



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

SPT6693

**15 AMPS
400 Volts
High Voltage – High Energy
NPN Transistor**

DESIGNER'S DATA SHEET

Part Number / Ordering Information ^{1/}

SPT6693

Screening ^{2/}

___ = Not Screened

TX = TX Level

TXV = TXV Level

S = S Level

Features:

- Collector to Base Voltage 650 V Min
- High Power, 175 Watts
- High Gain, Low Saturation
- 200°C Operating Temperature
- Isolated Package with Low Theta
- Equivalent to MIL-PRF-19500/538
- TX, TXV, S-Level Screening Available. Consult Factory.

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	Volts
Collector Current	I_C	15	Amps
Base Current	I_B	7	Amps
Total Power Dissipation @ $T_c = 25^\circ C$ Derate above 25°C	P_D	175 1	Watts W/°C
Operating & Storage Temperature	$T_{OP} \& T_{STG}$	-65 to +200	°C
Maximum Thermal Resistance (Junction to Case)	$R_{\theta JC}$	1.0	°C/W

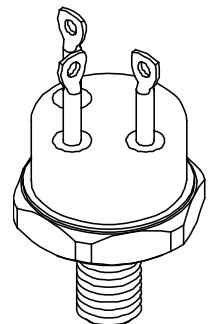
Notes:

* Pulse Test: Pulse Width = 300µsec, Duty Cycle = 2%

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

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

TO-61 (/61)



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

DATA SHEET #: TR0114A

DOC



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

SPT6693

Electrical Characteristics		Symbol	Min	Max	Units	
Collector – Emitter Blocking Voltage*	($I_C = 200 \text{ mA}$)	BV_{CEO}	400	—	Volts	
Collector – Emitter Cutoff Current	($V_{CEX} = 650 \text{ V}, V_{EB} = 1.5 \text{ V}$) ($V_{CEX} = 400 \text{ V}, V_{EB} = 1.5 \text{ V}$) ($V_{CEX} = 650 \text{ V}, V_{EB} = 1.5 \text{ V}, T_A = 125^\circ\text{C}$)	I_{CEX1} I_{CEX2} I_{CEX3}	—	1 0.5 50	μA	
Collector Cutoff Current	($V_{CE} = 650 \text{ V}$)	I_{CBO}	—	1	mA	
Emitter Cutoff Current	($V_{EB} = 8 \text{ V}$)	I_{EBO}	—	2	mA	
DC Current Gain*	($I_C = 1 \text{ A}, V_{CE} = 3 \text{ V}$) ($I_C = 15 \text{ A}, V_{CE} = 3 \text{ V}$) ($I_C = 15 \text{ A}, V_{CE} = 3 \text{ V}, T_A = -55^\circ\text{C}$)	h_{FE}	15 8 4	40 20 —		
Collector – Emitter Saturation Voltage*	($I_C = 15 \text{ A}, I_B = 3.0 \text{ A}$) ($I_C = 15 \text{ A}, I_B = 3.0 \text{ A}, T_A = 125^\circ\text{C}$)	$V_{CE(SAT)1}$ $V_{CE(SAT)2}$	—	1.0 2.0	Volts	
Base – Emitter Saturation Voltage*	($I_C = 15 \text{ A}, I_B = 3.0 \text{ A}$)	$V_{BE(SAT)}$	—	1.5	Volts	
Current Gain – Bandwidth Product	$V_{CE} = 10 \text{ V}, I_C = 1 \text{ A}, f = 5 \text{ MHz}$	f_T	15	50	MHz	
Output Capacitance	$V_{CB} = 10 \text{ V}, I_E = 0 \text{ A}, f = 1.0 \text{ MHz}$	C_{ob}	150	500	pF	
Delay Time	<p>$20\mu\text{s} \leq PW \leq 100\mu\text{s}$ INPUT WAVEFORM SEE NOTE 1 OUTPUT WAVEFORM t_d AND t_r TIME TEST CIRCUIT</p>	$t_{(on)}$	t_d	—	100	ns
Rise Time			t_r	—	600	ns
Storage Time	<p>$20\mu\text{s} \leq PW \leq 100\mu\text{s}$ INPUT WAVEFORM SEE NOTE 1 OUTPUT WAVEFORM t_s AND t_f TIME TEST CIRCUIT</p>	$t_{(off)}$	t_s	—	2.5	μs
Fall Time			t_f	—	0.5	μs
Cross Over Time	<p>t_c TIME TEST CIRCUIT</p>	t_c	—	0.5	μs	
Safe Operating Area, DC	SOA_1	$V_{CE} = 11.7 \text{ V}, I_C = 15 \text{ A}, 1 \text{ sec}$				
	SOA_2	$V_{CE} = 25 \text{ V}, I_C = 7 \text{ A}, 1 \text{ sec}$				
	SOA_3	$V_{CE} = 100 \text{ V}, I_C = 0.25 \text{ A}, 1 \text{ sec}$				
	SOA_4	$V_{CE} = 400 \text{ V}, I_C = 10 \text{ mA}, 1 \text{ sec}$				
Safe Operating Area, clamped switching	$V_{CC} = 15 \text{ V}, V_{BB2} = 5 \text{ V}, R_{BB1} = 5 \Omega, R_{BB2} = 1.5\Omega, L = 50\mu\text{H}, V_{clamp} = 450\text{V}, I_C = 15 \text{ A}$					

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

DATA SHEET #: TR0114A

DOC

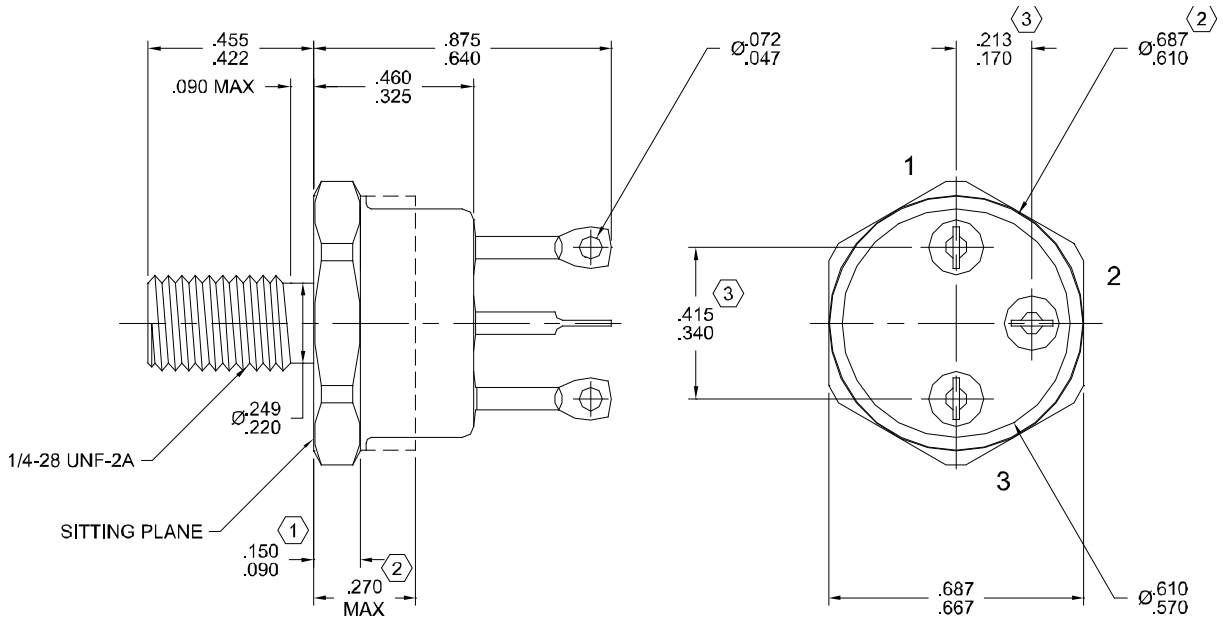


Solid State Devices, Inc.

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

SPT6693

Case Outline: TO-61



Available Part Numbers:
SPT6693

PIN ASSIGNMENT (Standard)			
Package	Collector	Emitter	Base
TO-61 (/61)	Pin 3	Pin 1	Pin 2

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

DATA SHEET #: TR0114A

DOC