



**SOLID STATE DEVICES, INC.**

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**DESIGNER'S DATA SHEET**

**SFT5002/SFT5004  
 SERIES**

**10 AMP  
 150 VOLTS  
 NPN HIGH SPEED  
 POWER TRANSISTOR**

**Part Number /Ordering Information** <sup>1/</sup>  
**SFT5002 J UB TX**  
**SFT5004 J UB TX**

Screening <sup>2/</sup>: \_ = Not Screened  
 TX = TX Level  
 TXV = TXV Level  
 S = Space Level

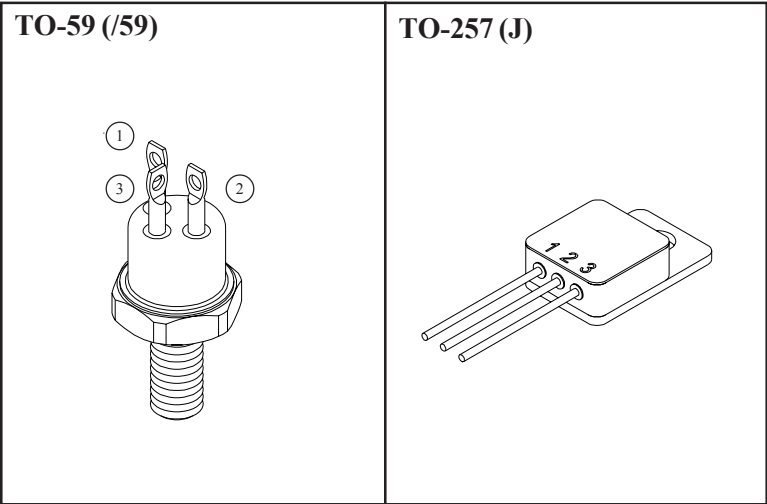
Lead Bend: <sup>3/</sup> \_ = Straight  
 UB = Up Bend  
 DB = Down Bend

Package: <sup>3/</sup> J = TO-257  
 /59 = TO-59

- FEATURES**
- **BV<sub>CEO</sub> 120V min.**
  - **Fast Switching**
  - **High Frequency**
  - **High Linear Gain, Low Saturation Voltage.**
  - **Radiation Tolerant**
  - **200°C Operating, Gold Eutectic Die Attach.**
  - **High Current, High Voltage Version of 2N5002 and 2N5004**

MAXIMUM RATINGS	SYMBOL	VALUE	UNITS
Collector-Base Voltage	V <sub>CBO</sub>	150	Volts
Collector-Emitter Voltage	V <sub>CEO</sub>	120	Volts
Emitter-Base Voltage	V <sub>EBO</sub>	6.0	Volts
Continuous Collector Current	I <sub>C</sub>	10	Amps
Base Current	I <sub>B</sub>	2	Amps
Operating and Storage Temperature	T <sub>J</sub> , T <sub>STG</sub>	-65 to +200	°C
Total Device Dissipation @ T <sub>C</sub> # 25°C Derate above 25°C	P <sub>D</sub>	50 0.33	W W/°C
Thermal Resistance, Junction to Case	R <sub>θJC</sub>	3.0	°C/W

**Available Part Numbers:**  
 SFT5002/59      SFT5004/59  
 SFT5002J      SFT5004J  
 SFT5002JUB      SFT5004JUB  
 SFT5002JDB      SFT5004JDB



PIN ASSIGNMENT				
CODE	FUNCTION	PIN 1	PIN 2	PIN 3
-	Normal	Collector	Emitter	Base

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

**DATA SHEET #: TR0020C**

# SFT5002/SFT5004 SERIES



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ELECTRICAL CHARACTERISTICS <sup>4/</sup>		SYMBOL	MIN	MAX	UNITS
<b>Collector-Emitter Breakdown Voltage</b> (I <sub>C</sub> = 100mA)		<b>BV<sub>CEO</sub></b>	<b>120</b>	-	<b>V<sub>DC</sub></b>
<b>Collector-Base Sustaining Voltage</b> (I <sub>C</sub> = 200μA)		<b>BV<sub>CBO</sub></b>	<b>150</b>	-	<b>V<sub>DC</sub></b>
<b>Emitter-Base Sustaining Voltage</b> (I <sub>E</sub> = 200μA)		<b>BV<sub>EBO</sub></b>	<b>6</b>	-	<b>V<sub>DC</sub></b>
<b>Collector Cutoff Current</b> (V <sub>CE</sub> = 60V <sub>DC</sub> , V <sub>BE</sub> = 2V <sub>DC</sub> , T <sub>C</sub> = 150°C) (V <sub>CE</sub> = 40V <sub>DC</sub> )		<b>I<sub>CEV</sub></b> <b>I<sub>CEO</sub></b>	- -	<b>500</b> <b>50</b>	<b>μA<sub>DC</sub></b> <b>μA<sub>DC</sub></b>
<b>Collector Cutoff Current</b> V <sub>CE</sub> = 60V <sub>DC</sub> V <sub>CE</sub> = 100V <sub>DC</sub>		<b>I<sub>CES</sub></b>	- -	<b>1.0</b> <b>1.0</b>	<b>μA<sub>DC</sub></b> <b>mA<sub>DC</sub></b>
<b>Emitter Cutoff Current</b> V <sub>EB</sub> = 5V <sub>DC</sub> V <sub>EB</sub> = 6V <sub>DC</sub>		<b>I<sub>EBO</sub></b>	- -	<b>1.0</b> <b>1.0</b>	<b>μA<sub>DC</sub></b> <b>mA<sub>DC</sub></b>
<b>DC Current Gain*</b> (SFT5002)  (SFT5004)		<b>H<sub>FE</sub></b>	<b>20</b>	<b>150</b>	
I <sub>C</sub> = 50mA <sub>DC</sub> , V <sub>CE</sub> = 5V <sub>DC</sub>			<b>30</b>		
I <sub>C</sub> = 2.5A <sub>DC</sub> , V <sub>CE</sub> = 5V <sub>DC</sub>			<b>20</b>		
I <sub>C</sub> = 5.0A <sub>DC</sub> , V <sub>CE</sub> = 5V <sub>DC</sub>			<b>15</b>	<b>200</b>	
I <sub>C</sub> = 10A <sub>DC</sub> , V <sub>CE</sub> = 5V <sub>DC</sub>			<b>50</b>		
I <sub>C</sub> = 50mA <sub>DC</sub> , V <sub>CE</sub> = 5V <sub>DC</sub>			<b>70</b>		
I <sub>C</sub> = 2.5A <sub>DC</sub> , V <sub>CE</sub> = 5V <sub>DC</sub>			<b>40</b>		
I <sub>C</sub> = 5.0A <sub>DC</sub> , V <sub>CE</sub> = 5V <sub>DC</sub>			<b>22</b>		
I <sub>C</sub> = 10A <sub>DC</sub> , V <sub>CE</sub> = 5V <sub>DC</sub>					
<b>Collector-Emitter Saturation Voltage *</b> I <sub>C</sub> = 2.5A <sub>DC</sub> , I <sub>B</sub> = 250mA <sub>DC</sub> I <sub>C</sub> = 5.0A <sub>DC</sub> , I <sub>B</sub> = 500mA <sub>DC</sub>		<b>V<sub>CE(SAT)</sub></b>	- -	<b>0.75</b> <b>1.5</b>	<b>V<sub>DC</sub></b>
<b>Base-Emitter Saturation Voltage *</b> I <sub>C</sub> = 2.5A <sub>DC</sub> , I <sub>B</sub> = 250mA <sub>DC</sub> I <sub>C</sub> = 5.0A <sub>DC</sub> , I <sub>B</sub> = 500mA <sub>DC</sub>		<b>V<sub>BE(SAT)</sub></b>	-	<b>1.45</b> <b>2.2</b>	<b>V<sub>DC</sub></b>
<b>Current Gain Bandwidth Product</b> (I <sub>C</sub> = 500mA <sub>DC</sub> , V <sub>CE</sub> = 5V <sub>DC</sub> , f = 10MHz)		<b>f<sub>T</sub></b>	<b>60</b> <b>70</b>	- -	<b>MHz</b>
<b>Output Capacitance</b> (V <sub>CB</sub> = 10V <sub>DC</sub> , I <sub>E</sub> = 0, f = 1MHz)		<b>C<sub>ob</sub></b>	-	<b>250</b>	<b>pF</b>
<b>On Time</b>	V <sub>CC</sub> = 30V <sub>DC</sub> , I <sub>B1</sub> = I <sub>B1</sub> = 500mA <sub>DC</sub> , I <sub>C</sub> = 5A <sub>DC</sub> , V <sub>BE(off)</sub> = 3.7V <sub>DC</sub> , R <sub>L</sub> = 6 Ω	<b>t<sub>on</sub></b>	-	<b>500</b>	<b>ns</b>
<b>Off Time</b>		<b>t<sub>off</sub></b>	-	<b>1.3</b>	<b>μs</b>

**NOTES:**

- 1/ For Ordering Information, Price, and Availability Contact Factory.
- 2/ Screening per MIL-PRF-19500.
- 3/ For Package Outlines Contact Factory.
- 4/ T<sub>C</sub> = 25°C, Unless Otherwise Specified.
- \* Pulse Test: Pulse Width = 300us, Duty Cycle = 2%

**Package Outline**

Part Number	Document
SFT5002/59 / SFT5004/59	60-0149-059
SFT5002J / SFT5004J	60-0149-504
SFT5002JDB / SFT5004JDB	60-0149-504
SFT5002JUB / SFT5004JUB	60-0149-504