



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

0755-83047638

ysbdt@szyoushang.cn

www.szyoushang.cn



企业微信二维码



企业QQ二维码

Description

This bipolar junction transistor (BJT) is designed to meet the stringent requirements of automotive applications.

Features

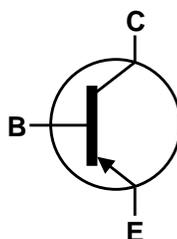
- $BV_{CEO} > -300V$
- $I_C = -200mA$ High Continuous Collector Current
- Complementary Type: NK-FMMTA42Q

Mechanical Data

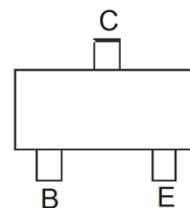
- Package: SOT23
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 ③
- Weight 0.008 grams (Approximate)



Top View



Device Symbol



Top View
Pin-Out

Absolute Maximum Ratings (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	-300	V
Collector-Emitter Voltage	V_{CEO}	-300	V
Emitter-Base Voltage	V_{EBO}	-5	V
Continuous Collector Current	I_C	-200	mA

Thermal Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Power Dissipation	P_D	0.31	W
		0.35	
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	403	$^\circ\text{C/W}$
		357	
Thermal Resistance, Junction to Lead	$R_{\theta JL}$	350	$^\circ\text{C/W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

ESD Ratings (Note 8)

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:
- For a device mounted on minimum recommended pad layout 1oz copper that is on a single-sided 1.6mm FR4 PCB; device is measured under still air conditions whilst operating in steady state condition.
 - Same as Note (5), except the device is mounted on 15mm x 15mm 1oz copper.
 - Thermal resistance from junction to solder-point (at the end of the collector lead).
 - Refer to JEDEC specification JESD22-A114 and JESD22-A115.

Thermal Characteristics and Derating Information

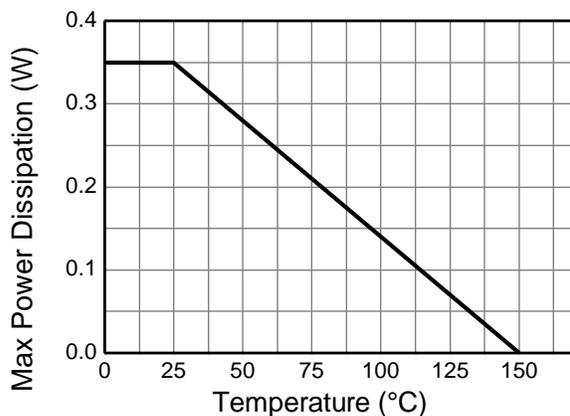


Figure 1. Derating Curve

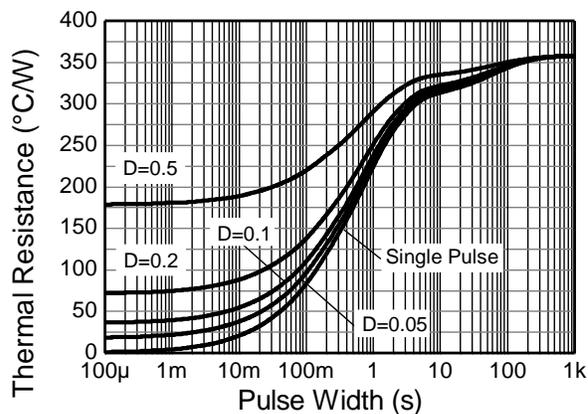


Figure 2. Transient Thermal Impedance

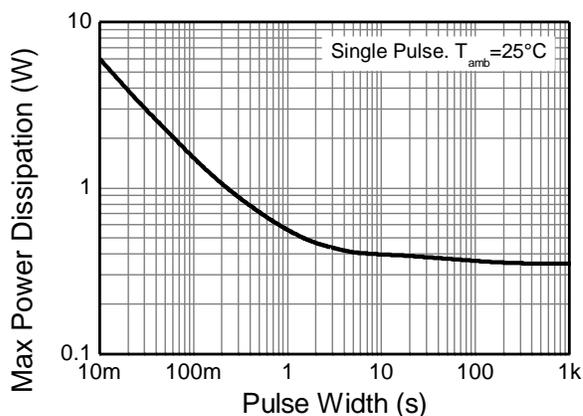


Figure 3. Pulse Power Dissipation

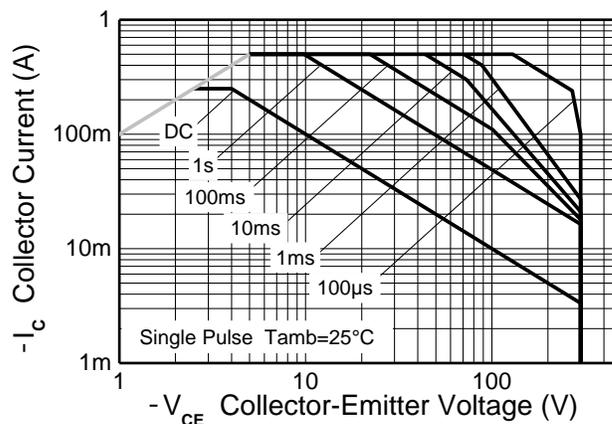


Figure 4. Safe Operating Area

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	-300	—	—	V	$I_C = -100\mu A$
Collector-Emitter Breakdown Voltage (Note 9)	BV_{CEO}	-300	—	—	V	$I_C = -1mA$
Emitter-Base Breakdown Voltage	BV_{EBO}	-5	—	—	V	$I_E = -100\mu A$
Collector Cutoff Current	I_{CES}	—	—	-250	nA	$V_{CE} = -200V$
Collector Cutoff Current	I_{CBO}	—	—	-250	nA	$V_{CB} = -200V$ $V_{CB} = -160V$
Emitter Cutoff Current	I_{EBO}	—	—	-100	nA	$V_{EB} = -3V$
Static Forward Current Transfer Ratio (Note 9)	h_{FE}	25 40 25	— — —	— — —	—	$I_C = -1mA, V_{CE} = -10V$ $I_C = -10mA, V_{CE} = -10V$ $I_C = -30mA, V_{CE} = -10V$
Collector-Emitter Saturation Voltage (Note 9)	$V_{CE(sat)}$	—	—	-0.5	V	$I_C = -20mA, I_B = -2mA$
Base-Emitter Saturation Voltage (Note 9)	$V_{BE(sat)}$	—	—	-0.9	V	$I_C = -20mA, I_B = -2mA$
Output Capacitance	C_{obo}	—	—	6	pF	$V_{CB} = -20V, f = 1MHz$
Transition Frequency	f_T	50	—	—	MHz	$V_{CE} = -20V, I_C = -10mA,$ $f = 20MHz$

 Note: 9. Measured under pulsed conditions. Pulse width $\leq 300\mu s$. Duty cycle $\leq 2\%$

Typical Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

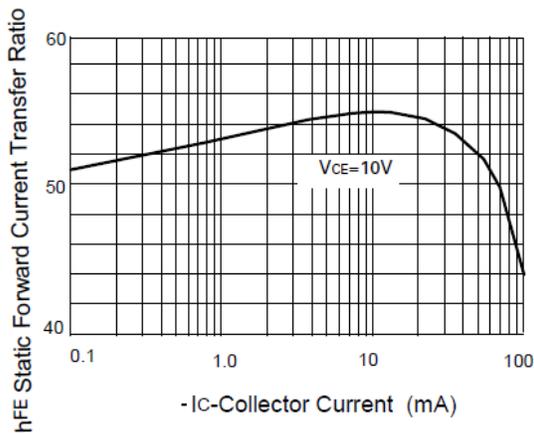


Figure 5. h_{FE} vs I_C

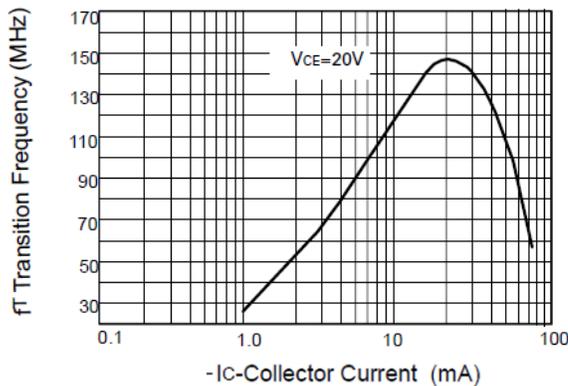


Figure 6. f_T vs I_C

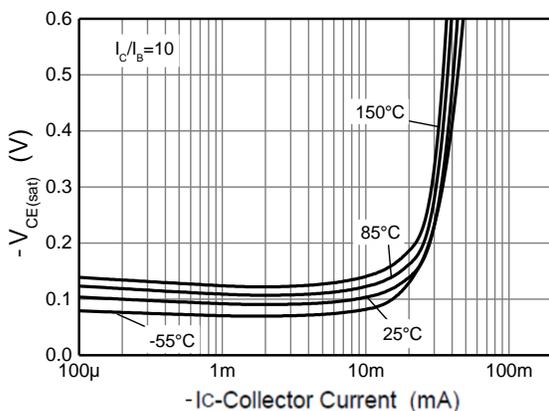


Figure 7. $V_{CE(sat)}$ v I_C

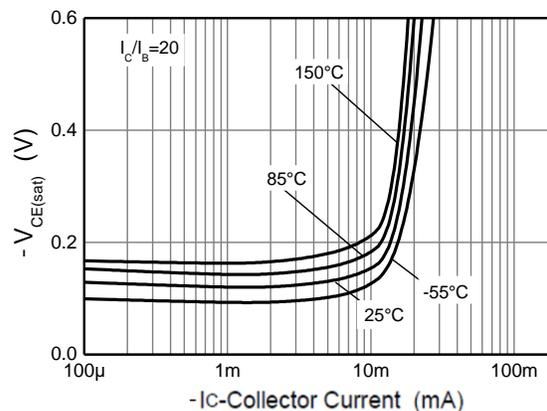


Figure 8. $V_{CE(sat)}$ v I_C

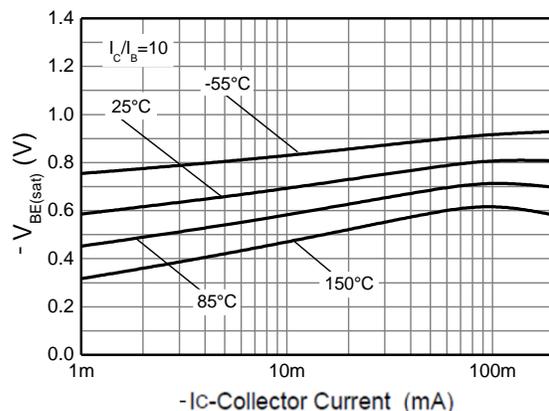


Figure 9. $V_{BE(sat)}$ v I_C

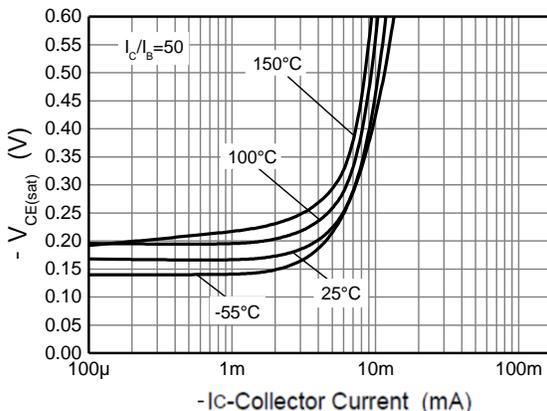
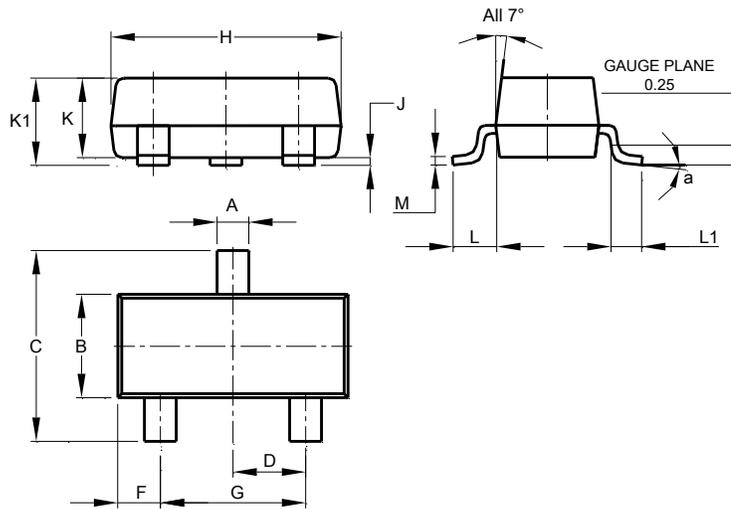


Figure 10. $V_{CE(sat)}$ v I_C

Package Outline Dimensions

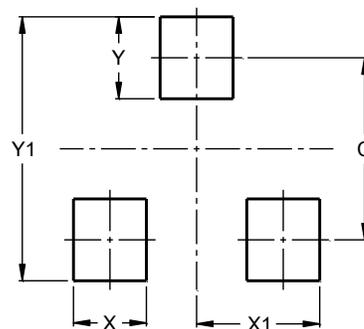
SOT23



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

Note: For high voltage applications, the appropriate industry sector guidelines should be considered with regards to creepage and clearance distances between device Terminals and PCB tracking.