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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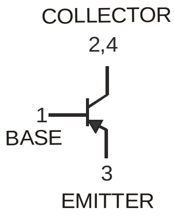
Features

- Ideally Suited for Automated Assembly Processes
- Low Collector-Emitter Saturation Voltage
- Ideal for Medium Power Switching or Amplification Applications

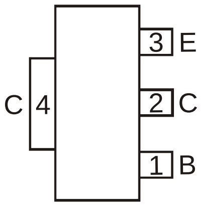
Mechanical Data

- Case: SOT-223
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020D
- Terminals: Finish — Matte Tin annealed over Copper leadframe (Lead Free Plating). Solderable per MIL-STD-202, Method 208
- Marking Information: See Page 4
- Ordering Information: See Page 4
- Weight: 0.115 grams (approximate)

Top View



Device Schematic



Pin Out Configuration

Maximum Ratings

@T_A = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	-45	V
Collector-Emitter Voltage	V_{CEO}	-30	V
Emitter-Base Voltage	V_{EBO}	-6	V
Peak Pulse Current	I_{CM}	-5	A
Continuous Collector Current	I_C	-3	A
Continuous Base Current	I_B	-1	A

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 3) @ T_A = 25°C	P_D	1.2	W
Thermal Resistance, Junction to Ambient Air (Note 3) @ T_A = 25°C	$R_{\theta JA}$	104	°C/W
Power Dissipation (Note 4) @ T_A = 25°C	P_D	2	W
Thermal Resistance, Junction to Ambient Air (Note 4) @ T_A = 25°C	$R_{\theta JA}$	62.5	°C/W
Power Dissipation @ T_C = 25°C	P_D	3	W
Thermal Resistance, Junction to Case @ T_C = 25°C	$R_{\theta JA}$	42	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Electrical Characteristics @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Conditions
OFF CHARACTERISTICS						
Collector-Emitter Breakdown Voltage (Note 5)	$V_{(BR)CEO}$	-30	—	—	V	I_C = -10mA
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	-6	—	—	V	I_E = -50μA
Collector-Base Cutoff Current	I_{CER}	—	—	-20	μA	V_{CB} = -25V, R_{BE} = 200Ω
		—	—	-200	μA	V_{CB} = -25V, R_{BE} = 200Ω, T_A = 125°C
Emitter-Base Cutoff Current	I_{EBO}	—	—	-10	μA	V_{EB} = -5V, I_C = 0
ON CHARACTERISTICS (Note 5)						
DC Current Gain	h_{FE}	125	—	—	—	V_{CE} = -1V, I_C = -0.8A
		110	—	—		V_{CE} = -1V, I_C = -1.2A
		90	—	—		V_{CE} = -1V, I_C = -3A
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	—	-100	-210	mV	I_C = -0.8A, I_B = -20mA
		—	—	-275		I_C = -1.2A, I_B = -20mA
		—	-250	-550		I_C = -3A, I_B = -300mA
Equivalent On-Resistance	$R_{CE(SAT)}$	—	83	183	mΩ	I_C = -3.0A, I_B = -300mA
Base-Emitter Saturation Voltage	$V_{BE(SAT)}$	—	—	-1.25	V	I_C = -3A, I_B = -300mA
Base-Emitter Turn-on Voltage	$V_{BE(ON)}$	—	—	-1.1	V	V_{CE} = -4V, I_C = -1.2A
SMALL SIGNAL CHARACTERISTICS						
Transition Frequency	f_T	—	160	—	MHz	V_{CE} = -10V, I_C = -100mA, f = 100MHz
Output Capacitance	C_{obo}	—	45	150	pF	V_{CB} = -10V, f = 1MHz
Input Capacitance	C_{ibo}	—	140	—	pF	V_{EB} = -8V, f = 1MHz
SWITCHING CHARACTERISTICS						
Turn-On Time	t_{on}	—	200	—	ns	V_{CC} = -15V, I_C = -1.2A, I_{B1} = -20mA
Delay Time	t_d	—	90	—	ns	
Rise Time	t_r	—	110	—	ns	
Turn-Off Time	t_{off}	—	155	—	ns	V_{CC} = -15V, I_C = -1.2A, I_{B1} = I_{B2} = -20mA
Storage Time	t_s	—	100	—	ns	
Fall Time	t_f	—	55	—	ns	

Notes: 5. Measured under pulsed conditions. Pulse width = 300μs. Duty cycle ≤2%.

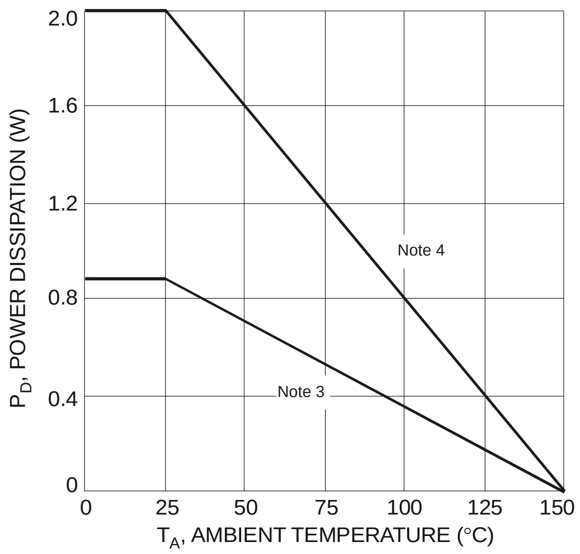


Fig. 1 Power Dissipation vs. Ambient Temperature

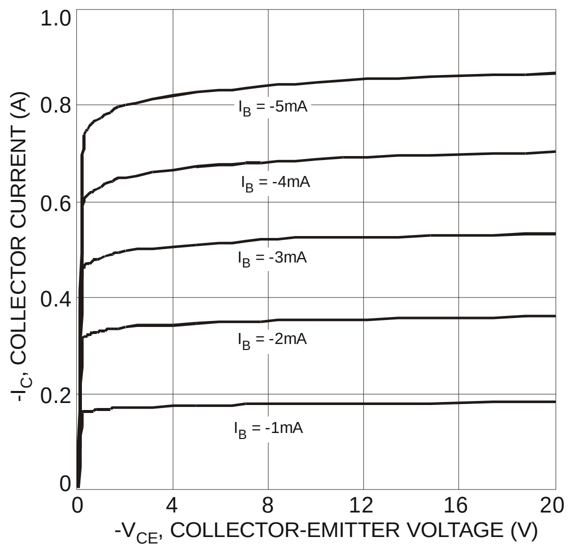


Fig. 2 Typical Collector Current
vs. Collector-Emitter Voltage

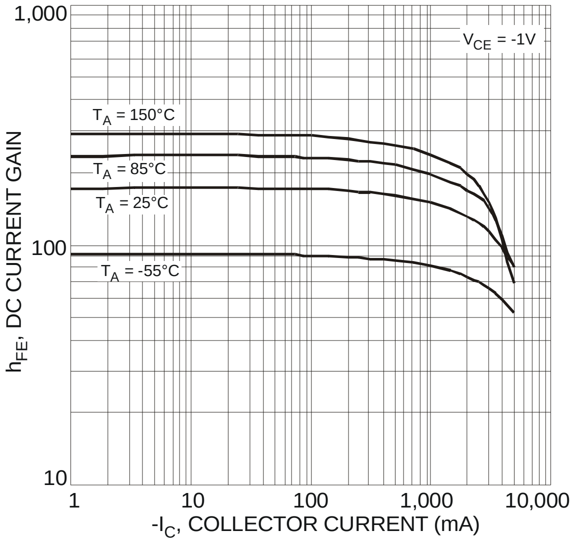


Fig. 3 Typical DC Current Gain vs. Collector Current

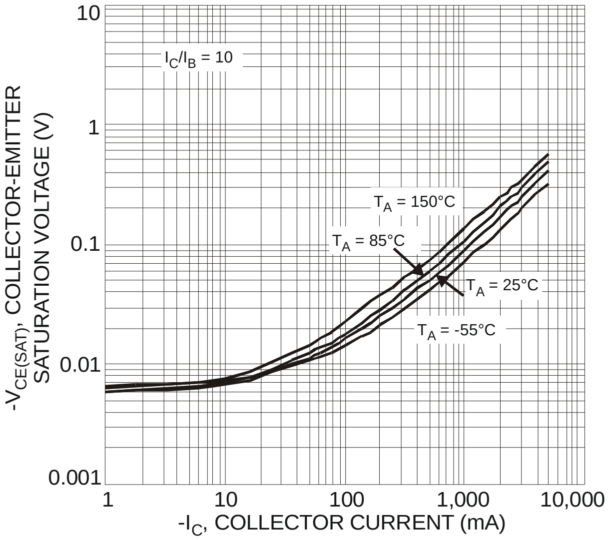


Fig. 4 Typical Collector-Emitter Saturation Voltage
vs. Collector Current

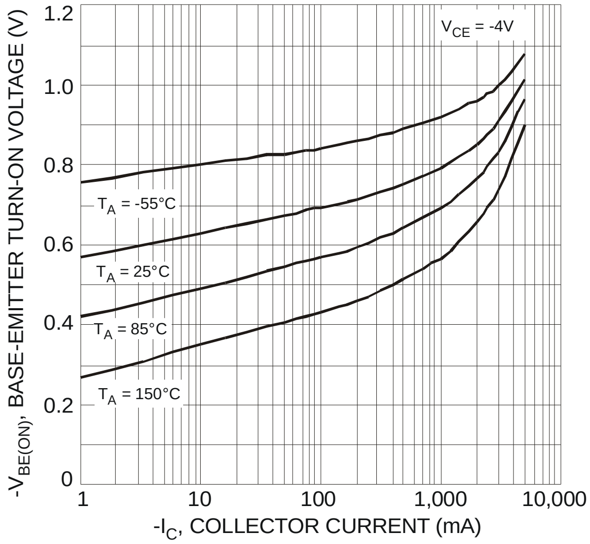


Fig. 5 Typical Base-Emitter Turn-On Voltage
vs. Collector Current

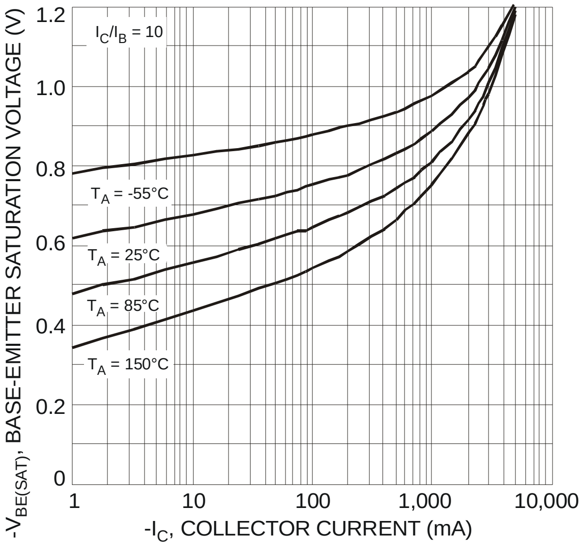


Fig. 6 Typical Base-Emitter Saturation Voltage
vs. Collector Current

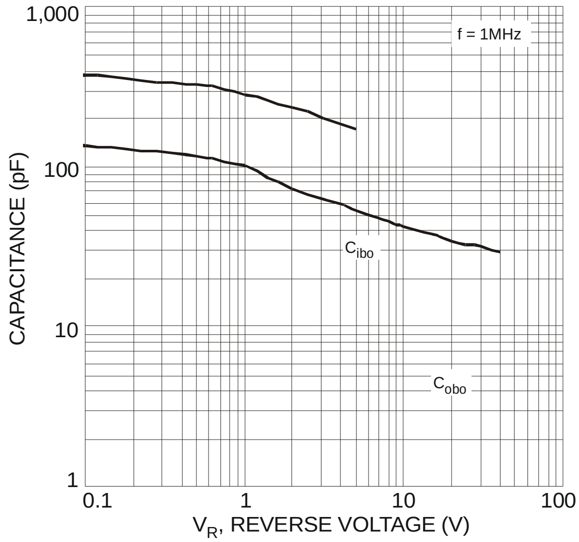


Fig. 7 Typical Capacitance Characteristics

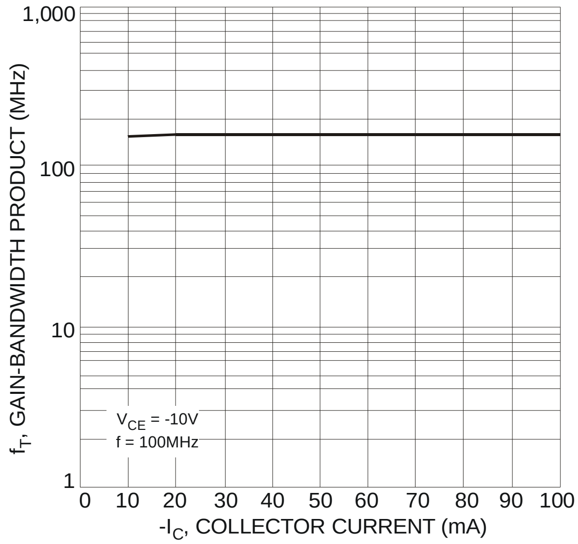
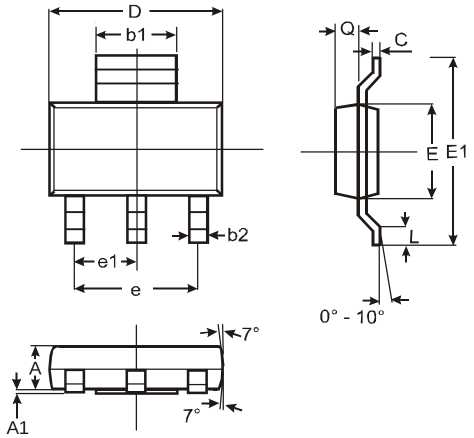


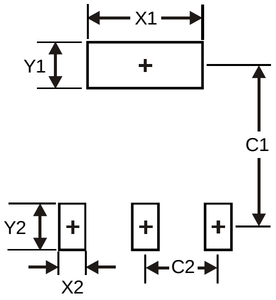
Fig. 8 Typical Gain-Bandwidth Product
vs. Collector Current

Package Outline Dimensions



SOT-223			
Dim	**Min**	**Max**	**Typ**
A	1.55	1.65	1.60
A1	0.010	0.15	0.05
b1	2.90	3.10	3.00
b2	0.60	0.80	0.70
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



Dimensions	Value (in mm)
X1	3.3
X2	1.2
Y1	1.6
Y2	1.6
C1	6.4
C2	2.3