



PRELIMINARY

SOLID STATE DEVICES, INC.

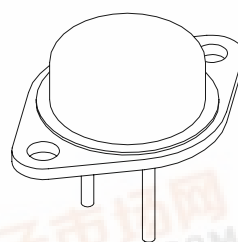
14830 Valley View Blvd * La Mirada, Ca 90638
Phone: (562) 404-7855 * Fax: (562) 404-1773

DESIGNER'S DATA SHEET

SFT10000/3

**20 AMP
350 VOLTS
NPN DARLINGTON
TRANSISTOR**

TO-3



APPLICATION NOTES:

SFT10000 Darlington Transistor is direct replacement of Motorola MJ 10000. 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:

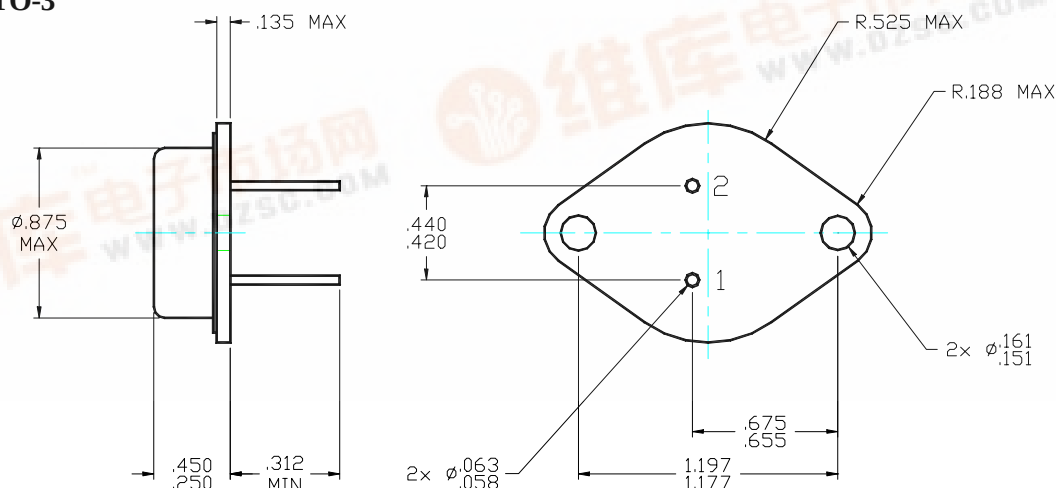
- Switching Regulators
- Inverters
- Solenoid and Relay Drives
- Motor Controls
- Deflection Circuits.

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	I_C I_{CM}	20 30	Amps
Base Current	I_B	2.5	Amps
Total Device Dissipation	P_D	175 100 1	W W W/°C
Derate above 25°C			
Operating and Storage Temperature	T_J, T_{STG}	-65 to +200	°C
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1	°C/W

CASE OUTLINE: TO-3

Pin Out:

- 1 - Collector
- 2 - Base
- 3 - Emmitter



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ELECTRICAL CHARACTERISTICS		SYMBOL	MIN	MAX	UNITS
Collector-Emitter Sustaining Voltage ($I_C = 250\text{mA}$, $I_B = 0$, $V_{CLAMP} = \text{Rated } V_{CEO}$)		$V_{CEO(sus)}$	350	-	V_{DC}
Collector-Emitter Sustaining Voltage ($V_{CLAMP} = \text{Rated } V_{CEX}$, $T_C = 100^\circ\text{C}$)		$V_{CEX(sus)}$	$I_C = 2\text{ A}$ 400 $I_C = 10\text{ A}$ 275	- - -	V_{DC}
Collector Cutoff Current ($V_{CE} = \text{Rated Value}$, $V_{BE(off)} = 1.5V_{DC}$)		I_{CBO}	$T_C = 25^\circ\text{C}$ - $T_C = 100^\circ\text{C}$ -	0.25 5.0	mA_{DC}
Collector Cutoff Current ($V_{CEV} = \text{Rated } V_{CEV}$, $R_{BE} = 50\Omega$, $T_C = 100^\circ\text{C}$)		I_{CEV}	-	5	mA_{DC}
Emitter Cutoff Current ($V_{EB} = 8V_{DC}$, $I_C = 0$)		I_{EBO}	-	150	mA_{DC}
DC Current Gain* ($V_{CE} = 5V_{DC}$)		H_{FE}	$I_C = 5A_{DC}$ 50 $I_C = 10A_{DC}$ 40	600 400	
Collector-Emitter Saturation Voltage* $I_C = 10A_{DC}$, $I_B = 400\text{mA}_{DC}$, $T_C = 25^\circ\text{C}$ $I_C = 20A_{DC}$, $I_B = 1A_{DC}$, $T_C = 25^\circ\text{C}$ $I_C = 10A_{DC}$, $I_B = 400\text{mA}_{DC}$, $T_C = 100^\circ\text{C}$		$V_{CE(SAT)}$	- - -	1.9 3.0 2.0	V_{DC}
Base-Emitter Saturation Voltage* ($I_C = 10A_{DC}$, $I_B = 400\text{mA}_{DC}$)		$V_{BE (SAT)}$	$T_C = 25^\circ\text{C}$ - $T_C = 100^\circ\text{C}$ -	2.5 2.5	V_{DC}
Diode Forward Voltage ($I_F = 10A_{DC}$)		V_F	-	5.0	V_{DC}
Small Signal Current Gain ($I_C = 1A_{DC}$, $V_{CE} = 10V_{DC}$, $f = 1\text{MHz}$)		H_{FE}	10	-	
Output Capacitance ($V_{CB} = 30V_{DC}$, $I_E = 0A_{DC}$, $f = 2.0\text{MHz}$)		C_{ob}	100	325	pf
Delay Time	$V_{CC} = 250V_{DC}$, $I_C = 10A_{DC}$, $I_{B1} = 400\text{mA}_{DC}$, $V_{BE(off)} = 5V_{DC}$ $t_p = 50\mu\text{sec}$, Duty Cycle $\leq 2\%$	t_d	-	0.2	μs
Rise Time		t_r	-	0.6	μs
Storage Time		t_s	-	3.5	μs
Fall Time		t_f	-	2.4	μs
Storage Time	$I_C = 10A(\text{pk})$, $V_{CLAMP} = \text{Rated } V_{CEX}$, $I_{B1} = 400\text{mA}$, $V_{BE(off)} = 5V_{DC}$, $T_C = 100^\circ\text{C}$	t_{sv}	-	5.5	μs
Crossover Time		t_c	-	3.7	μs

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