6 Lake Street, Lawrence, MA 01841
1-800-446-1158 / (978) 620-2600 / Fax: (978) 689-0803
Website: http: //www.microsemi.com

TECHNICAL DATA SHEET

NPN SILICON SWITCHING TRANSISTOR

Qualified per MIL-PRF-19500/255

DEVICES

2N2221A	**2N2222A**
2N2221AL	**2N2222AL**
2N2221AUA	**2N2222AUA**
2N2221AUB	**2N2222AUB**
2N2221AUBC *	**2N2222AUBC ***

LEVELS

JAN
JANTX
JANTXV
JANS
JANHC

*** Available to JANS quality level only.**

ABSOLUTE MAXIMUM RATINGS ***(T_C = +25°C unless otherwise noted)***

Parameters / Test Conditions	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	50	Vdc
Collector-Base Voltage	V_{CBO}	75	Vdc
Emitter-Base Voltage	V_{EBO}	6.0	Vdc
Collector Current	I_C	800	mAdc
Total Power Dissipation @ T_A = +25°C	P_T	0.5	W
Operating & Storage Junction Temperature Range	T_{op}, T_{stg}	-65 to +200	°C

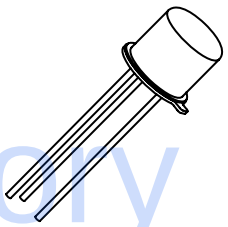
THERMAL CHARACTERISTICS

Parameters / Test Conditions	Symbol	Max.	Unit
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	325	°C/W

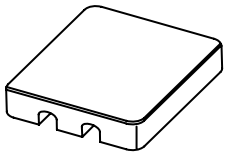
Note: Consult 19500/255 for thermal performance curves.

ELECTRICAL CHARACTERISTICS ***(T_A = +25°C, unless otherwise noted)***

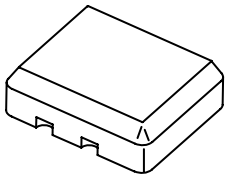
Parameters / Test Conditions	Symbol	Min.	Max.	Unit
OFF CHARACTERTICS				
Collector-Emitter Breakdown Voltage I_C = 10mAdc	$V_{(BR)CEO}$	50		Vdc
Collector-Base Cutoff Current V_{CB} = 75Vdc V_{CB} = 60Vdc	I_{CBO}		10 10	µAdc ηAdc
Emitter-Base Cutoff Current V_{EB} = 6.0Vdc V_{EB} = 4.0Vdc	I_{EBO}		10 10	µAdc ηAdc
Collector-Emitter Cutoff Current V_{CE} = 50Vdc	I_{CES}		50	ηAdc



TO-18 (TO-206AA)
2N2221A, 2N2222A



4 PIN
2N2221AUA, 2N2222AUA



3 PIN
2N2221AUB, 2N2222AUB
2N2221AUBC, 2N2222AUBC
(UBC = Ceramic Lid Version)

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ELECTRICAL CHARACTERISTICS *(T_A = +25°C, unless otherwise noted)*

Parameters / Test Conditions		Symbol	Min.	Max.	Unit
ON CHARACTERISTICS (2)					
Forward-Current Transfer Ratio					
I_C = 0.1mAdc, V_{CE} = 10Vdc	2N2221A, L, UA, UB, UBC	h_{FE}	30		
	2N2222A, L, UA, UB, UBC		50		
I_C = 1.0mAdc, V_{CE} = 10Vdc	2N2221A, L, UA, UB, UBC		35	150	
	2N2222A, L, UA, UB, UBC		75	325	
I_C = 10mAdc, V_{CE} = 10Vdc	2N2221A, L, UA, UB, UBC		40		
	2N2222A, L, UA, UB, UBC		100		
I_C = 150mAdc, V_{CE} = 10Vdc	2N2221A, L, UA, UB, UBC		40	120	
	2N2222A, L, UA, UB, UBC		100	300	
I_C = 500mAdc, V_{CE} = 10Vdc	2N2221A, L, UA, UB, UBC		20		
	2N2222A, L, UA, UB, UBC		30		
Collector-Emitter Saturation Voltage					
I_C = 150mAdc, I_B = 15mAdc		$V_{CE(sat)}$		0.3	Vdc
I_C = 500mAdc, I_B = 50mAdc				1.0	
Base-Emitter Voltage					
I_C = 150mAdc, I_B = 15mAdc		$V_{BE(sat)}$	0.6	1.2	Vdc
I_C = 500mAdc, I_B = 50mAdc				2.0	

DYNAMIC CHARACTERISTICS

Parameters / Test Conditions		Symbol	Min.	Max.	Unit
Small-Signal Short-Circuit Forward Current Transfer Ratio					
I_C = 1.0mAdc, V_{CE} = 10Vdc, f = 1.0kHz	2N2221A, L, UA, UB, UBC	h_{fe}		30	
	2N2222A, L, UA, UB, UBC			50	
Magnitude of Small–Signal Short-Circuit Forward Current Transfer Ratio					
I_C = 20mAdc, V_{CE} = 20Vdc, f = 100MHz		$\|h_{fe}\|$		2.5	
Output Capacitance					
V_{CB} = 10Vdc, I_E = 0, 100kHz ≤ f ≤ 1.0MHz		C_{obo}		8.0	pF
Input Capacitance					
V_{EB} = 0.5Vdc, I_C = 0, 100kHz ≤ f ≤ 1.0MHz		C_{ibo}		25	pF

SWITCHING CHARACTERISTICS

Parameters / Test Conditions	Symbol	Min.	Max.	Unit
Turn-On Time See figure 8 of MIL-PRF-19500/255	t_{on}		35	ηs
Turn-Off Time See Figure 9 of MIL-PRF-19500/255	t_{off}		300	ηs

(2) Pulse Test: Pulse Width = 300μs, Duty Cycle ≤ 2.0%.