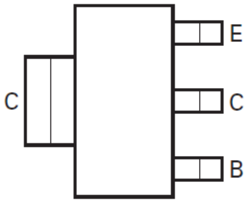
SOT223



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}	75	V
Collector-Emitter Voltage	V_{CEO}	40	V
Emitter-Base Voltage	V_{EBO}	6	V
Collector Current	I_C	600	mA

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

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P_D	0.83	W
Thermal Resistance, Junction to Ambient Air (Note 5)	$R_{\theta JA}$	150	°C/W
Thermal Resistance, Junction to Case (Note 5)	$R_{\theta JC}$	53	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Note: 5. For a device mounted on minimum recommended pad (MRP) layout that is on a single-sided 1.6mm FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.

Thermal Characteristics and Derating Information

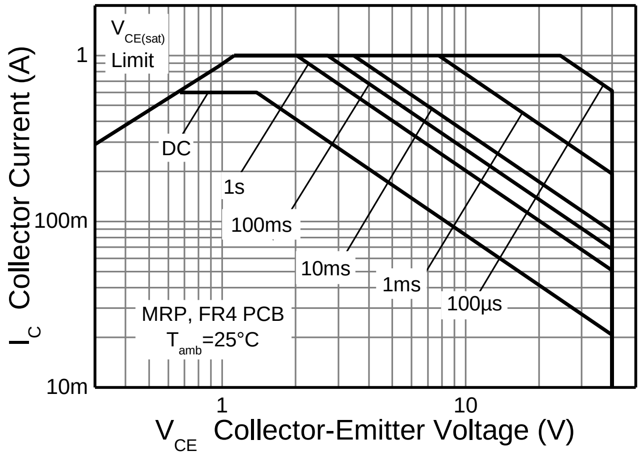


Figure 1. Safe Operating Area

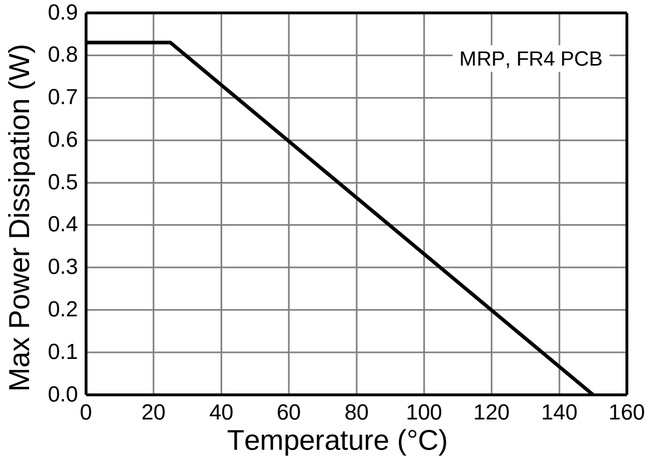


Figure 2. Derating Curve

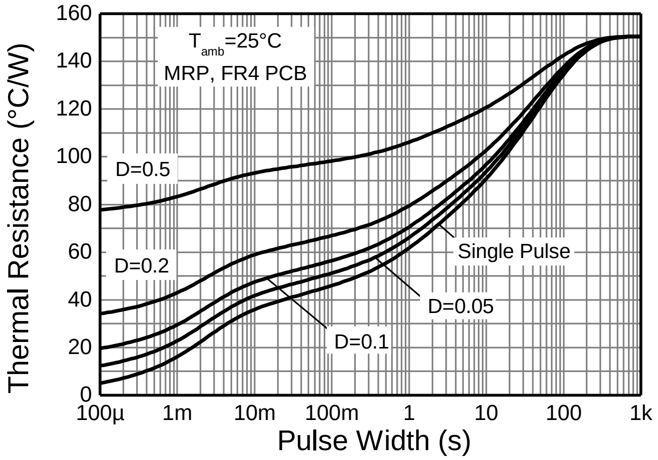


Figure 3 Transient Thermal Impedance

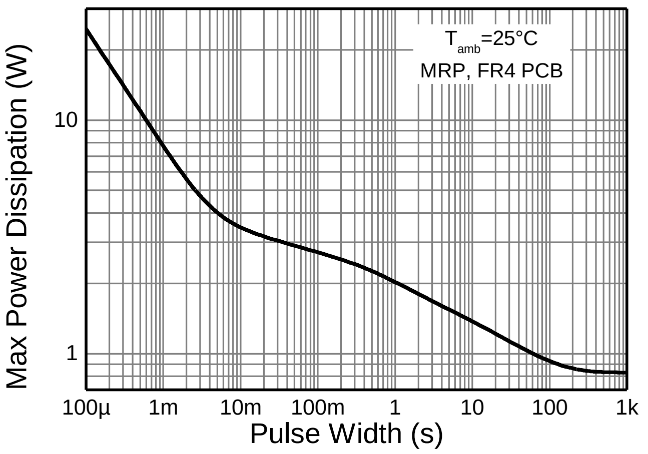


Figure 4 Pulse Power Dissipation

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Conditions
OFF CHARACTERISTICS (Note 6)						
Collector-Base Breakdown Voltage	BV_{CBO}	75	125	—	V	I_C = 100μA
Collector-Emitter Breakdown Voltage	BV_{CEO}	40	59	—	V	I_C = 10mA
Emitter-Base Breakdown Voltage	BV_{EBO}	6	7.5	—	V	I_E = 100μA
Collector-Base Cut-Off Current	I_{CBO}	—	2	10	nA	V_{CB} = 50V
		—	—	10	μA	V_{CB} = 50V, T_A = +150°C
Emitter-Base Cut-Off Current	I_{EBO}	—	2	10	nA	V_{EB} = 3V
Collector-Emitter Cut-Off Current	I_{CEX}	—	—	10	nA	V_{CE} = 60V, $V_{EB(off)}$ = 3V
ON CHARACTERISTICS (Note 6)						
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	—	0.11	0.3	V	I_C = 150mA, I_B = 15mA
		—	0.31	1.0	V	I_C = 500mA, I_B = 50mA
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	0.6	0.87	1.2	V	I_C = 150mA, I_B = 15mA
		—	1.04	2.0	V	I_C = 500mA, I_B = 50mA
DC Current Gain	h_{FE}	35	2.12	—	—	I_C = 0.1mA, V_{CE} = 10V
		50	263	—		I_C = 1mA, V_{CE} = 10V
		75	223	—		I_C = 10mA, V_{CE} = 10V
		35	131	—		I_C = 10mA, V_{CE} = 10V, T_A = -55°C
		100	229	300		I_C = 150mA, V_{CE} = 10V
		50	123	—		I_C = 150mA, V_{CE} = 1V
		40	67	—		I_C = 500mA, V_{CE} = 10V
SMALL SIGNAL CHARACTERISTICS						
Transition Frequency	f_T	300	—	—	MHz	I_C = 20mA, V_{CE} = 20V, f = 100MHz
Output Capacitance	C_{obo}	—	—	8	pF	V_{CB} = 10V, f = 1MHz
Input Capacitance	C_{ibo}	—	—	25	pF	V_{EB} = 0.5V, f = 1MHz
SWITCHING CHARACTERISTICS						
Delay Time	t_d	—	3.9	10	ns	V_{CE} = 30V, $V_{EB(off)}$ = 0.5V, I_C = 150mA, I_{B1} = 15mA
Rise Time	t_r	—	6.4	25	ns	
Storage Time	t_s	—	188	225	ns	V_{CE} = 30V, I_C = 150mA, I_{B1} = -I_{B2} = 15mA
Fall Time	t_f	—	42	60	ns	

Note: 6. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

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

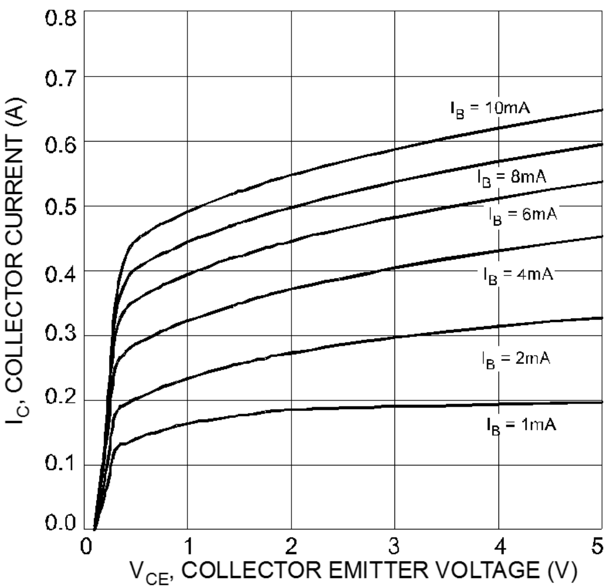


Figure 5. Typical Collector Current vs. Collector Emitter Voltage

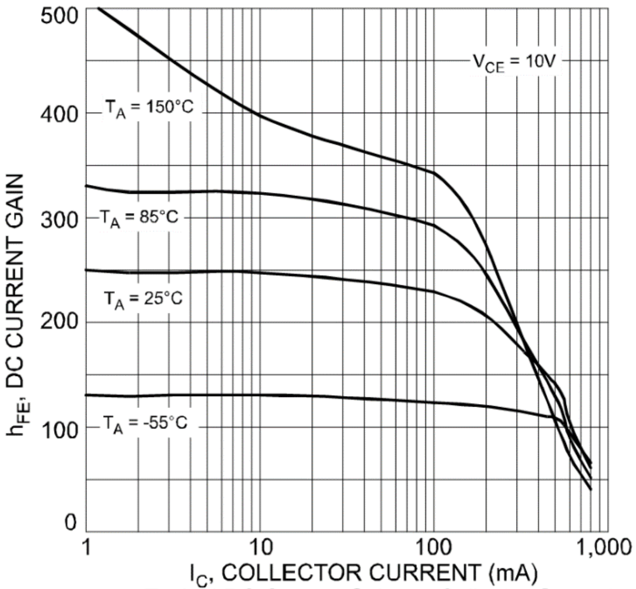


Figure 6. Typical DC Current Gain vs. Collector Current

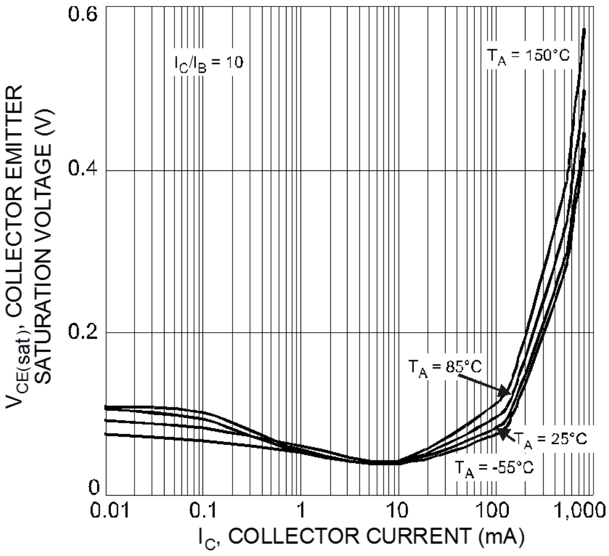


Figure 7. Typical Collector Emitter Saturation Voltage vs. Collector Current

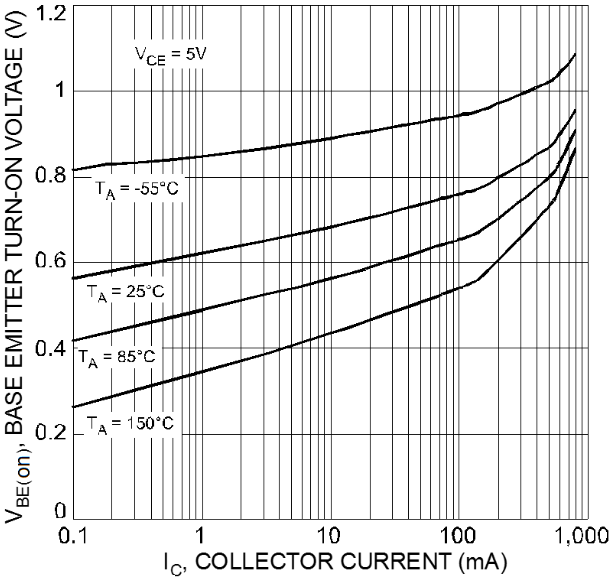


Figure 8. Typical Base Emitter Turn-On Voltage vs. Collector Current

Typical Electrical Characteristics (continued)

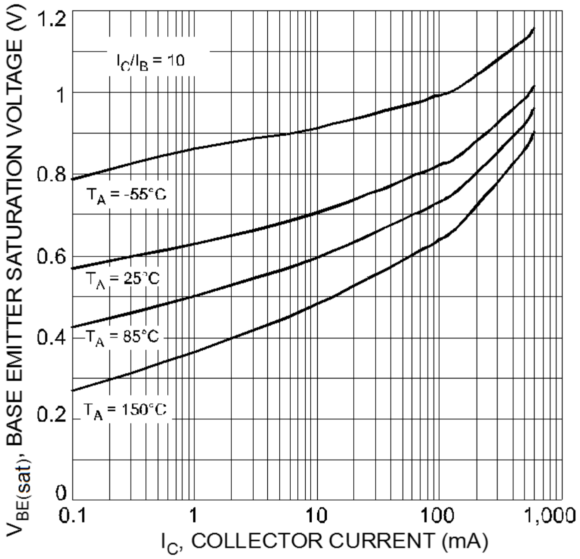


Figure 9. Typical Base Emitter Saturation Voltage vs. Collector Current

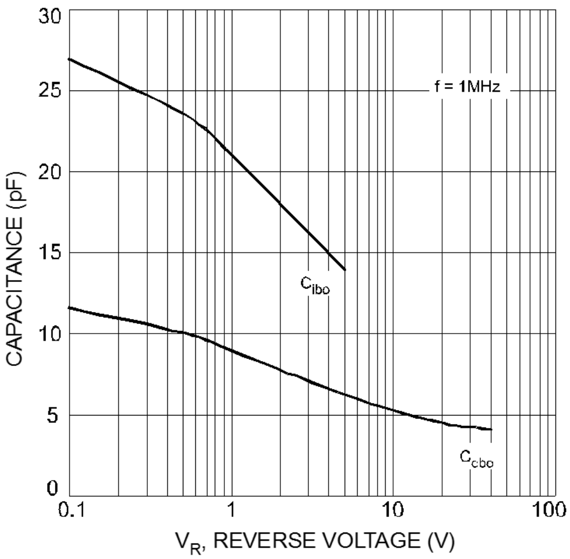


Figure 10. Typical Capacitance Characteristics

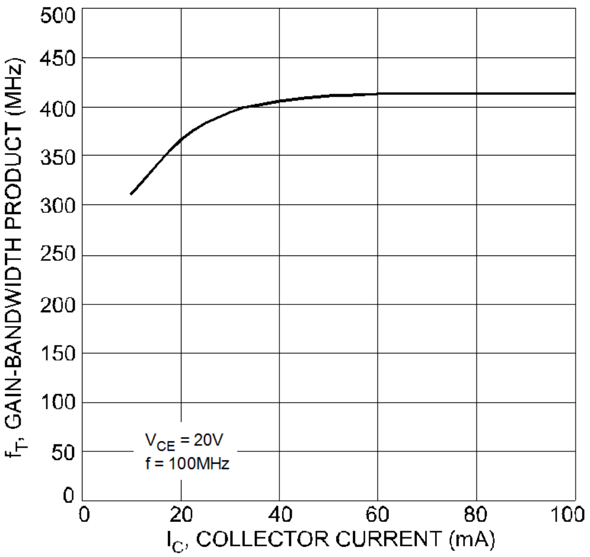
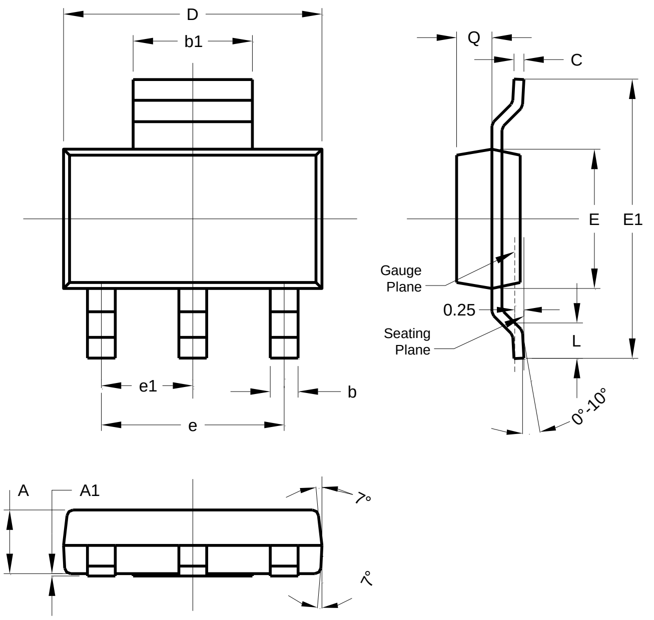


Figure 11. Typical Gain-Bandwidth Product vs. Collector Current

Package Outline Dimensions

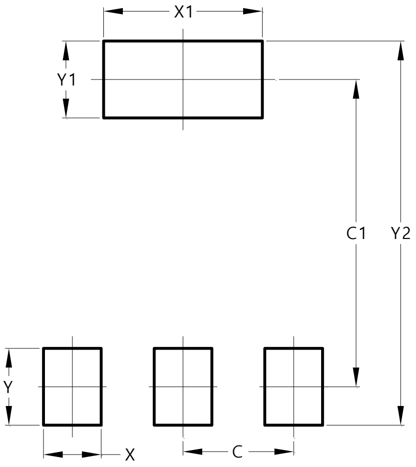
SOT223



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