Solid State Devices, Inc.
14701 Firestone Blvd * La Mirada, Ca 90638
Phone: (562) 404-4474 * Fax: (562) 404-1773
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SFT10000/3

20 AMP NPN DARLINGTON TRANSISTOR 350 VOLTS

DESIGNER'S DATA SHEET

Part Number / Ordering Information [1/]

SFT10000 __ __

Screening [2/]
- __ = Not Screened
- TX = TX Level
- TXV = TXV Level
- S = S Level

Package
- /3 = TO-3

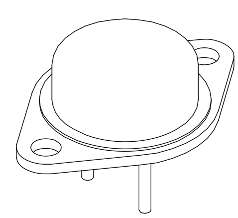
Features:
- BV_{CEO} 350 Volts
- Low Saturation Voltage
- 200°C Operating Temperature
- Hermetically Sealed, Isolated Package
- TX, TXV, S-Level Screening Available. Consult Factory.

Application Notes:
SFT10000 Darlington Transistor is a direct replacement of Motorola MJ1000. It is designed for high voltage, high speed, power switching in inductive circuits where fall time is critical. It is particularly suited for line operated switchmode applications such as:
- Switching Regulators
- Inverters
- Solenoid and Relay Drives
- Motor Controls
- Deflection Circuits

Maximum Ratings		Symbol	Value	Units
Collector – Emitter Voltage		V_{CEO}	350	**Volts**
Collector – Emitter Voltage		V_{CEV}	450	**Volts**
Emitter – Base Voltage		V_{EB}	8	**Volts**
Collector Current	Continuous Peak	I_C I_{CM}	20 30	**Amps**
Base Current		I_B	2.5	**Amps**
Total Power Dissipation **Derate above 50ºC**	@ T_C = 25ºC @ T_C = 100ºC	P_D	175 100 1	**Watts** **Watts** **W/ºC**
Operating & Storage Temperature		T_J & T_{STG}	-65 to +200	**ºC**
Maximum Thermal Resistance (Junction to Case)		$R_{\theta JC}$	1	**ºC/W**

NOTES:
1/ For ordering information, price, operating curves, and availability - contact factory.
2/ Screening based on MIL-PRF-19500. Screening flows available on request.

TO-3(/3)



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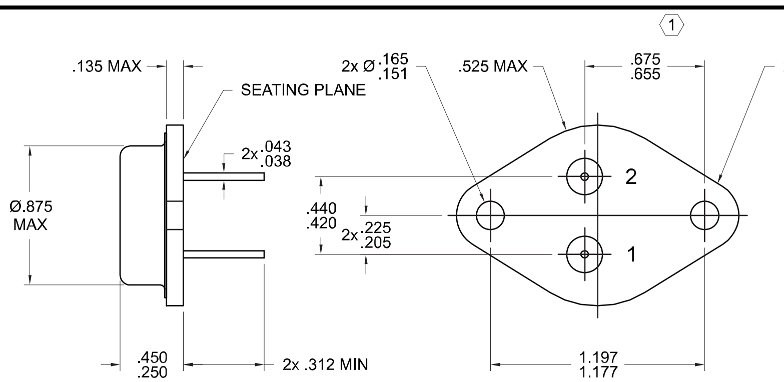
Electrical Characteristics	Conditions	Symbol	Min	Max	Units
Collector – Emitter Sustaining Voltage (I_C = 250 mA, I_B = 0, V_{CLAMP} = Rated V_{CEO})		$V_{CEO(sus)}$	80	—	Volts
Collector – Emitter Sustaining Voltage (V_{CLAMP} = Rated V_{CEX}, T_C = 100ºC)	I_C = 2A I_C = 10A	$V_{CEX(sus)}$	400 275	— —	Volts
Collector Cutoff Current (V_{CE} = Rated Value, $V_{BE(off)}$ = 1.5V)	T_C = 25ºC T_C = 100ºC	I_{CBO}	— —	0.25 5.0	mA
Collector Cutoff Current (V_{CEV} = Rated V_{CEV}, R_{BE} = 50Ω, T_C = 100ºC)		I_{CEV}	—	5	mA
Emitter Cutoff Current (V_{EB} = 8V, I_C = 0)		I_{EBO}	—	150	mA
DC Current Gain* (V_{CE} = 5V)	I_C = 5A I_C = 10A	H_{FE}	50 40	600 400	
Collector-Emitter Saturation Voltage*	I_C = 10A, I_B = 400mA, T_C = 25ºC I_C = 20A, I_B = 1A, T_C = 25ºC I_C = 10A, I_B = 400mA, T_C = 100ºC	$V_{CE\ (SAT)}$	— — —	1.9 3.0 2.0	Volts
Base-Emitter Saturation Voltage* (I_C = 10A, I_B = 400mA)	T_C = 25ºC T_C = 100ºC	$V_{BE\ (SAT)}$	— —	2.5 2.5	Volts
Diode Forward Voltage (I_F = 10A)		V_F	—	5.0	Volts
Small Signal Current Gain (I_C = 1A, V_{CE} = 10V, f = 1MHz)		H_{FE}	10	—	
Output Capacitance (V_{CB} = 30V, I_E = 0A, f = 2.0MHz)		C_{ob}	100	325	pF
Delay Time	V_{CC} = 250V, I_C = 10A, I_{B1} = I_{B2} = 400 mA, $V_{BE\ (off)}$ = 5V, tp = 50µs, Duty Cycle ≤ 2%	$t_{(on)}$: t_d	—	0.2	µs
Rise Time		$t_{(on)}$: t_r	—	0.6	µs
Storage Time		$t_{(off)}$: t_s	—	3.5	µs
Fall Time		$t_{(off)}$: t_f	—	2.4	µs
Storage Time	I_C = 10A(pk), V_{CLAMP} = Rated V_{CEX}, I_{B1} = 400 mA, $V_{BE\ (off)}$ = 5V, T_C = 100ºC	t_{sv}	—	5.5	µs
Crossover Time		t_c	—	3.7	µs

NOTES:

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

CASE OUTLINE: TO-3

Pin Out:
Case – Collector
1 – Base
2 – Emitter



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