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} > -20V
- I_C = -2.5A Continuous Collector Current
- I_{CM} = -6A Peak Pulse Current
- $R_{CE(sat)}$ = 96mΩ for a Low Equivalent On-Resistance
- Low Saturation Voltage (-220mV max @ -1A)
- h_{FE} Characterized Up to -6A for High Current Gain Hold-Up

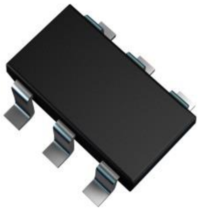
Mechanical Data

- Package: SOT26
- 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: 0.015 grams (Approximate)

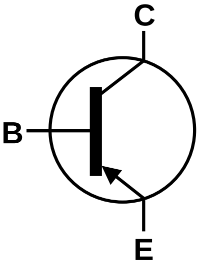
Applications

- DC-DC converters
- Power-management functions
- Power switches
- Motor controls

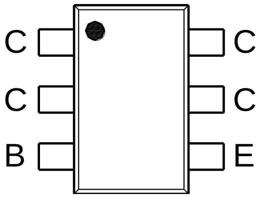
SOT26



Top View



Device Symbol



Pin-Out
Top View

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	-20	V
Collector-Emitter Voltage	V_{CEO}	-20	V
Emitter-Base Voltage	V_{EBO}	-7	V
Base Current	I_B	-500	mA
Continuous Collector Current	I_C	-2.5	A
Peak Pulse Collector Current	I_{CM}	-6	A

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

Characteristic		Symbol	Value	Unit
Power Dissipation Linear Derating Factor	(Note 5)	P_D	1.1 8.8	W mW/°C
	(Note 6)		1.7 13.6	W mW/°C
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\theta JA}$	113	°C/W
	(Note 6)		73	
Thermal Resistance, Junction to Case	(Note 5)	$R_{\theta JC}$	12	°C/W
Thermal Resistance, Junction to Leads	(Note 7)	$R_{\theta JL}$	30	°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	4000	V	3A
Electrostatic Discharge – Machine Model	ESD MM	400	V	C

Notes:

5. For a device mounted with collector leads on 25mm × 25mm 2oz copper that is on a single-sided 1.6mm FR-4 PCB; device is measured under still air conditions whilst operating in a steady state.
6. Same as Note 5, except the device is measured at t ≤ 5secs.
7. Thermal resistance from junction to solder-point (at the end of the collector leads).
8. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

Thermal Characteristics and Derating Information

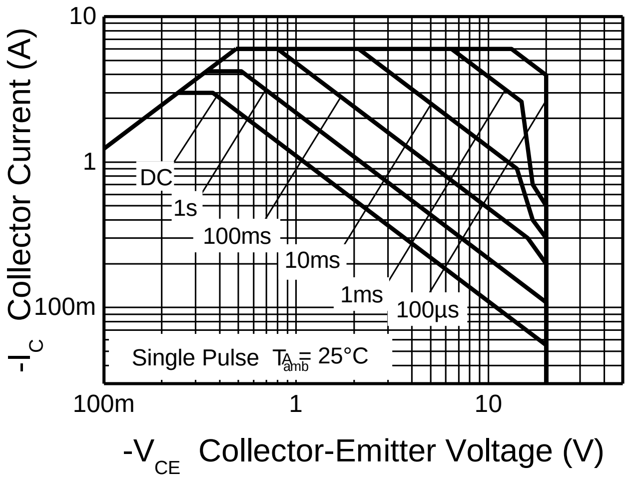


Figure 1. Safe Operating Area

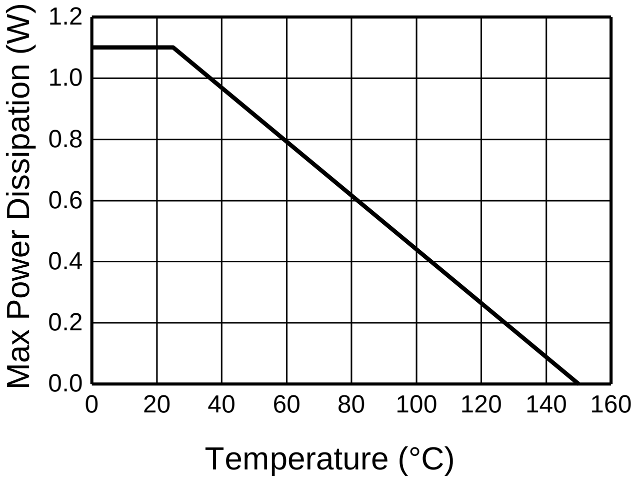


Figure 2. Derating Curve

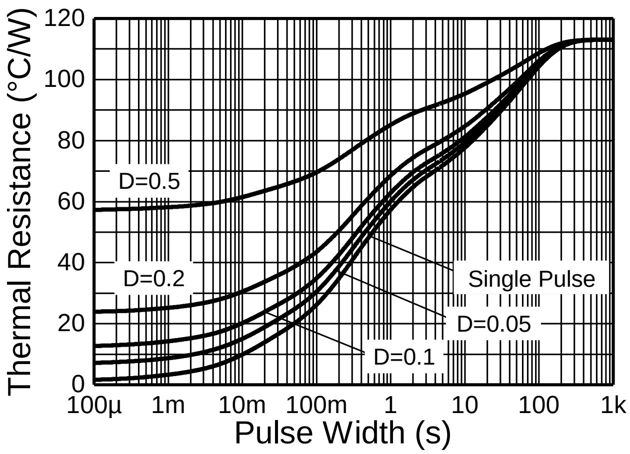


Figure 3. Transient Thermal Impedance

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Collector-Base Breakdown Voltage	BV_{CBO}	-20	-65	—	V	$I_C = -100\mu A$
Collector-Emitter Breakdown Voltage (Note 9)	BV_{CEO}	-20	-53	—	V	$I_C = -10mA$
Emitter-Base Breakdown Voltage	BV_{EBO}	-7	-8.8	—	V	$I_E = -100\mu A$
Collector-Base Cutoff Current	I_{CBO}	—	-1	-100	nA	$V_{CB} = -15V$
Emitter Cutoff Current	I_{EBO}	—	-1	-100	nA	$V_{EB} = -5V$
Collector-Emitter Cutoff Current	I_{CES}	—	-1	-100	nA	$V_{CES} = -15V$
ON CHARACTERISTICS (Note 9)						
DC Current Gain	h_{FE}	300	475	—	—	$I_C = -10mA$, $V_{CE} = -2V$
		300	450	—	—	$I_C = -0.1A$, $V_{CE} = -2V$
		150	230	—	—	$I_C = -2A$, $V_{CE} = -2V$
		15	30	—	—	$I_C = -6A$, $V_{CE} = -2V$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	—	-19	-30	mV	$I_C = -0.1A$, $I_B = -10mA$
		—	-170	-220		$I_C = -1A$, $I_B = -20mA$
		—	-190	-250		$I_C = -1.5A$, $I_B = -50mA$
		—	-240	-350		$I_C = -2.5A$, $I_B = -150mA$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	—	-0.97	-1.05	V	$I_C = -2.5A$, $I_B = -150mA$
Base-Emitter Turn-On Voltage	$V_{BE(on)}$	—	-0.85	-0.95	V	$I_C = -2.5A$, $V_{CE} = -2V$
SMALL SIGNAL CHARACTERISTICS						
Current Gain-Bandwidth Product	f_T	150	180	—	MHz	$V_{CE} = -10V$, $I_C = -50mA$, f = 100MHz
Output Capacitance	C_{obo}	—	21	30	pF	$V_{CB} = -10V$, f = 1MHz
Turn-On Time	$t_{(on)}$	—	40	—	ns	$V_{CC} = -10V$, $I_C = -1A$, $I_{B1} = -I_{B2} = -20mA$
Turn-Off Time	$t_{(off)}$	—	670	—	ns	

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

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

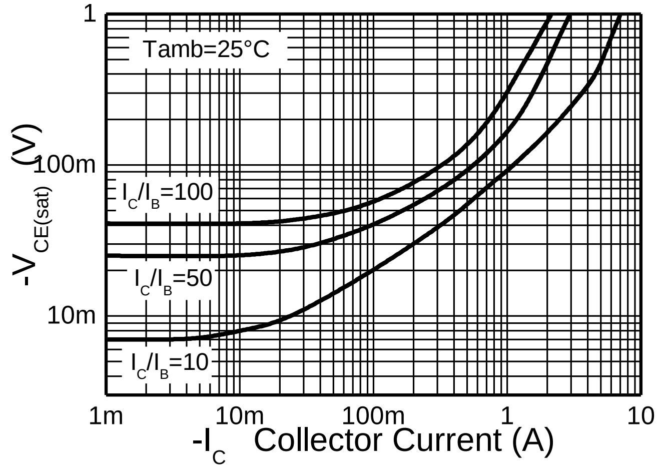


Figure 4. V$_{CE(sat)}$ vs. I$_C$

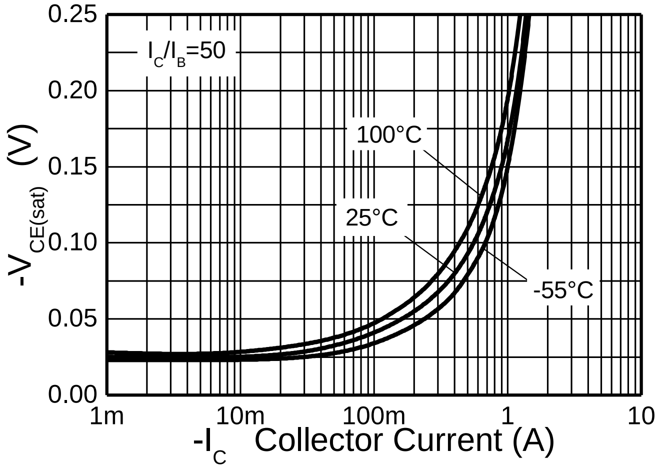


Figure 5. V$_{CE(sat)}$ vs. I$_C$

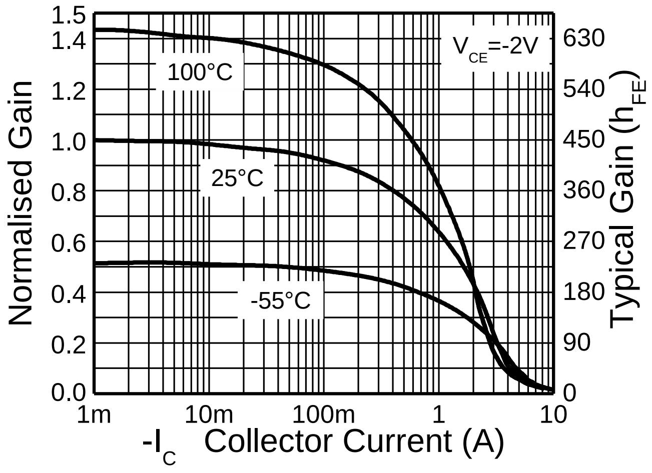


Figure 6. h$_{FE}$ vs. I$_C$

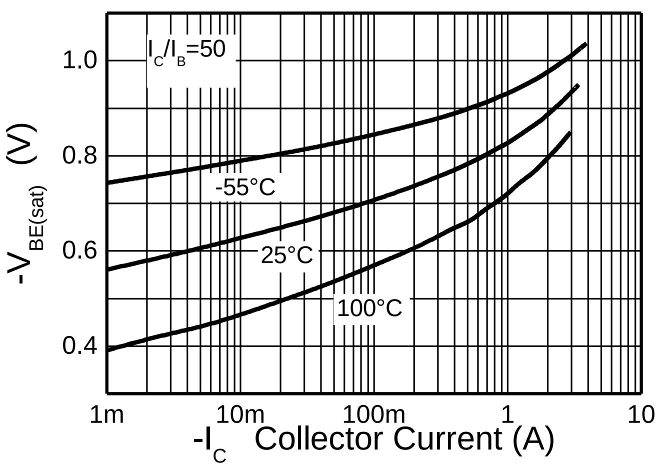


Figure 7. V$_{BE(sat)}$ vs. I$_C$

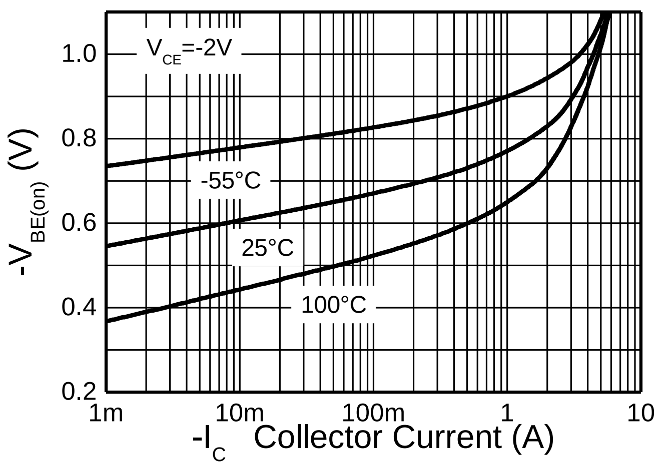
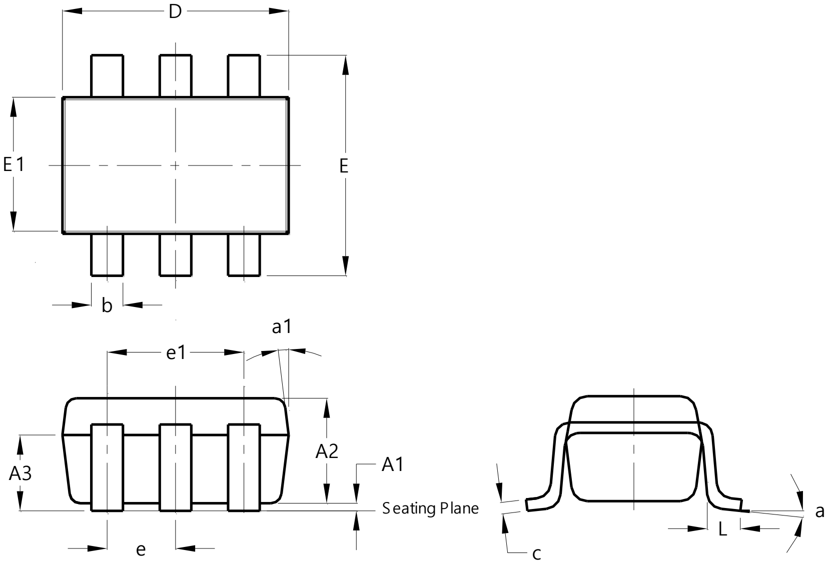


Figure 8. V$_{BE(on)}$ vs. I$_C$

Package Outline Dimensions

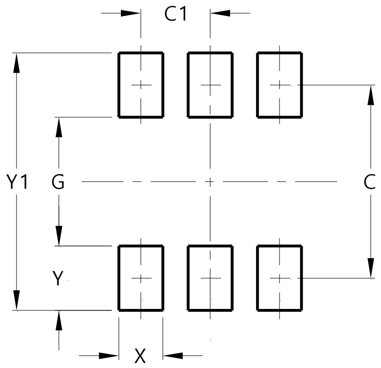
SOT26



SOT26			
Dim	**Min**	**Max**	**Typ**
A1	0.013	0.10	0.05
A2	1.00	1.30	1.10
A3	0.70	0.80	0.75
b	0.35	0.50	0.38
c	0.10	0.20	0.15
D	2.90	3.10	3.00
e	-	-	0.95
e1	-	-	1.90
E	2.70	3.00	2.80
E1	1.50	1.70	1.60
L	0.35	0.55	0.40
a	-	-	8°
a1	-	-	7°
All Dimensions in mm			

Suggested Pad Layout

SOT26



Dimensions	Value (in mm)
C	2.40
C1	0.95
G	1.60
X	0.55
Y	0.80
Y1	3.20