NPN SILICON SWITCHING TRANSISTOR
Qualified per MIL-PRF-19500/317

Devices		*Qualified Level*
2N2369A	**2N4449**	**JAN**
2N2369AU	**2N4449U**	**JANTX**
2N2369AUA	**2N4449UA**	**JANTXV**
2N2369AUB	**2N4449UB**	

MAXIMUM RATINGS

Ratings	Symbol	All UB	All others	Unit
Collector-Emitter Voltage	V_{CEO}	20	15	Vdc
Emitter-Base Voltage	V_{EBO}	6.0	4.5	Vdc
Collector-Base Voltage	V_{CBO}	40		Vdc
Collector-Emitter Voltage	V_{CES}	40		Vdc
		@ T_A = +25^{0}C	@ T_C = +25^{0}C	
Total Power Dissipation 2N2369A; 2N4449	P_T	0.50[1]	1.2[2]	W
All UA		0.50[5]	1.2[2]	W
All UB		0.40[6]	1.4[7]	
All U		0.60[3]	1.5[4]	
Operating & Storage Junction Temperature Range	T_{op}, T_{stg}	-65 to +200		^{0}C

THERMAL CHARACTERISTICS

Characteristics	Symbol	Max.	Unit
Thermal Resistance, Junction-to-Case			
2N2369A; 2N4449	$R_{\theta JC}$	146	^{0}C/mW
All UA		125	
All UB		135	
All U		117	
Thermal Resistance, Ambient-to-Case			
2N2369A; 2N4449	$R_{\theta JA}$	325	^{0}C/mW
All UA		350	
All UB		437	
All U		291	

1) Derate linearly 3.08 mW/^{0}C above T_A = +37.5^{0}C
2) Derate linearly 6.85 mW/^{0}C above T_C = +25^{0}C
3) Derate linearly 3.44 mW/^{0}C above T_A = +63.5^{0}C
4) Derate linearly 8.55 mW/^{0}C above T_C = +63.5^{0}C
5) Derate linearly 2.86 mW/^{0}C above T_C = +63.5^{0}C
6) Derate linearly 2.29 mW/^{0}C above T_C = +63.5^{0}C
7) Derate linearly 8.00 mW/^{0}C above T_C = +63.5^{0}C

TO-18* (TO-206AA)
2N2369A

TO-46 (TO-206AB)
2N4449

SURFACE MOUNT
UA*

SURFACE MOUNT
UB*

SURFACE MOUNT
U*

*See appendix A for package outline

ELECTRICAL CHARACTERISTICS ($T_A = 25^0C$ unless otherwise noted)

Characteristics	Symbol	Min.	Max.	Unit
OFF CHARACTERISTICS				
Collector-Emitter Breakdown Voltage $I_C = 10$ mAdc	$V_{(BR)CEO}$	15		Vdc
Collector-Emitter Cutoff Current $V_{CE} = 20$ Vdc	I_{CES}		0.4	µAdc
Emitter-Base Breakdown Voltage $V_{EB} = 4.5$ Vdc Emitter-Base Cutoff Current $V_{EB} = 4.0$ Vdc	I_{EBO}		10 0.25	µAdc
Collector-Base Breakdown Voltage $V_{CB} = 40$ Vdc Collector-Base Cutoff Current $V_{CB} = 32$ Vdc	I_{CBO}		10 0.2	µAdc
ON CHARACTERISTICS (1)				
Forward-Current Transfer Ratio $I_C = 10$ mAdc, $V_{CE} = 0.35$ Vdc $I_C = 30$ mAdc, $V_{CE} = 0.4$ Vdc $I_C = 10$ mAdc, $V_{CE} = 1.0$ Vdc $I_C = 100$ mAdc, $V_{CE} = 1.0$ Vdc	h_{FE}	40 30 40 20	120 120 120 120	
Collector-Emitter Saturation Voltage $I_C = 10$ mAdc, $I_B = 1.0$ mAdc $I_C = 30$ mAdc, $I_B = 3.0$ mAdc $I_C = 100$ mAdc, $I_B = 10$ mAdc	$V_{CE(sat)}$		0.20 0.25 0.45	Vdc
Base-Emitter Saturation Voltage $I_C = 10$ mAdc, $I_B = 1.0$ mAdc $I_C = 30$ mAdc, $I_B = 3.0$ mAdc $I_C = 100$ mAdc, $I_B = 10$ mAdc	$V_{BE(sat)}$	0.70 0.80	0.85 0.90 1.20	Vdc
DYNAMIC CHARACTERISTICS				
Forward Current Transfer Ratio $I_C = 10$ mAdc, $V_{CE} = 10$ Vdc, $f = 100$ MHz	$\lvert h_{fe} \rvert$	5.0	10	
Output Capacitance $V_{CB} = 5.0$ Vdc, $I_E = 0$, 100 kHz $\leq f \leq 1.0$ MHz	C_{obo}		4.0	pF
Input Capacitance $V_{EB} = 0.5$ Vdc, $I_C = 0$, 100 kHz $\leq f \leq 1.0$ MHz	C_{ibo}		5.0	pF

(1)Pulse Test: Pulse Width = 300µs, Duty Cycle $\leq 2.0\%$.

SWITCHING CHARACTERISTICS

Characteristics	Symbol	Min.	Max.	Unit
Turn-On Time $I_C = 10$ mAdc; $I_{B1} = 3.0$ mAdc, $I_{B2} = 1.5$ mAdc	t_{on}		12	ηs
Turn-Off Time $I_C = 10$ mAdc; $I_{B1} = 3.0$ mAdc, $I_{B2} = 1.5$ mAdc	t_{off}		18	ηs
Charge Storage Time $I_C = 10$ mAdc; $I_{B1} = 10$ mAdc, $I_{B2} = 10$ mAdc	t_s		13	ηs

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