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

SFT6678 SERIES

15 AMPS
400 Volts
NPN High Speed
Power Transistor

DESIGNER'S DATA SHEET

Part Number / Ordering Information 1/

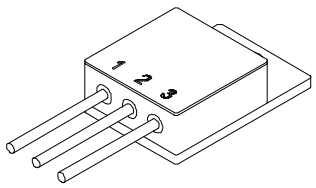
SFT6678 M __ TX

- **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

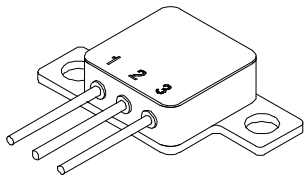
Application Notes:
- **Replaces Industry Standard 2N6678**
- **Designed for High Voltage, High Speed, Power Switching Applications Such as:**
- **Off-Line Supplies**
- **Converter Circuits**
- **Pulse Width Modulated Regulators**
- **Motor Controls**
- **Deflection Circuits**

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°C @ T_A=25°C	P_D	175 6.0	**W** **W**
Maximum Thermal Resistance (Junction to Case) (Ambient to Case)	$R_{\theta JC}$ $R_{\theta JA}$	1.0 29.17	**ºC/W**

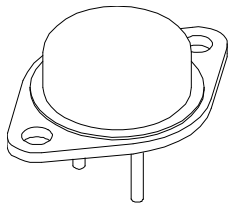
TO-254 (M)



TO-254 (Z)



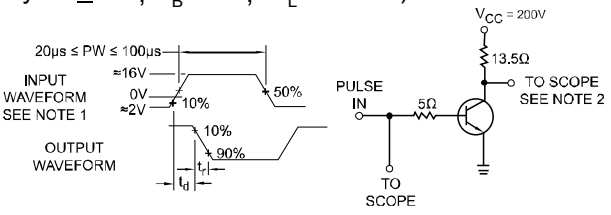
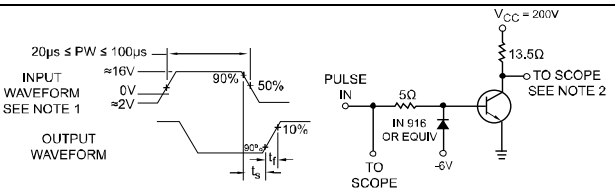
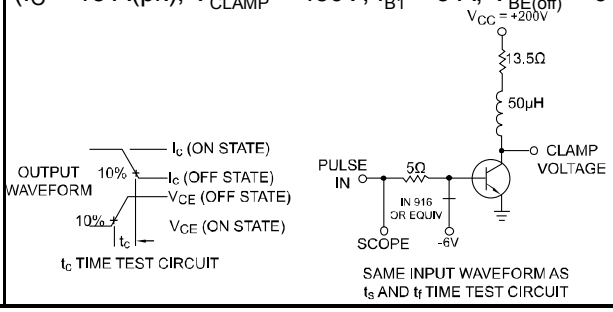
TO-3 (/3)



NOTES:
* Pulse Test: Pulse Width = 300 µs, Duty Cycle ≤ 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.

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

SFT6678 SERIES

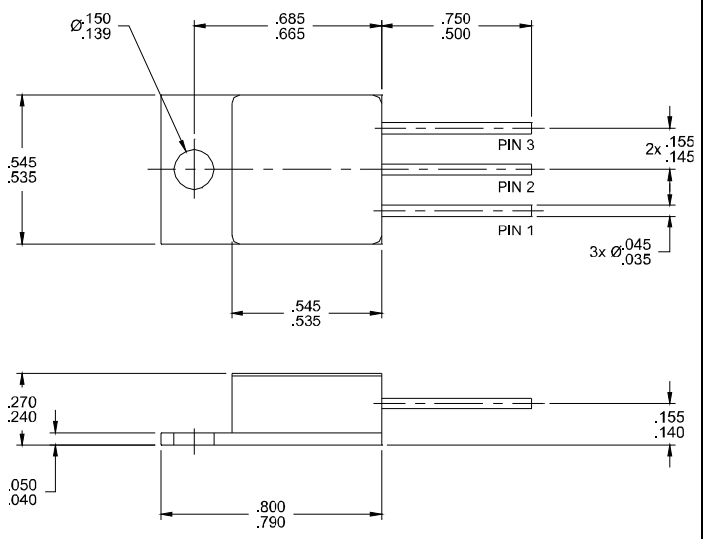
Electrical Characteristics		Symbol	Min	Max	Units
Collector Cutoff Current V_{CE}= 400V, V_{BE}(off) =1.5V V_{CE}= 650V, V_{BE}(off) =1.5V V_{CE}= 650V, V_{BE}(off) =1.5V	T_C = 25°C T_C = 25°C T_C = 125°C	I_{CEV}	- -	0.5 1.0 50	µA µA µA
Collector – Base Leakage Current	V_{CB} = 650V	I_{CBO}	-	1	mA
Emitter 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°C V_{CE} = 3V, 1_C = 1A, T_A = 25°C V_{CE} = 3V, 1_C = 15A,T_A = -55°C	H_{FE1} H_{FE2} H_{FE3}	8 15 4	20 40 -	
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°C) (T_C = 125°C)	V_{CE} (SAT)	- -	1.0 2.0	V
Current Gain (I_C = 1A, V_{CE} = 10V, f = 5MHz)		$\|h_{FE}\|$	3	10	
Output Capacitance (V_{CB} = 10V , f = 0.1MHz)		C_{ob}	150	500	pF
Delay Time	(V_{CC} = 200V, I_C = 15A, I_{B1} = I_{B2} = 3A, t_P = 50 µsec, Duty Cycle ≤ 2%, V_B = 6V, R_L = 13.5Ω)  t_d AND t_r TIME TEST CIRCUIT	$t_{(on)}$	t_d	-	0.1	µsec
Rise Time			t_r	-	2.5	
Storage Time	 t_s AND t_f TIME TEST CIRCUIT	$t_{(off)}$	t_s	-	0.6	
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		-	0.5	µsec

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

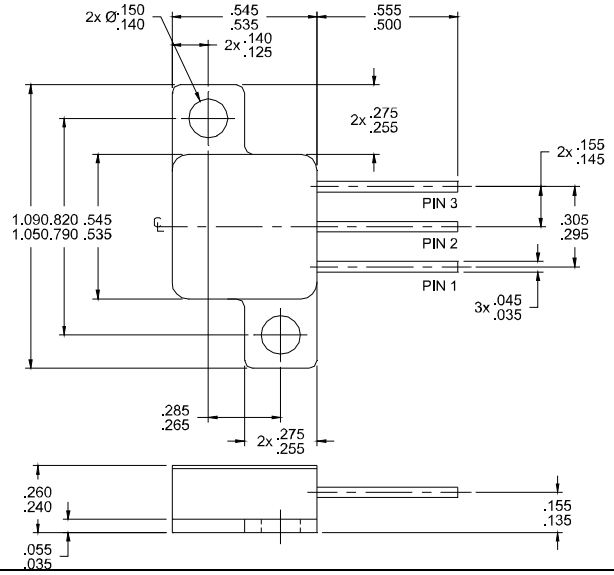
SFT6678 SERIES

Safe Operating Area, DC	V_{CE} = 11.7 V, I_C = 15 A, 1 sec V_{CE} = 30 V, I_C = 5.9 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 Ω, R_{BB2} = 1.5Ω, L = 50µH, V_{clamp} = 450V, I_C = 15 A

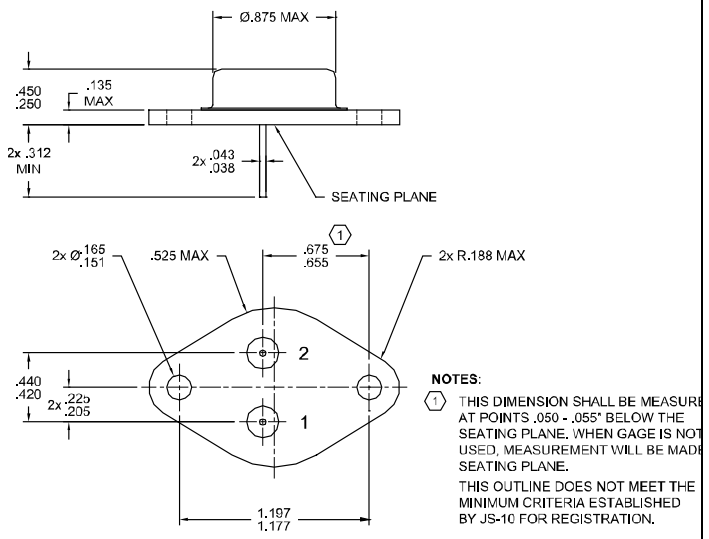
Case Outline: TO-254



Case Outline: TO-254Z



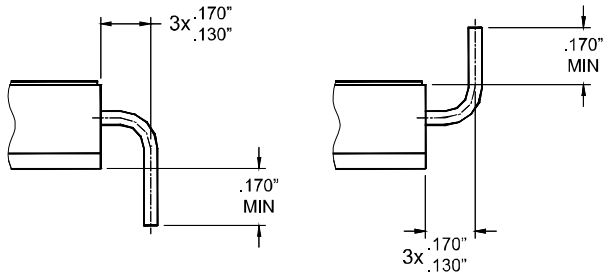
Case Outline: TO-3



NOTES:
1. THIS DIMENSION SHALL BE MEASURE AT POINTS .050 - .055" BELOW THE SEATING PLANE. WHEN GAGE IS NOT USED, MEASUREMENT WILL BE MADE SEATING PLANE.
THIS OUTLINE DOES NOT MEET THE MINIMUM CRITERIA ESTABLISHED BY JS-10 FOR REGISTRATION.

Lead Options

DB (Down Bend) **UB (Up Bend)**



PIN ASSIGNMENT (Standard)

Package	Collector	Emitter	Base
TO-3 (/3)	Case	Pin 2	Pin 3
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**