



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



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## Features

- $BV_{CEO} > 50V$
- $I_C = 150mA$  High Collector Current
- Ultra-Small Surface Mount Package
- Complementary PNP Type Available (2DA1774Q/R/S)

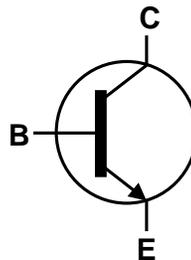
## Mechanical Data

- Case: SOT523
- 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  $\text{e3}$
- Weight: 0.002 grams (Approximate)

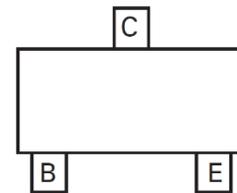
SOT523



Top View



Device Symbol



Pin-Out Top View

**Maximum Ratings** @  $T_A = 25^\circ\text{C}$  unless otherwise specified

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	$V_{CBO}$	60	V
Collector-Emitter Voltage	$V_{CEO}$	50	V
Emitter-Base Voltage	$V_{EBO}$	7	V
Collector Current—Continuous (Note 5)	$I_C$	150	mA

**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5) $T_A = 25^\circ\text{C}$	$P_D$	150	mW
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	833	$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$

**ESD Ratings** (Note 6)

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:
- For a device mounted with the collector lead, on a minimum recommended pad layout of 1oz copper on a single-sided 1.6mm FR4 PCB. Device is measured under still air conditions whilst operating in a steady-state.
  - Refer to JEDEC specification JESD22-A114 and JESD22-A115.

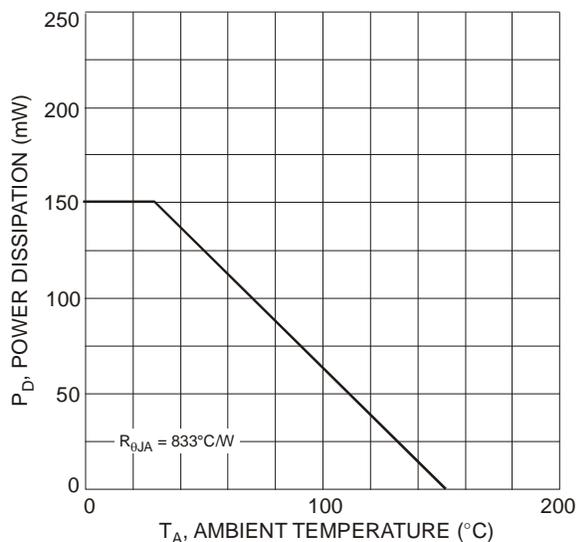
**Thermal Characteristics and Derating Information**


Fig. 1 Power Dissipation vs. Ambient Temperature (Note 1)

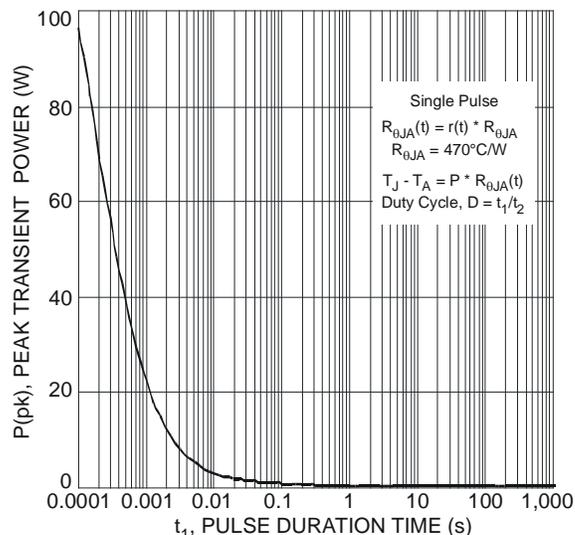


Fig. 2 Single Pulse Maximum Power Dissipation

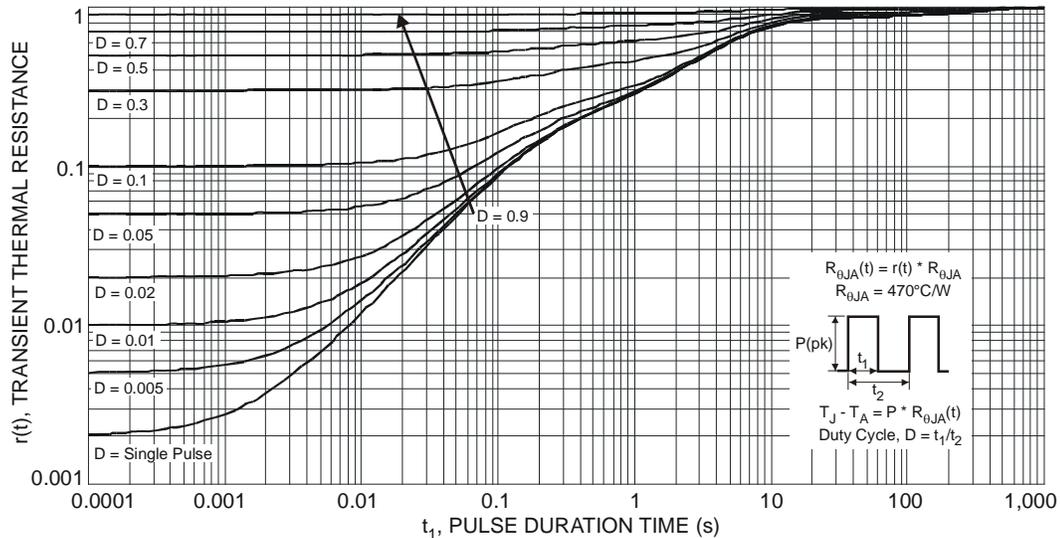
**Thermal Characteristics and Derating Information** (continued)


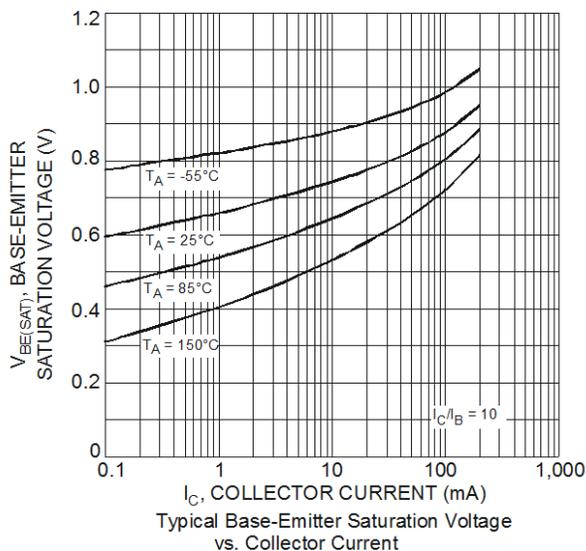
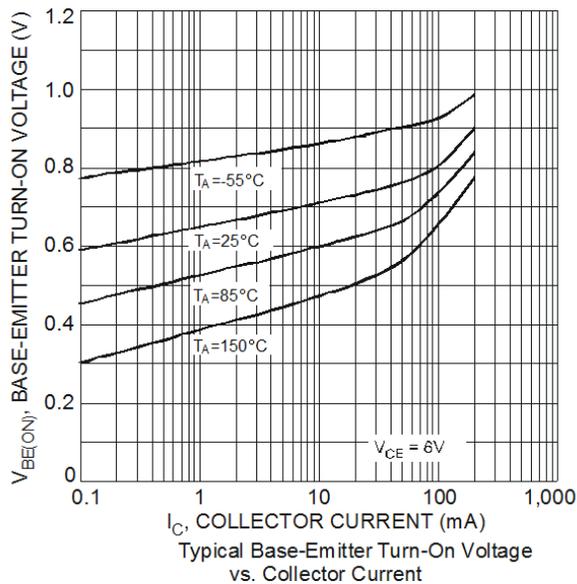
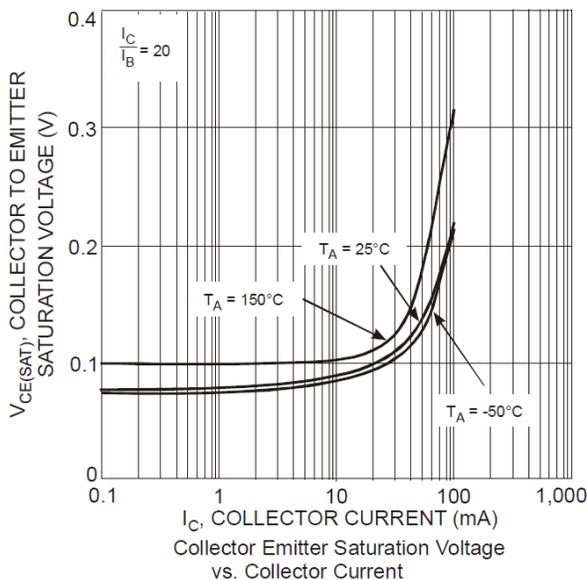
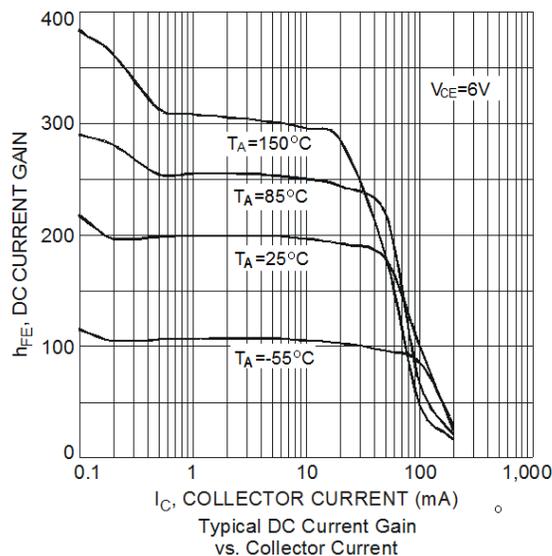
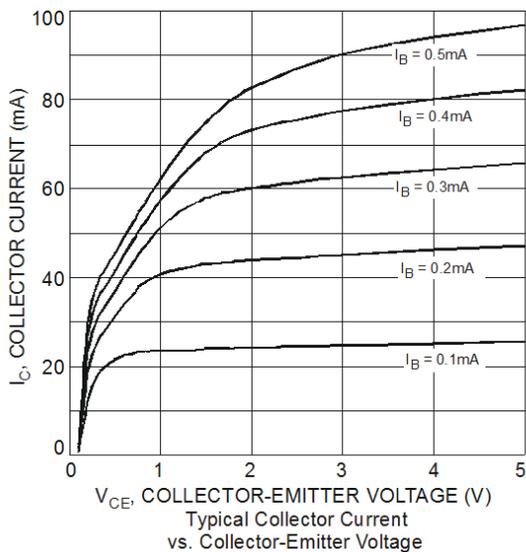
Fig. 3 Transient Thermal Response

**Electrical Characteristics** @ $T_A = 25^\circ\text{C}$  unless otherwise specified

Characteristic	Symbol	Min	Typ.	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 7)</b>						
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	60	—	—	V	$I_C = 50\mu\text{A}, I_E = 0$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	50	—	—	V	$I_C = 1\text{mA}, I_B = 0$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	7	—	—	V	$I_E = 50\mu\text{A}, I_C = 0$
Collector Cutoff Current	$I_{CBO}$	—	—	100	nA	$V_{CB} = 60\text{V}$
Emitter Cutoff Current	$I_{EBO}$	—	—	100	nA	$V_{EB} = 6\text{V}$
<b>ON CHARACTERISTICS (Note 7)</b>						
DC Current Gain	NK-2DC4617Q NK-2DC4617R NK-2DC4617S	120 180 270	— — —	270 390 560	—	$V_{CE} = 6\text{V}, I_C = 1\text{mA}$
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	—	—	0.4	V	$I_C = 50\text{mA}, I_B = 5\text{mA}$
<b>SMALL SIGNAL CHARACTERISTICS</b>						
Output Capacitance	$C_{obo}$	—	2	3.5	pF	$V_{CB} = 12\text{V}, f = 1\text{MHz}, I_E = 0$
Current Gain-Bandwidth Product	$f_T$	—	140	—	MHz	$V_{CE} = 12\text{V}, I_C = 2\text{mA}, f = 1\text{MHz}$
Current Gain-Bandwidth Product	$f_T$	—	180	—	MHz	$V_{CE} = 12\text{V}, I_C = 0\text{mA}, f = 1\text{MHz}$
Current Gain-Bandwidth Product	$f_T$	—	180	—	MHz	$V_{CE} = 12\text{V}, I_C = 2\text{mA}, f = 100\text{MHz}$

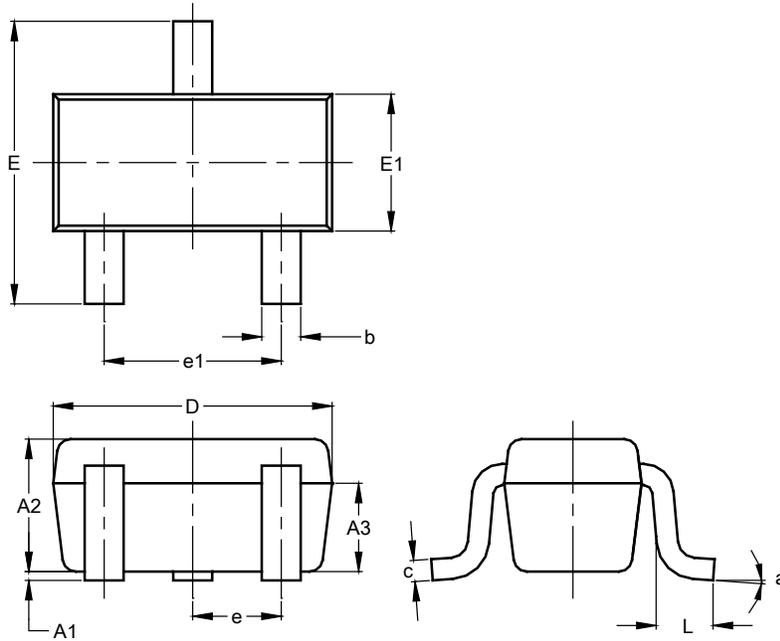
 Notes: 7. Measured under pulsed conditions. Pulse width  $\leq 300\mu\text{s}$ . Duty cycle  $\leq 2\%$ .

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



## Package Outline Dimensions

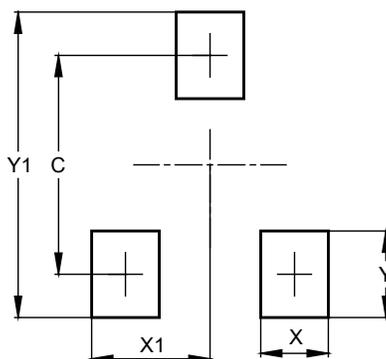
SOT523



SOT523			
Dim	Min	Max	Typ
A1	0.00	0.10	0.05
A2	0.60	0.80	0.75
A3	0.45	0.65	0.50
b	0.15	0.30	0.22
c	0.10	0.20	0.12
D	1.50	1.70	1.60
E	1.45	1.75	1.60
E1	0.75	0.85	0.80
e	0.50 BSC		
e1	0.90	1.10	1.00
L	0.20	0.40	0.33
a	0°	--	8°
All Dimensions in mm			

## Suggested Pad Layout

SOT523



Dimensions	Value (in mm)
C	1.29
X	0.40
X1	0.70
Y	0.51
Y1	1.80