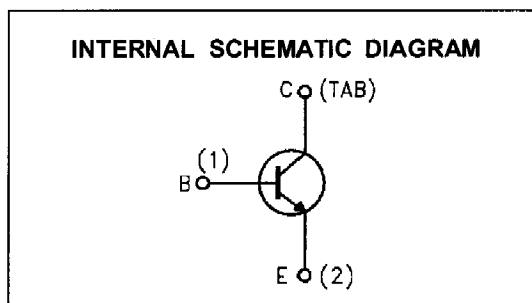
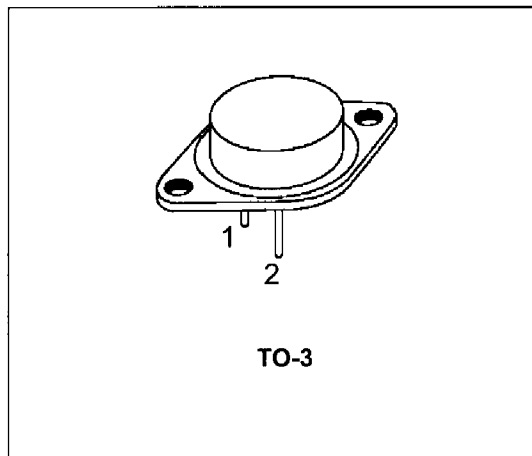


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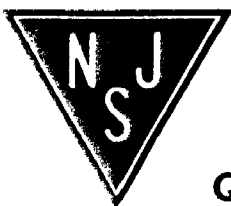
SILICON NPN SWITCHING TRANSISTOR

- FAST SWITCHING TIMES
- LOW SWITCHING LOSSES
- VERY LOW SATURATION VOLTAGE AND HIGH GAIN FOR REDUCED LOAD OPERATION



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CEV}	Collector-emitter Voltage ($V_{BE} = -1.5V$)	350	V
V_{CEO}	Collector-emitter Voltage ($I_B = 0$)	250	V
V_{EBO}	Emitter-Base Voltage ($I_C = 0$)	7	V
I_C	Collector Current	12	A
I_{CM}	Collector Peak Current	18	A
I_B	Base Current	2.5	A
I_{BM}	Base Peak Current	4	A
P_{Base}	Reverse Bias Base Dissipation (B.E. junction in avalanche)	1	A
P_{tot}	Total Dissipation at $T_{case} \leq 25^\circ C$	120	W
T_{stg}	Storage Temperature	-65 to 200	$^\circ C$
T_j	Max Operating Junction Temperature	200	$^\circ C$



NJ Semi-Conductors reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by NJ Semi-Conductors is believed to be both accurate and reliable at the time of going to press. However, NJ Semi-Conductors assumes no responsibility for any errors or omissions discovered in its use. NJ Semi-Conductors encourages customers to verify that datasheets are current before placing orders.

Quality Semi-Conductors

THERMAL DATA

$R_{thj-case}$	Thermal Resistance Junction-case	Max	1.46	°C/W
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ELECTRICAL CHARACTERISTICS ($T_{case} = 25^{\circ}C$ unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CER}	Collector Cut-off Current ($R_{BE} = 10\Omega$)	$V_{CE} = V_{CEV}$ $V_{CE} = V_{CEV} \quad T_C = 100^{\circ}C$			0.5 2.5	mA mA
I_{CEV}	Collector Cut-off Current	$V_{CE} = V_{CEV} \quad V_{BE} = -1.5V$ $V_{CE} = V_{CEV} \quad V_{BE} = -1.5V \quad T_C = 100^{\circ}C$			0.5 2	mA mA
I_{EBO}	Emitter Cut-off Current ($I_C = 0$)	$V_{EB} = 5V$			1	mA
$V_{CEO(sus)*}$	Collector-Emitter Sustaining Voltage	$I_C = 0.2A$ $L = 25mH$	250			V
V_{EBO}	Emitter-base Voltage ($I_C = 0$)	$I_E = 50mA$	7			V
$V_{CE(sat)*}$	Collector-Emitter Saturation Voltage	$I_C = 2A \quad I_B = 0.13A$ $I_C = 4A \quad I_B = 0.4A$ $I_C = 6A \quad I_B = 0.75A$ $I_C = 2A \quad I_B = 0.13A \quad T_j = 100^{\circ}C$ $I_C = 4A \quad I_B = 0.4A \quad T_j = 100^{\circ}C$ $I_C = 6A \quad I_B = 0.75A \quad T_j = 100^{\circ}C$		0.25 0.4 0.5 0.25 0.45 0.6	0.8 0.9 1.2 0.9 1.2 1.5	V V V V V V
$V_{BE(sat)*}$	Base-Emitter Saturation Voltage	$I_C = 4A \quad I_B = 0.4A$ $I_C = 6A \quad I_B = 0.75A$ $I_C = 4A \quad I_B = 0.4A \quad T_j = 100^{\circ}C$ $I_C = 6A \quad I_B = 0.75A \quad T_j = 100^{\circ}C$		1 1.1 0.9 1.1	1.3 1.5 1.3 1.5	V V V V
di_c/d_t*	Rated of Rise of on-state Collector Current	$V_{CC} = 200V \quad R_C = 0 \quad I_{B1} = 0.6A$ $T_j = 25^{\circ}C$ $T_j = 100^{\circ}C$	25 20	40 35		A/ μs A/ μs
$V_{CE(2\mu s)}$	Collector Emitter Dynamic Voltage	$V_{CC} = 200V$ $R_C = 50\Omega \quad I_{B1} = 0.4A$ $T_j = 25^{\circ}C$ $T_j = 100^{\circ}C$		1.7 2.5	2.5 4	V V
$V_{CE(4\mu s)}$	Collector Emitter Dynamic Voltage	$V_{CC} = 200V$ $R_C = 50\Omega \quad I_{B1} = 0.4A$ $T_j = 25^{\circ}C$ $T_j = 100^{\circ}C$		0.9 1.1	1.7 2	V V

* Pulsed: Pulse duration = 300 μs , duty cycle = 2 %

ELECTRICAL CHARACTERISTICS (continued)

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
t_r	RESISTIVE LOAD Rise Time	$V_{CC} = 200V$	$I_C = 6A$		0.3	0.4	μs
t_s		$V_{BB} = -5V$	$I_{B1} = 0.75A$		1	1.6	μs
t_f		$R_{B2} = 3.3\Omega$	$T_p = 30\mu s$		0.15	0.3	μs
	INDUCTIVE LOAD						
t_s	Storage Time	$V_{CC} = 200V$	$V_{clamp} = 250V$		1.2	1.8	μs
t_f	Fall Time	$I_{CC} = 4A$	$I_B = 0.4A$		0.08	0.2	μs
t_t	Tail Time in Turn-on	$V_{BB} = -5V$	$R_{B2} = 6.3\Omega$		0.03	0.12	μs
t_c	Crossover Time	$L_C = 2.5mH$			0.15	0.35	μs
t_s	Storage Time	$V_{CC} = 200V$	$V_{clamp} = 250V$		1.8	2.4	μs
t_f	Fall Time	$I_{CC} = 4A$	$I_B = 0.4A$		0.2	0.4	μs
t_t	Tail Time in Turn-on	$V_{BB} = -5V$	$R_{B2} = 6.3\Omega$		0.08	0.2	μs
t_c	Crossover Time	$L_C = 2.5mH$	$T_j = 100^\circ C$		0.4	0.7	μs
t_s	Storage Time	$V_{CC} = 200V$	$V_{clamp} = 250V$		2.5		μs
t_f	Fall Time	$I_{CC} = 4A$	$I_B = 0.5A$		0.4		μs
t_t	Tail Time in Turn-on	$V_{BB} = 0$	$R_{B2} = 7.5\Omega$		0.15		μs
		$L_C = 2.5mH$					
t_s	Storage Time	$V_{CC} = 200V$	$V_{clamp} = 250V$		4.8		μs
t_f	Fall Time	$I_{CC} = 4A$	$I_B = 0.4A$		0.7		μs
t_t	Tail Time in Turn-on	$V_{BB} = 0$	$R_{B2} = 7.5\Omega$		0.4		μs
		$L_C = 2.5mH$	$T_j = 100^\circ C$				

* Pulsed: Pulse duration = 300 μs , duty cycle = 2 %

TO-3 (H) MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A		11.7			0.460	
B	0.96		1.10	0.037		0.043
C			1.70			0.066
D			8.7			0.342
E			20.0			0.787
G		10.9			0.429	
N		16.9			0.665	
P			26.2			1.031
R	3.88		4.09	0.152		0.161
U			39.50			1.555
V		30.10			1.185	

