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

0755-83047638
ysbdt@szyoushang.cn
www.szyoushang.cn

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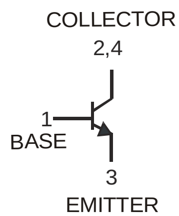
Features

- Ideally Suited for Automated Assembly Processes
- Complementary PNP Type Available (NK-DJT4030P)
- Low Collector-Emitter Saturation Voltage
- Ideal for Medium Power Switching or Amplification Applications

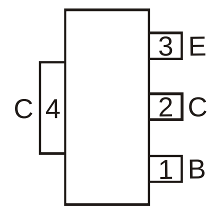
Mechanical Data

- 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}	40	V
Collector-Emitter Voltage	V_{CEO}	40	V
Emitter-Base Voltage	V_{EBO}	6	V
Peak Pulse Current	I_{CM}	5	A
Continuous Collector Current	I_C	3	A
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
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 (Note 4)						
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	40	—	—	V	I_C = 100µA
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	40	—	—	V	I_C = 10mA
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	6	—	—	V	I_E = 50µA
Collector-Base Cutoff Current	I_{CBO}	—	—	100	nA	V_{CB} = 40V, I_E = 0
		—	—	50	µA	V_{CB} = 40V, I_E = 0, T_A = 150°C
Emitter-Base Cutoff Current	I_{EBO}	—	—	100	nA	V_{EB} = 6V, I_C = 0
ON CHARACTERISTICS (Note 4)						
DC Current Gain	h_{FE}	220	—	—	—	V_{CE} = 1V, I_C = 0.5A
		200	—	500		V_{CE} = 1V, I_C = 1A
		100	—	—		V_{CE} = 1V, I_C = 3A
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	—	—	100	mV	I_C = 0.5A, I_B = 5mA
		—	—	150		I_C = 1A, I_B = 10mA
		—	—	300		I_C = 3A, I_B = 0.3A
Equivalent On-Resistance	$R_{CE(SAT)}$	—	—	100	mΩ	I_E = 3A, I_B = 0.3A
Base-Emitter Saturation Voltage	$V_{BE(SAT)}$	—	—	1.0	V	I_C = 1A, I_B = 0.1A
Base-Emitter Turn-on Voltage	$V_{BE(ON)}$	—	—	1.0	V	V_{CE} = 2V, I_C = 1A
SMALL SIGNAL CHARACTERISTICS						
Transition Frequency	f_T	—	105	—	MHz	V_{CE} = 10V, I_C = 100mA, f = 100MHz
Output Capacitance	C_{obo}	—	27	—	pF	V_{CB} = 10V, f = 1MHz
Input Capacitance	C_{Ibo}	—	180	—	pF	V_{CB} = 5V, f = 1MHz
SWITCHING CHARACTERISTICS						
Turn-On Time	t_{on}	—	45	—	ns	V_{CC} = 10V, I_C = 2A, I_{B1} = 200mA
Delay Time	t_d	—	14	—	ns	
Rise Time	t_r	—	31	—	ns	
Turn-Off Time	t_{off}	—	276	—	ns	V_{CC} = 10V, I_C = 2A, I_{B1} = I_{B2} = 200mA
Storage Time	t_s	—	244	—	ns	
Fall Time	t_f	—	32	—	ns	

Notes: 4. Measured under pulsed conditions. Pulse width = 300µs. Duty cycle ≤2%.

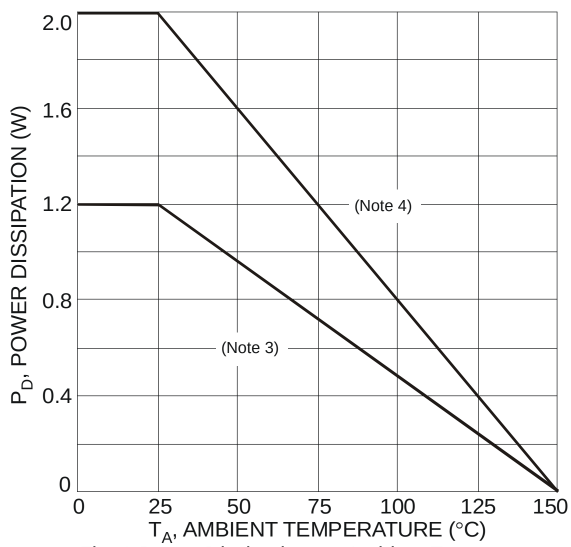


Fig. 1 Power Dissipation vs. Ambient Temperature

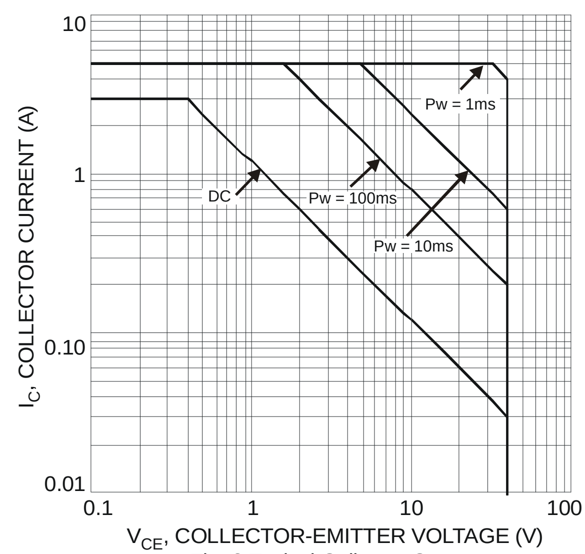


Fig. 2 Typical Collector Current vs. Collector-Emitter Voltage (Note 3)

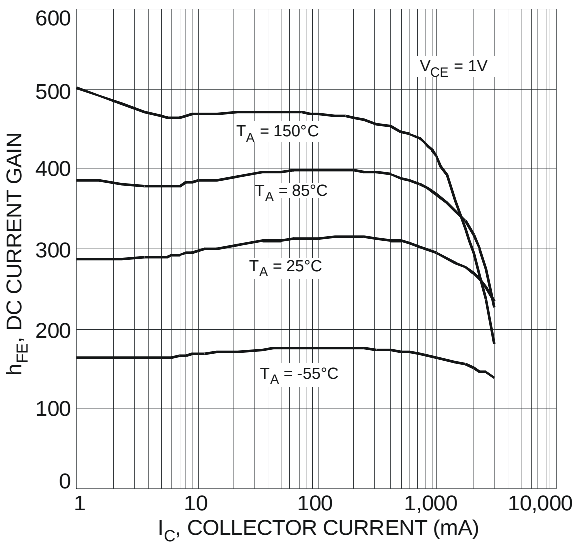


Fig. 3 Typical DC Current Gain vs. Collector Current

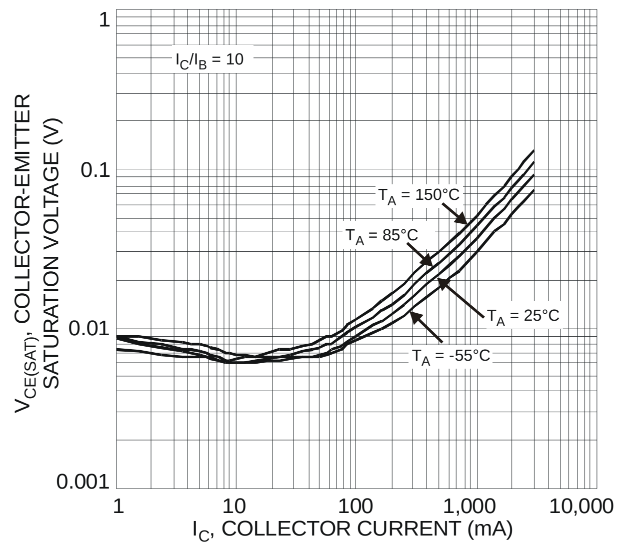


Fig. 4 Typical Collector-Emitter Saturation Voltage vs. Collector Current

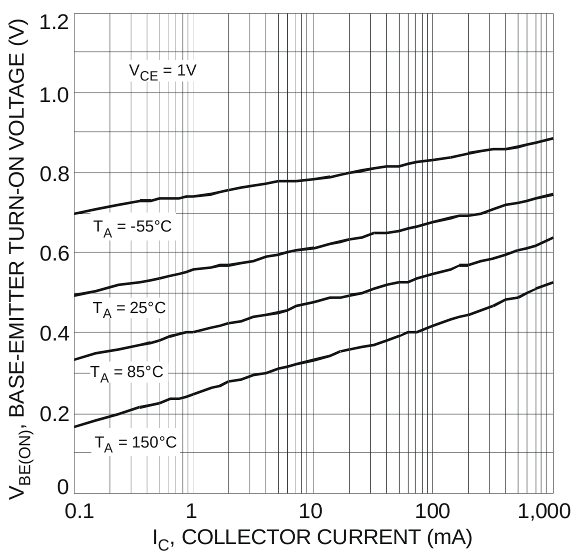


Fig. 5 Typical Base-Emitter Turn-On Voltage vs. Collector Current

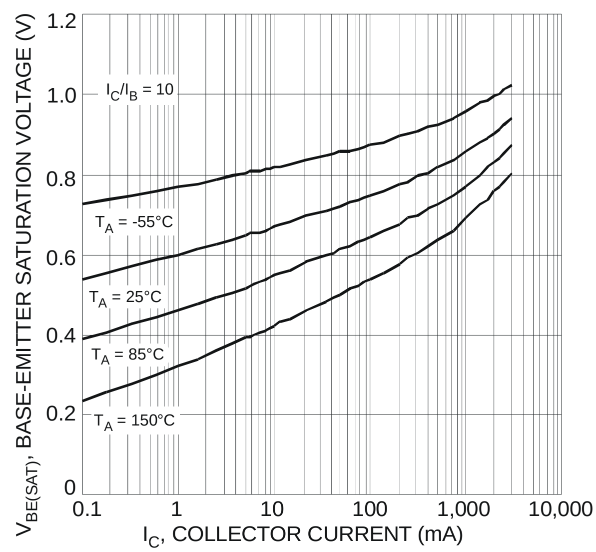


Fig. 6 Typical Base-Emitter Saturation Voltage vs. Collector Current

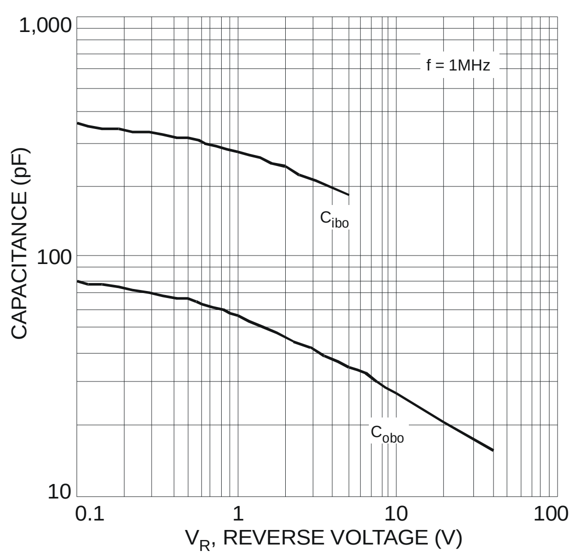


Fig. 7 Typical Capacitance Characteristics

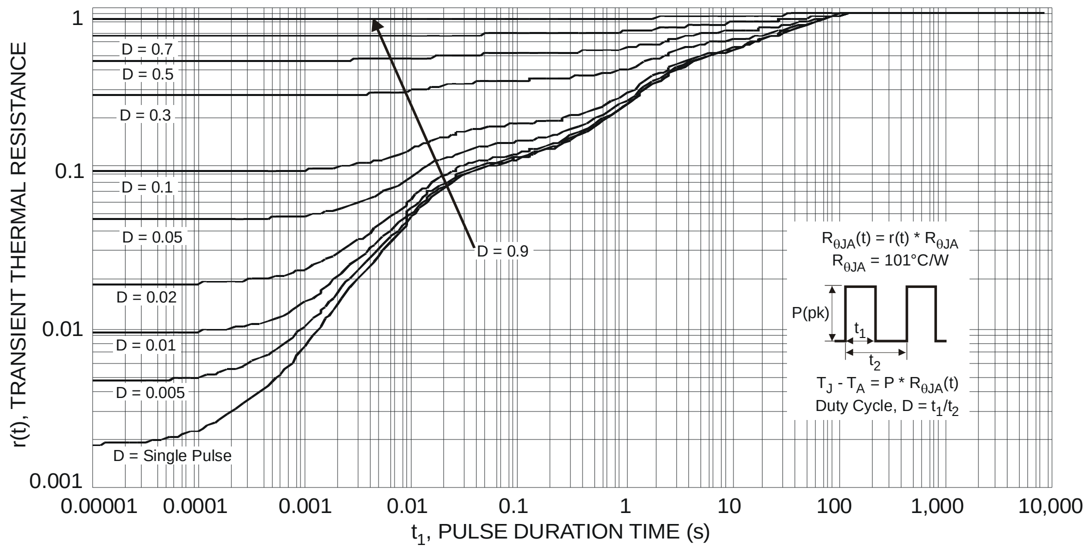
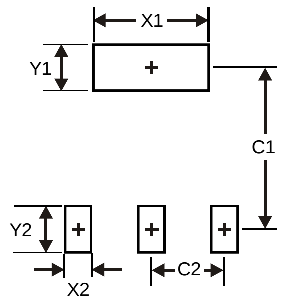


Fig. 8 Transient Thermal Response (Note 3)

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