



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of "Quality Parts,Customers Priority,Honest Operation,and Considerate Service",our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



NPN SILICON TRANSISTOR

Qualified per MIL-PRF-19500/317

DEVICES

2N2369A 2N2369AUB 2N4449
 2N2369AU 2N2369AUBC *
 2N2369AUA

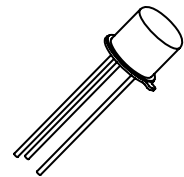
LEVELS

JAN
 JANTX
 JANTXV
 JANS

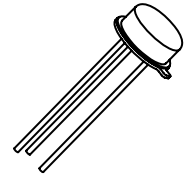
* Available to JANS quality level only.

ABSOLUTE MAXIMUM RATINGS ($T_C = +25^\circ\text{C}$ unless otherwise noted)

Parameters / Test Conditions	Symbol	Value	Unit
Collector-Emitter Voltage 2N2369A / U / UA 2N4449 / UB / UBC	V_{CEO}	15 20	Vdc
Emitter-Base Voltage 2N2369A / U / UA 2N4449 / UB / UBC	V_{EBO}	4.5 6.0	Vdc
Collector-Base Voltage	V_{CBO}	40	Vdc
Collector-Emitter Voltage	I_{CES}	40	Vdc
Total Power Dissipation @ $T_A = +25^\circ\text{C}$	P_T	0.36 ⁽¹⁾ 0.36 ^(1,5) 0.50 ⁽⁴⁾	W
Operating & Storage Junction Temperature Range	T_{op}, T_{stg}	-65 to +200	$^\circ\text{C}$



TO-18 (TO-206AA)
2N2369A



TO-46 (TO-206AB)
2N4449

THERMAL CHARACTERISTICS

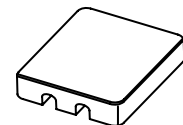
Parameters / Test Conditions	Symbol	Value	Unit
Thermal Resistance, Ambient-to-Case 2N2369A; 2N4449 UA, UB, UBC U	$R_{\theta JA}$	400 400 ⁽⁵⁾ 350	$^\circ\text{C}/\text{W}$

Note:

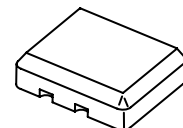
- Derate linearly 2.06 mW/ $^\circ\text{C}$ above $T_A = +25^\circ\text{C}$.
- Derate linearly 4.76 mW/ $^\circ\text{C}$ above $T_C = +95^\circ\text{C}$.
- Derate linearly 3.08 mW/ $^\circ\text{C}$ above $T_C = +70^\circ\text{C}$.
- Derate linearly 3.44 mW/ $^\circ\text{C}$ above $T_A = +54.5^\circ\text{C}$.
- Mounted on FR-4 PCB (10z. Cu) with contacts 20 mils larger than package pads.

ELECTRICAL CHARACTERISTICS ($T_A = +25^\circ\text{C}$, unless otherwise noted)

Parameters / Test Conditions	Symbol	Min.	Max.	Unit
OFF CHARACTERISTICS				
Collector-Emitter Breakdown Voltage $I_C = 10\text{mA}$	$V_{(BR)CEO}$	15		Vdc
Collector-Base Cutoff Current $V_{CE} = 20\text{Vdc}$	I_{CES}		0.4	μA



SURFACE MOUNT
UA



SURFACE MOUNT
UB & UBC
(UBC = Ceramic Lid Version)



SURFACE MOUNT
U (Dual Transistor)

NPN SILICON TRANSISTOR

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ELECTRICAL CHARACTERISTICS ($T_A = +25^\circ\text{C}$, unless otherwise noted)

Parameters / Test Conditions	Symbol	Min.	Max.	Unit
OFF CHARACTERISTICS				
Emitter-Base Breakdown Voltage $V_{EB} = 4.5\text{Vdc}$ Emitter-Base Cutoff Current $V_{EB} = 4.0\text{Vdc}$	I_{EBO}		10 0.25	μAdc
Collector- Base Breakdown Voltage $V_{CB} = 40\text{Vdc}$ Collector-Base Cutoff Current $V_{CB} = 32\text{Vdc}$	I_{CBO}		10 0.2	μAdc
ON CHARACTERISTICS ⁽¹⁾				
Forward-Current Transfer Ratio $I_C = 10\text{mAdc}$, $V_{CE} = 0.35\text{Vdc}$ $I_C = 30\text{mAdc}$, $V_{CE} = 0.4\text{Vdc}$ $I_C = 10\text{mAdc}$, $V_{CE} = 1.0\text{Vdc}$ $I_C = 100\text{mAdc}$, $V_{CE} = 1.0\text{Vdc}$	h_{FE}	40 30 40 20	120 120 120 120	
Collector-Emitter Saturation Voltage $I_C = 10\text{mAdc}$, $I_B = 1.0\text{mAdc}$ $I_C = 30\text{mAdc}$, $I_B = 3.0\text{mAdc}$ $I_C = 100\text{mAdc}$, $I_B = 10\text{mAdc}$	$V_{CE(sat)}$		0.20 0.25 0.45	Vdc
Base-Emitter Saturation Voltage $I_C = 10\text{mAdc}$, $I_B = 1.0\text{mAdc}$ $I_C = 30\text{mAdc}$, $I_B = 3.0\text{mAdc}$ $I_C = 100\text{mAdc}$, $I_B = 10\text{mAdc}$	$V_{BE(sat)}$	0.70 0.80	0.85 0.90 1.20	Vdc

DYNAMIC CHARACTERISTICS

Parameters / Test Conditions	Symbol	Min.	Max.	Unit
Forward Current Transfer Ratio $I_C = 10\text{mAdc}$, $V_{CE} = 10\text{Vdc}$, $f = 100\text{MHz}$	$ h_{fe} $	5.0	10	
Output Capacitance $V_{CB} = 5.0\text{Vdc}$, $I_E = 0$, $100\text{kHz} \leq f \leq 1.0\text{MHz}$	C_{obo}		4.0	pF
Input Capacitance $V_{EB} = 0.5\text{Vdc}$, $I_C = 0$, $100\text{kHz} \leq f \leq 1.0\text{MHz}$	C_{ibo}		5.0	pF

SWITCHING CHARACTERISTICS

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

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