



Solid State Devices, Inc.

14701 Firestone Blvd * La Mirada, Ca 90638
Phone: (562) 404-7855 * Fax: (562) 404-1773
ssdi@ssdi-power.com * www.ssdi-power.com

DESIGNER'S DATA SHEET

Part Number / Ordering Information ^{1/}

SFT3501

└ Screening ^{2/} = Not Screened
TX = TX Level
TXV = TXV Level
S = S Level

└ Package ^{3/} = TO-5
S.22 = SMD.22
-4 = LCC4
-4R = LCC4R Reverse Polarity

SFT3501

300 mA
Rad Tolerant, High Voltage
NPN Transistor
160 Volts

Features:

- Radiation Tolerant
- High Voltage: $V_{CEO} = 160$ Volts
- High Linear Gain
- Very Low Leakage and Saturation
- Fast Switching
- Meets MIL-PRF-19500/366 definition
- 200°C Operating Temperature
- Gold Eutectic Die Attach
- Replacement for 2N3501

Maximum Ratings	Symbol	Value	Unit
Collector – Emitter Voltage	V_{CEO}	160	V
Collector – Base Voltage	V_{CBO}	180	V
Emitter – Base Voltage	V_{EBO}	6	V
Continues Collector Current	I_C	300	mA
Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	5 28.6	W mW/°C
Operating & Storage Temperature	$T_{OP} \text{ \& } T_{STG}$	-55 to +200	°C
Maximum Thermal Resistance Junction to Case	$R_{\theta JC}$	35	°C/W

NOTES: *Pulsed per MIL-STD-750.

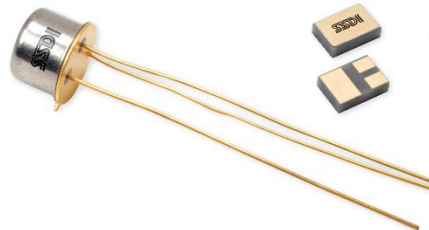
^{1/} For ordering information, price, and availability, contact factory.

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

^{3/} Unless otherwise specified, all electrical characteristics @ 25°C.

Available Part Numbers: SFT3501, SFT3501S.22, SFT3501-4, SFT3501-4R

TO-5 () SMD.22 (S.22) LCC4 (-4)



*Dime used for size reference

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

DATA SHEET #: TR0148B

DOCX



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SFT3501

Electrical Characteristic ^{3/}	Symbol	Min	Typ	Max	Unit
Collector – Emitter Breakdown Voltage $I_C = 10 \text{ mA}_{DC}, I_B = 0$	BV_{CEO}	160	—	—	V_{DC}
Collector – Base Breakdown Voltage $I_C = 10 \text{ } \mu\text{A}_{DC}, I_E = 0$	BV_{CBO}	180	—	—	V_{DC}
Emitter – Base Breakdown Voltage $I_E = 10 \text{ } \mu\text{A}_{DC}, I_C = 0$	BV_{EBO}	6	—	—	V_{DC}
Collector – Cutoff Current $V_{CB} = 75 V_{DC}, I_E = 0$ $V_{CB} = 150 V_{DC}, I_E = 0$ $V_{CB} = 75 V_{DC}, I_E = 0, T_A = 150^\circ\text{C}$	I_{CBO}	— — —	0.01 0.15 —	0.05 1 50	μA_{DC}
Collector Emitter cutoff Current	I_{CEO}	—	.1	1	μA_{DC}
Emitter – Cutoff Current $V_{EB(off)} = 4 \text{ V}, I_C = 0$ $V_{EB(off)} = 6 \text{ V}, I_C = 0$	I_{EBO}	—	2 0.005	25 10	nA_{DC} μA_{DC}
DC Current Gain* $V_{CE} = 10 V_{DC}, I_C = 0.1 \text{ mA}_{DC}$ $V_{CE} = 10 V_{DC}, I_C = 1 \text{ mA}_{DC}$ $V_{CE} = 10 V_{DC}, I_C = 10 \text{ mA}_{DC}^*$ $V_{CE} = 10 V_{DC}, I_C = 150 \text{ mA}_{DC}^*$ $V_{CE} = 10 V_{DC}, I_C = 150 \text{ mA}_{DC}, T_A = -55^\circ\text{C}$ $V_{CE} = 10 V_{DC}, I_C = 300 \text{ mA}_{DC}^*$	h_{FE}	100 120 150 140 45 20	200 200 200 190 100 40	— — — 300 — —	—
Collector – Emitter Saturation Voltage* $I_C = 10 \text{ mA}_{DC}, I_B = 1 \text{ mA}_{DC}$ $I_C = 150 \text{ mA}_{DC}, I_B = 15 \text{ mA}_{DC}$	$V_{CE(Sat)}$	— —	0.1 0.2	0.2 0.4	V_{DC}
Base – Emitter Saturation Voltage* $I_C = 10 \text{ mA}_{DC}, I_B = 1 \text{ mA}_{DC}$ $I_C = 150 \text{ mA}_{DC}, I_B = 15 \text{ mA}_{DC}$	$V_{BE(Sat)}$	— —	0.7 0.85	0.8 1.2	V_{DC}
Magnitude of Common Emitter Small-Signal Short-Circuit Forward Current Transfer Ratio $V_{CE} = 20 V_{DC}, I_C = 20 \text{ mA}_{DC}, f = 100 \text{ MHz}$	$ h_{FE} $	1.5	2.2	8	—
Output Capacitance $V_{CB} = 10 V_{DC}, I_E = 0, 100 \text{ kHz} \leq f \leq 1 \text{ MHz}$	C_{OBO}	—	5.5	8	pF
Input Capacitance $V_{EB} = 0.5 V_{DC}, I_C = 0, 100 \text{ kHz} \leq f \leq 100 \text{ MHz}$	C_{IBO}	—	50	80	pF
Small-Signal Current Gain $V_{CE} = 10 V_{DC}, I_C = 10 \text{ mA}_{DC}, f = 1 \text{ kHz}$	h_{FE}	75	220	300	—
Noise Figure $V_{CE} = 10 V_{DC}, I_C = 0.5 \text{ mA}_{DC}, R_G = 1 \text{ k}\Omega, f = 1 \text{ MHz}$	NF	—	—	16	dB
Noise Figure $V_{CE} = 10 V_{DC}, I_C = 0.5 \text{ mA}_{DC}, R_G = 1 \text{ k}\Omega, f = 1 \text{ MHz}$	NF	—	—	6	dB
Turn-On Time $V_{EB} = 12 V_{DC}, I_C = 150 \text{ mA}_{DC}, I_{B1} = 15 \text{ mA}_{DC}$	t_{on}	—	90	115	ns
Turn-Off Time $I_C = 150 \text{ mA}_{DC}, I_{B1} = I_{B2} = -15 \text{ mA}_{DC}$	t_{off}	—	900	1150	ns

NOTES: *Pulsed per MIL-STD-750.

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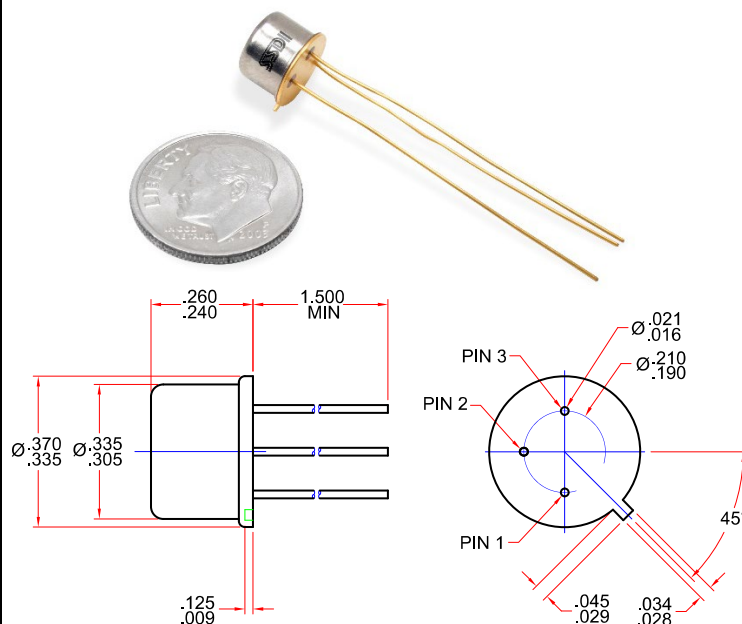


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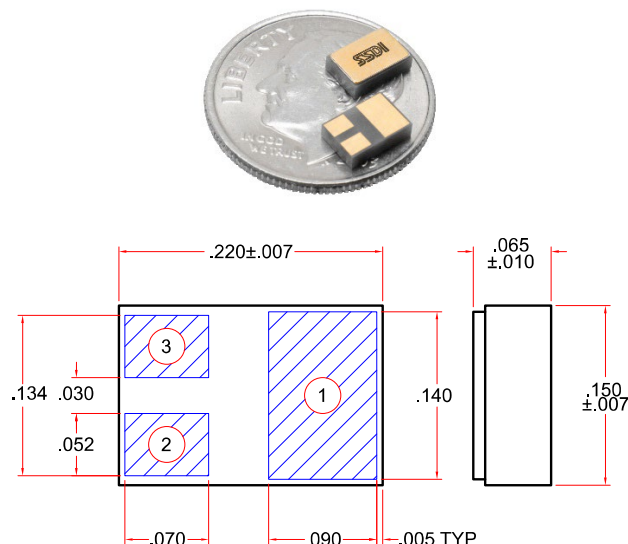
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SFT3501

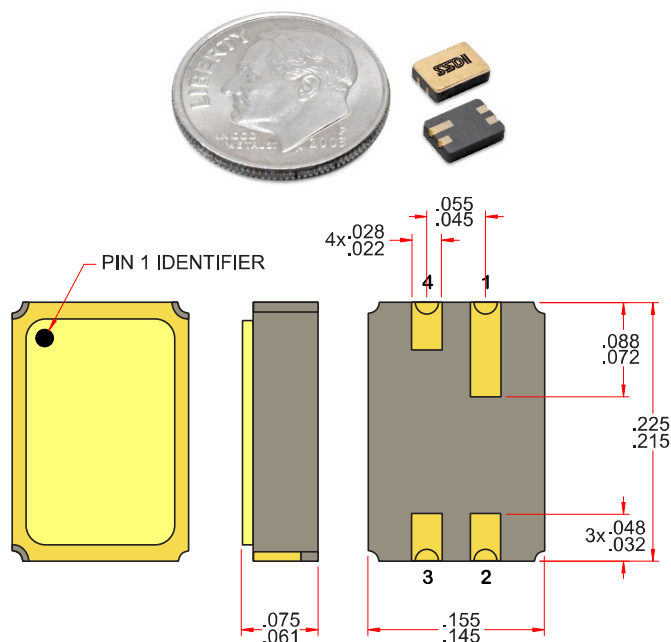
TO-5 ()



SMD.22 (S.22)



LCC4 (-4)



PIN ASSIGNMENT

Package	Pin 1	Pin 2	Pin 3 (Case)	Pin 4
TO-5	Emitter	Base	Collector	N/A
SMD.22	Collector	Emitter	Base	N/A
LCC.4	Collector	Emitter	Base	N/C
LCC.4R	Collector	Base	Emitter	N/C

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