



Solid State Devices, Inc.

14701 Firestone Blvd * La Mirada, CA 90638
Phone: (562) 404-4474 * Fax: (562) 404-1773
ssdi@ssdi-power.com * www.ssdi-power.com

DESIGNER'S DATA SHEET

Part Number / Ordering Information ^{1/}

SFT6678 M TX

Screening ^{2/} = Not Screened
TX = TX Level
TXV = TXV Level
S = S Level

Lead Bend ^{3/} = Straight Leads
UB = Up Bend
DB = Down Bend

Package M = TO-254
Z = TO-254Z
/3 = TO-3

SFT6678 SERIES

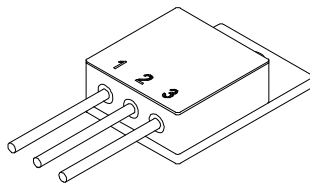
**15 AMPS
400 Volts
NPN High Speed
Power Transistor**

Application Notes:

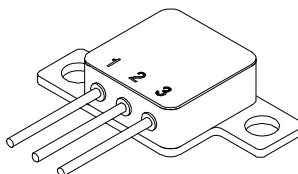
- Replaces Industry Standard 2N6678
- Designed for High Voltage, High Speed, Power Switching Applications Such as:
- Off-Line Supplies
- Converter Circuits
- Pulse Width Modulated Regulators
- Motor Controls
- Deflection Circuits

Maximum Ratings	Symbol	Value	Units
Collector – Emitter Voltage	V_{CEO}	400	Volts
Collector – Base Voltage	V_{CBO}	650	Volts
Emitter – Base Voltage	V_{EBO}	8.0	Volts
Continuous Collector Current	I_C	15	Amps
Continuous Base Current	I_B	5.0	Amps
Operating and Storage Temperature	T_J, T_{STG}	-65 to +200	°C
Total Power Dissipation @ $T_C=25^{\circ}C$ Derate above 25°C	P_D	175 1.0	W W/°C
Maximum Thermal Resistance (Junction to Case) (Ambient to Case)	$R_{\theta JC}$ $R_{\theta JA}$	1.0 29.17	°C/W

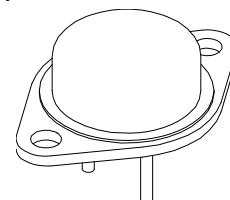
TO-254 (M)



TO-254 (Z)



TO-3 (/3)



NOTES:

* Pulse Test: Pulse Width = 300 μ s, Duty Cycle $\leq$ 2%

^{1/} For ordering information, price, and availability contact factory.

^{2/} Screening based on MIL-PRF-19500. Screening flows available on request.

^{3/} Up and down bend configurations available for M and Z (TO-254 and TO-254Z) packages only.

^{4/} All electrical characteristics @ 25°C, unless otherwise specified.

NOTE: All specifications are subject to change without notification.
SCD's for these devices should be reviewed by SSDI prior to release.

DATA SHEET #: TR0019E

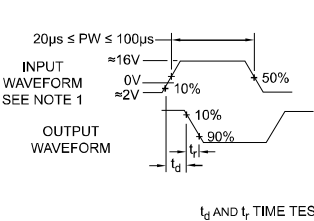
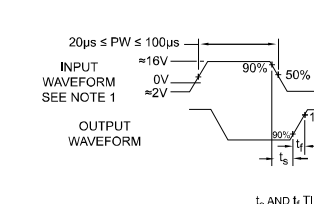
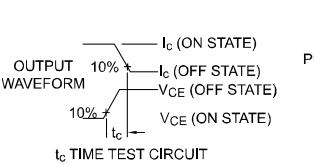
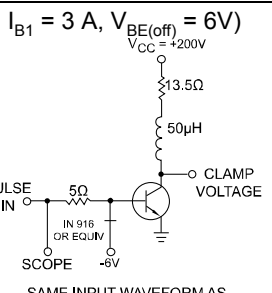
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Electrical Characteristics			Symbol	Min	Max	Units	
Collector Cutoff Current	$V_{CE} = 400V, V_{BE(off)} = 1.5V$	$T_C = 25^{\circ}C$	I_{CEV}	-	0.5	μA	
	$V_{CE} = 650V, V_{BE(off)} = 1.5V$	$T_C = 25^{\circ}C$		-	1.0	μA	
	$V_{CE} = 650V, V_{BE(off)} = 1.5V$	$T_C = 125^{\circ}C$		-	50	μA	
Collector – Base Leakage Current		$V_{CB} = 650V$	I_{CBO}	-	1	mA	
Emitter Cutoff Current		$V_{EB} = 8V, I_C = 0$	I_{EBO}	-	2	mA	
Collector-Emitter Sustaining Voltage		$I_C = 200mA, I_B = 0$	$V_{CEO(sus)}$	400	-	V	
DC Current Gain*	$V_{CE} = 3V, 1_C = 15A, T_A = 25^{\circ}C$	H_{FE1} H_{FE2} H_{FE3}		8	20		
	$V_{CE} = 3V, 1_C = 1A, T_A = 25^{\circ}C$			15	40		
	$V_{CE} = 3V, 1_C = 15A, T_A = -55^{\circ}C$			4	-		
Base-Emitter Saturation Voltage*		$I_C = 15A, I_B = 3A$	$V_{BE(SAT)}$	-	1.5	V	
Collector-Emitter Saturation Voltage* ($I_C = 15A, I_B = 3A$)		$T_C = 25^{\circ}C$	$V_{CE(SAT)}$	-	1.0	V	
		$T_C = 125^{\circ}C$		-	2.0		
Current Gain		$I_C = 1A, V_{CE} = 10V, f = 5MHz$	$ h_{FE} $	3	10		
Output Capacitance		$V_{CB} = 10V, f = 1MHz$	C_{ob}	150	500	pF	
Delay Time	($V_{CC} = 200V, I_C = 15A, I_{B1} = I_{B2} = 3A, t_p = 50 \mu sec$, Duty Cycle $\leq 2\%$, $V_B = 6V, R_L = 13.5\Omega$)  t_d AND t_r TIME TEST CIRCUIT		$t_{(on)}$	t_d	-	0.1	μsec
Rise Time				t_r	-	0.6	
Storage Time	 t_s AND t_f TIME TEST CIRCUIT		$t_{(off)}$	t_s	-	2.5	
Fall Time				t_f	-	0.5	
Cross Over Time	($I_C = 15 A(pk), V_{CLAMP} = 450V, I_{B1} = 3 A, V_{BE(off)} = 6V$)  t_c TIME TEST CIRCUIT  SAME INPUT WAVEFORM AS t_s AND t_f TIME TEST CIRCUIT		t_c	-	5.0	μsec	
Safe Operating Area, DC		$V_{CE} = 11.7 V, I_C = 15 A, 1 sec$ $V_{CE} = 30 V, I_C = 5.4 A, 1 sec$ $V_{CE} = 100 V, I_C = 0.25 A, 1 sec$ $V_{CE} = 400 V, I_C = 10 mA, 1 sec$					
Safe Operating Area, clamped switching		$V_{CC} = 15 V, V_{BB2} = 5 V, R_{BB1} = 5 \Omega, R_{BB2} = 1.5\Omega, L = 50\mu H,$ $V_{clamp} = 450V, I_C = 15 A$					

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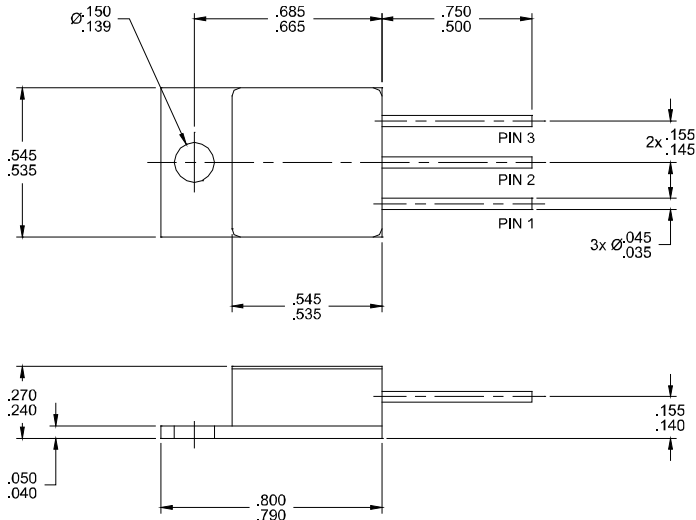


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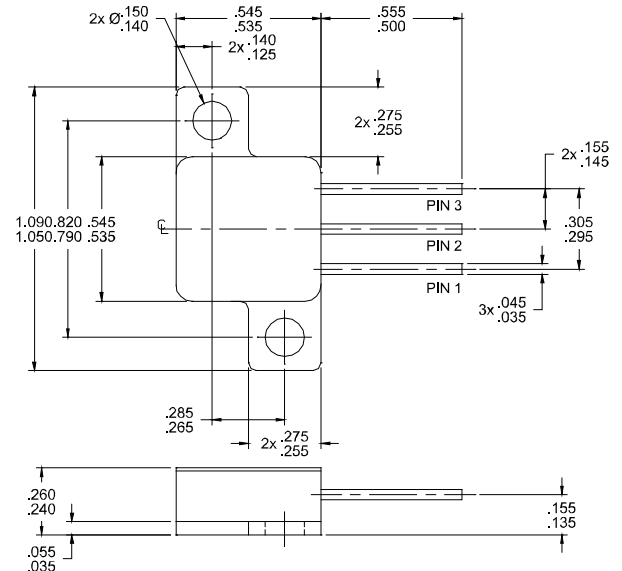
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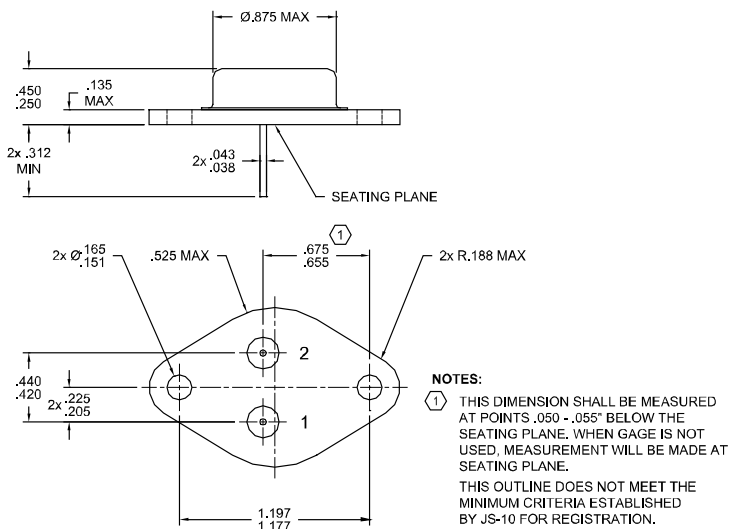
Case Outline: TO-254



Case Outline: TO-254Z

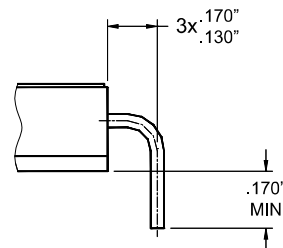


Case Outline: TO-3

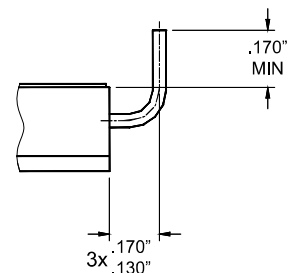


Lead Options

DB (Down Bend)



UB (Up Bend)



PIN ASSIGNMENT (Standard)

Package	Collector	Emitter	Base
TO-3 (/3)	Case	Pin 2	Pin 1
TO-254 (M)	Pin 1	Pin 2	Pin 3
TO-254 (Z)	Pin 1	Pin 2	Pin 3

Available Part Numbers:

SFT6678/3	SFT6678M SFT6678MDB SFT6678MUB	SFT6678Z SFT6678ZDB SFT6678ZUB
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