

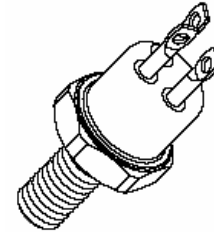


**Solid State Devices, Inc.**

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# SFT3852/59

## 5 AMP / 60 VOLTS NPN TRANSISTOR



TO-59

### DESIGNER'S DATA SHEET

**FEATURES:**

- Typical  $V_{CEO}$  TO 200 V
- Fast Switching
- Very Low Leakage
- Low Saturation Voltage
- 200°C Operating, Gold Eutectic Die Attach
- Replacement for 2N3852
- TX, TXV, and Space Level Screening Available. Contact Factory.

MAXIMUM RATINGS	Symbol	Value	Units
Collector – Emitter Voltage $R_{BE} = 1 \text{ k}\Omega$	$V_{CEO}$ $V_{CER}$	40 60	Volts
Collector – Base Voltage	$V_{CBO}$	60	Volts
Emitter – Base Voltage	$V_{EBO}$	5	Volts
Collector Current	$I_C$	5	Amps
Base Current	$I_B$	0.5	Amps
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	$P_D$	23 133	W mW/°C
Operating and Storage Temperature Range	$T_{OP} \ \& \ T_{STG}$	-65 to +200	°C
Thermal Resistance, Junction to Case	$R_{qJC}$	7.5	°C/W

**CASE OUTLINE:**

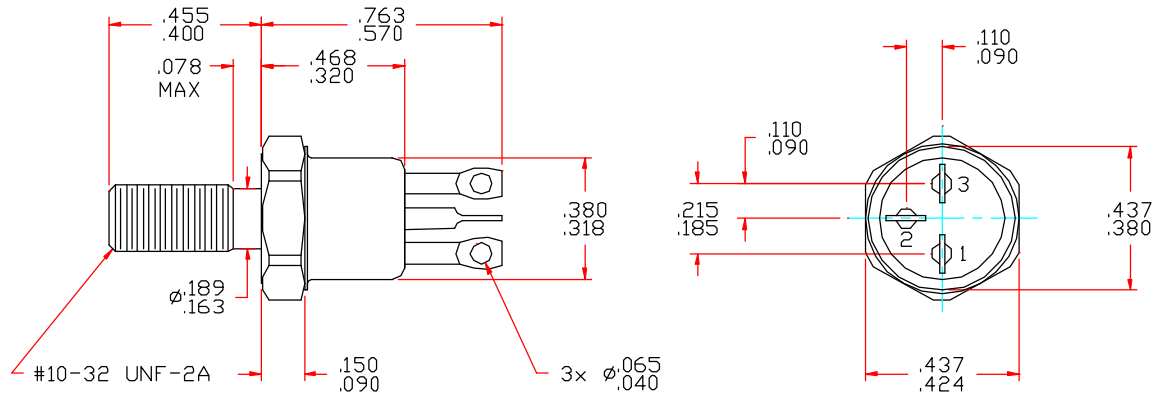
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Pin 1 – Emitter

Pin 2 – Base

Pin 3 – Collector

Case – isolated



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

**DATA SHEET #: TR0085A**

**DOC**



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ELECTRICAL CHARACTERISTICS, T <sub>A</sub> = 25°C, unless otherwise specified		Symbol	Min	Typ	Max	Units
Collector – Emitter Breakdown Voltage (I <sub>C</sub> = 100 mA)		BV <sub>CEO</sub>	40	175	—	V
Collector – Base Breakdown Voltage (I <sub>C</sub> = 100 μA <sub>DC</sub> )		BV <sub>CBO</sub>	60	200	—	V
Emitter – Base Breakdown Voltage (I <sub>E</sub> = 20 μA <sub>DC</sub> )		BV <sub>EBO</sub>	5	11	—	V
Emitter Cutoff Current (V <sub>EB</sub> = 5 V <sub>DC</sub> )		I <sub>EBO</sub>	—	0.005	10	uA
Collector Cutoff Current (V <sub>CE</sub> = 40 V <sub>DC</sub> )		I <sub>CES1</sub>	—	5	100	nA
Collector Cutoff Current (V <sub>CE</sub> = 40 V <sub>DC</sub> , T <sub>A</sub> = 150°C)		I <sub>CES2</sub>	—	—	50	uA
DC Current Gain* (V <sub>CE</sub> = 1 V <sub>DC</sub> )		H <sub>FE</sub>	50	80	200	
			30	75	—	
			15	50	—	
Collector – Emitter Saturation Voltage* (I <sub>C</sub> = 1 A <sub>DC</sub> , I <sub>B</sub> = 50 mA <sub>DC</sub> )		V <sub>CE (SAT)1</sub>	—	150	250	mV <sub>DC</sub>
Collector – Emitter Saturation Voltage* (I <sub>C</sub> = 2 A <sub>DC</sub> , I <sub>B</sub> = 200 mA <sub>DC</sub> )		V <sub>CE (SAT)2</sub>	—	160	500	mV <sub>DC</sub>
Collector – Emitter Saturation Voltage* (I <sub>C</sub> = 5 A <sub>DC</sub> , I <sub>B</sub> = 500 mA <sub>DC</sub> )		V <sub>CE (SAT)3</sub>	—	450	2000	mV <sub>DC</sub>
Base – Emitter Saturation Voltage* (I <sub>C</sub> = 1 A <sub>DC</sub> , I <sub>B</sub> = 50 mA <sub>DC</sub> )		V <sub>BE (SAT)1</sub>	—	0.78	1.2	V <sub>DC</sub>
Base – Emitter Saturation Voltage* (I <sub>C</sub> = 2 A <sub>DC</sub> , I <sub>B</sub> = 200 mA <sub>DC</sub> )		V <sub>BE (SAT)2</sub>	—	0.85	1.3	V <sub>DC</sub>
Current Gain Bandwidth Product (I <sub>C</sub> = 500 mA <sub>DC</sub> , V <sub>CE</sub> = 5 V <sub>DC</sub> , f = 20 MHz)		f <sub>T</sub>	20	38	—	MHz
Collector Capacitance (V <sub>CB</sub> = 10 V <sub>DC</sub> , I <sub>E</sub> = 0 A <sub>DC</sub> , f = 1.0 MHz)		C <sub>J</sub>	—	85	125	pF
Turn On Time	(V <sub>CC</sub> = 30 V <sub>DC</sub> , I <sub>C</sub> = 500 mA <sub>DC</sub> ,	t <sub>(d)</sub>	—	48	60	ns
		t <sub>(r)</sub>	—	115	150	
Turn Off Time	I <sub>B1</sub> = I <sub>B2</sub> = 50 mA <sub>DC</sub> , V <sub>gen</sub> = 15 V	t <sub>(s)</sub>	—	650	700	ns
		t <sub>(f)</sub>	—	65	200	

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

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