Micro Commercial Components

Micro Commercial Components
20736 Marilla Street Chatsworth
CA 91311
Phone: (818) 701-4933
Fax: (818) 701-4939

2N2219A

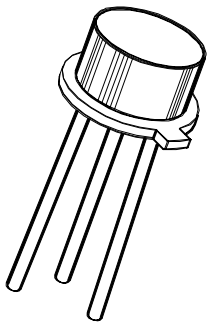
SWITCHING TRANSISTOR

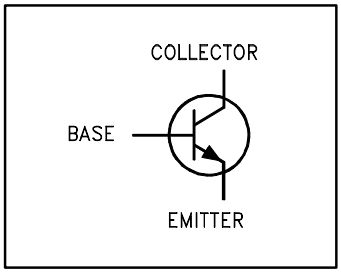
SMALL SIGNAL BIPOLAR *NPN* SILICON

Features

- Collector - Base Voltage 75 V
- Collector - Current 800 mA
- Medium Current, Bipolar Transistor
- Marking: Type number
- Lead Free Finish/RoHS Compliant(Note 1) ("P" Suffix designates RoHS Compliant. See ordering information)

TO-39





ABSOLUTE MAXIMUM RATINGS

Collector - Emitter Voltage	V_{CEO}	50	Vdc
Collector - Base Voltage	V_{CBO}	75	Vdc
Emitter - Base Voltage	V_{EBO}	6	Vdc
Collector Current - Continuous	I_C	800	mAdc
Total Device Dissipation @ T_A = 25 °C	P_D	0.8	WATTS
Derate above 25 °C		4.6	mW/°C
Total Device Dissipation @ T_C = 25 °C	P_D	1.0	WATTS
Derate above 25 °C		17.0	mW/°C
Operating Junction&Storage Temperature Range	T_J, T_{stg}	- 55 to +200	°C

Thermal Characteristics

CHARACTERISTIC	SYMBOL	MAX	UNIT
Thermal Resistance, Junction to Ambient	Rθ JA	217	°C/W
Thermal Resistance, Junction to Case	Rθ JC	59	°C/W

Notes:1.High Temperature Solder Exemption Applied, see EU Directive Annex 7.

Electrical Characteristics (T_A = 25°C unless otherwise noted)

OFF CHARACTERISTIC	SYMBOL	MIN	MAX	UNIT
Collector - Emitter Breakdown Voltage (1)	$V(BR)_{CEO}$			
(I_C = 10 mA dc, I_B = 0)		50		Vdc
Collector - Base Breakdown Voltage	$V(BR)_{CBO}$			
(I_C = 10 µAdc, I_E = 0)		75		Vdc
Emitter - Base Breakdown Voltage	$V(BR)_{EBO}$			
(I_E = 10 µAdc, I_C = 0)		6		Vdc
Collector - Emitter Cutoff Current	I_{CES}			
(V_{CE} = 50 Vdc)			10	nAdc
Collector - Base Cutoff Current	I_{CBO}			
(V_{CB} = 60 Vdc, I_E = 0)			10	nAdc
(V_{CB} = 60 Vdc, I_E = 0, T_A = 150 °C)			10	µAdc
Emitter - Base Cutoff Current	I_{EBO}			
(V_{EB} = 4 Vdc)			10	nAdc
(V_{EB} = 6 Vdc)			10	µAdc

ON CHARACTERISTIC	SYMBOL	MIN	MAX	UNIT
DC Current Gain	h_{FE}			
(I_C = 0.1 mA dc, V_{CE} = 10 Vdc) (1)		50		
(I_C = 1 mA dc, V_{CE} = 10 Vdc) (1)		75	325	
(I_C = 10 mA dc, V_{CE} = 10 Vdc) (1)		100		
(I_C = 150 mA dc, V_{CE} = 10 Vdc) (1)		100	300	
(I_C = 500 mA dc, V_{CE} = 10 Vdc) (1)		30		
(I_C = 10 mA dc, V_{CE} = 10 Vdc, T_J = -55°C) (1)		35		
Collector - Emitter Saturation Voltage	$V_{CE(sat)}$			
(I_C = 150 mAdc, I_B = 15 mAdc) (1)			0.3	Vdc
(I_C = 500 mAdc, I_B = 50 mAdc) (1)			1.0	Vdc
Base - Emitter Saturation Voltage	$V_{BE(sat)}$			
(I_C = 150 mAdc, I_B = 15 mAdc) (1)		0.6	1.2	Vdc
(I_C = 500 mAdc, I_B = 50 mAdc) (1)			2.0	Vdc

1. Pulse Test: Pulse Width ≤ 300 µs, Duty Cycle ≤.2%

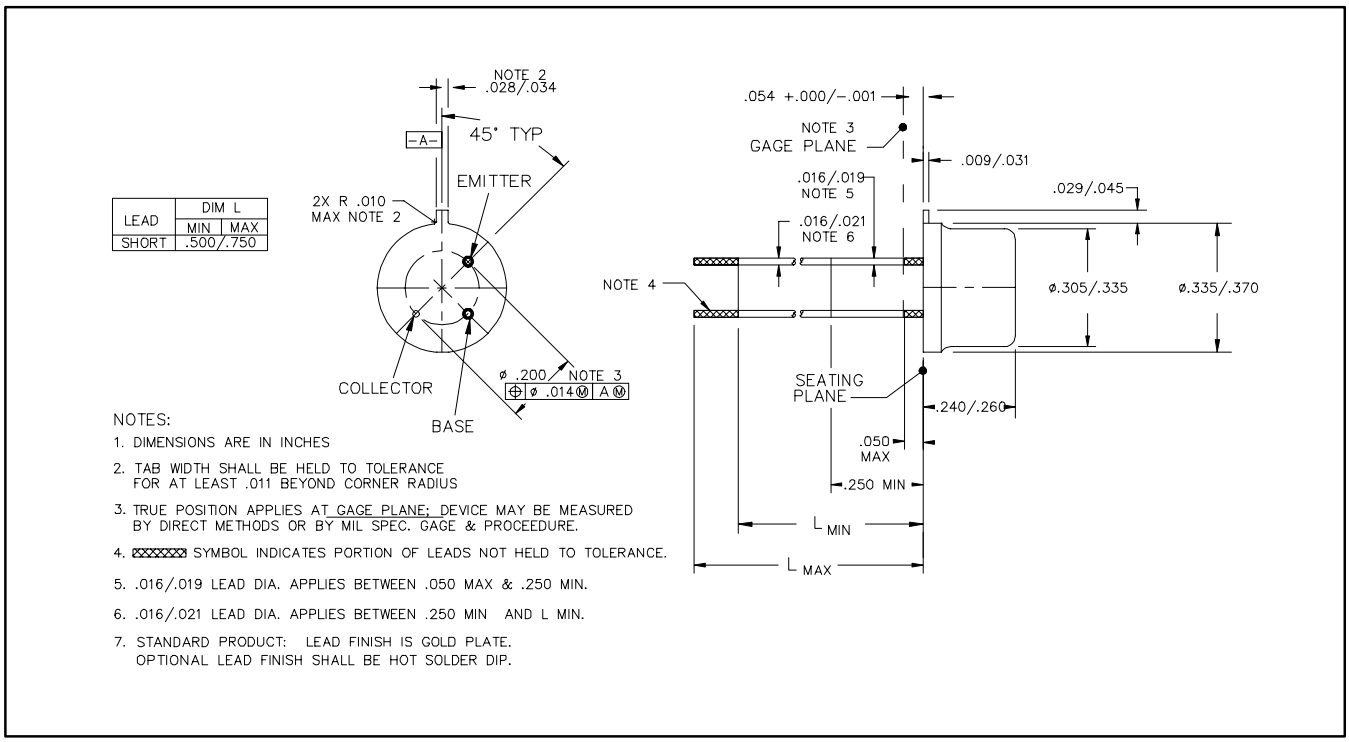
Electrical Characteristics (T_A = 25°C unless otherwise noted)

SMALL - SIGNAL CHARACTERISTICS	SYMBOL	MIN	MAX	UNIT
Output Capacitance	C_{obo}			
(V_{CB} = 10 Vdc, I_E = 0, 100kHz ≤ f ≤ 1 MHz)			8.0	pF
Input Capacitance	C_{ibo}			
(V_{EB} = 0.5 Vdc, I_C = 0, 100kHz ≤ f ≤ 1 MHz)			25	pF

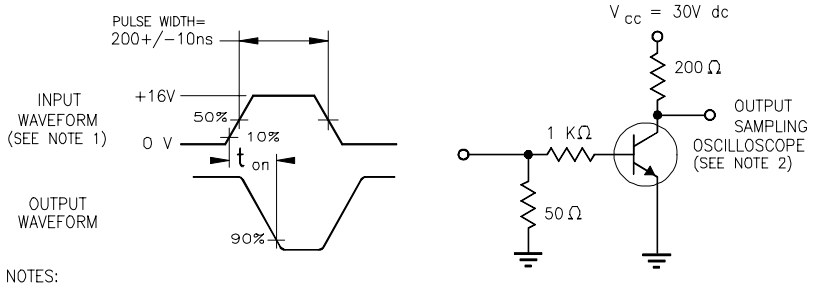
SWITCHING CHARACTERISTICS	SYMBOL	MIN	MAX	UNIT
Turn - On Time	t_{on}			
(V_{CC} = 30 Vdc, I_C = 150 mAdc,				
I_{B1} =15 mAdc) (See FIGURE 1)			35	ns
Turn - Off Time	t_{off}			
(V_{CC} = 30 Vdc, I_C = 150 mAdc,				
I_{B1} = - I_{B2} = 15 mAdc) (See FIGURE 2)			300	ns

Small - Signal AC Characteristics (T_A = 25°C)

LOW FREQUENCY	SYMBOL	MIN	MAX	UNIT
Common - Emitter Forward Current Transfer Ratio	h_{fe}			
(I_C = 1 mA, V_{CE} = 10 V, f = 1kHz)		75		
HIGH FREQUENCY				
Common - Emitter Forward Current Transfer Ratio	$\|h_{fe}\|$			
(I_C = 20 mA, V_{CE} = 20 V, f = 100 MHz)		2.5	12	



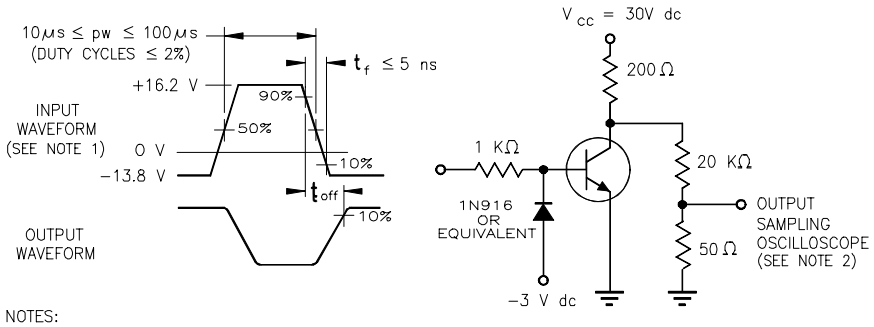
TO-39 CASE OUTLINE



NOTES:

1. The rise time (t_r) of the applied pulse shall be ≤ 2.0 ns, duty cycle ≤ 2 percent, and the generator source impedance shall be 50 ohms.
2. Sampling oscilloscope: Z_{in} ≤ 100 K ohms, C_{in} ≤ 12 pF, rise time ≤ 5 ns.

FIGURE 1 Saturated Turn-on Time Test Circuit



NOTES:

1. The rise time (t_r) of the applied pulse shall be ≤ 2.0 ns, duty cycle ≤ 2 percent, and the generator source impedance shall be 50 ohms.
2. Sampling oscilloscope: Z_{in} ≤ 100 K ohms, C_{in} ≤ 12 pF, rise time ≤ 5 ns.

FIGURE 2 Saturated Turn-off Time Test Circuit

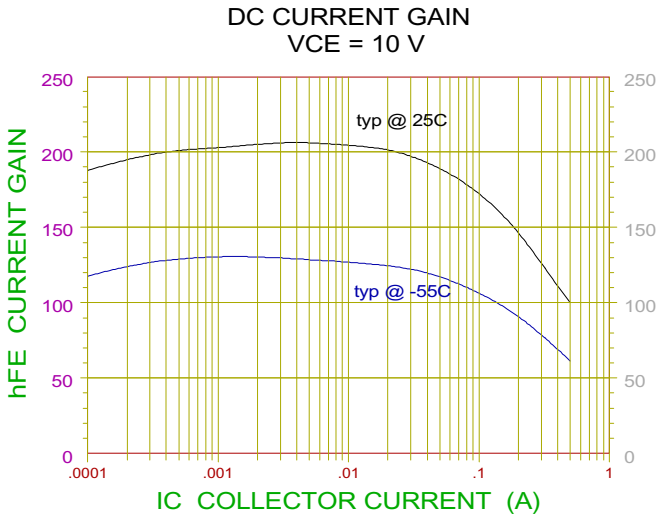


FIGURE 3

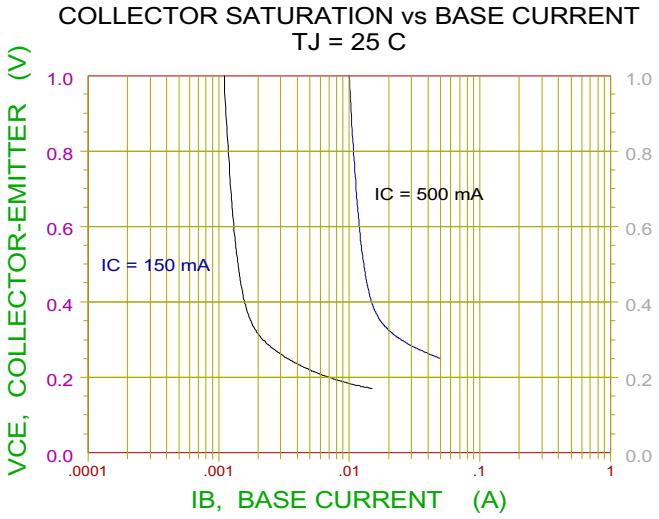


FIGURE 4

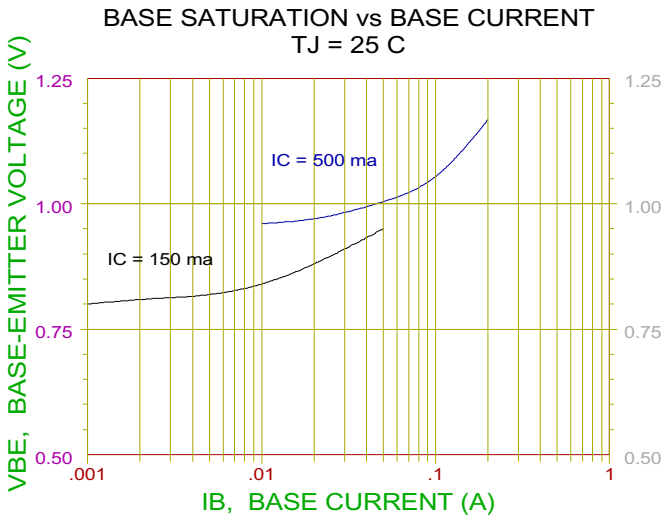


FIGURE 5

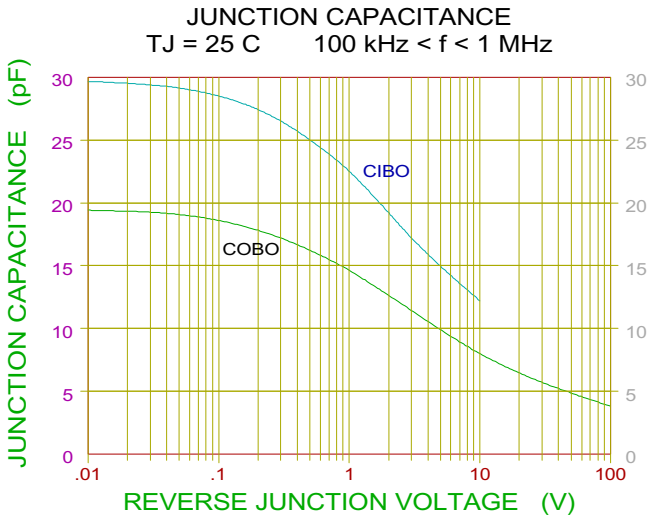


FIGURE 6

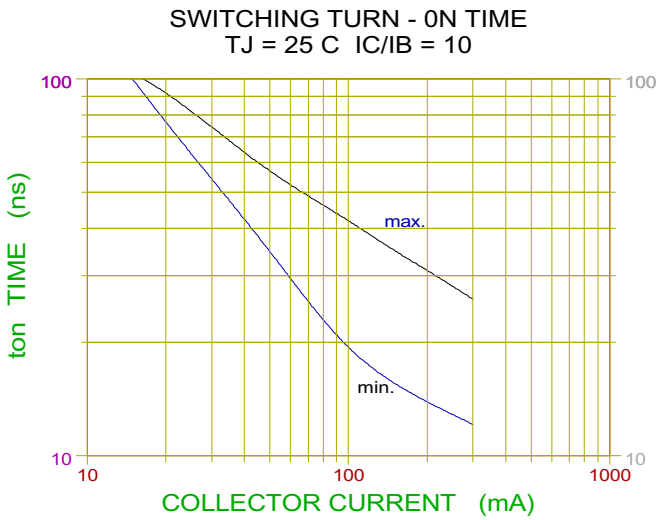


FIGURE 7

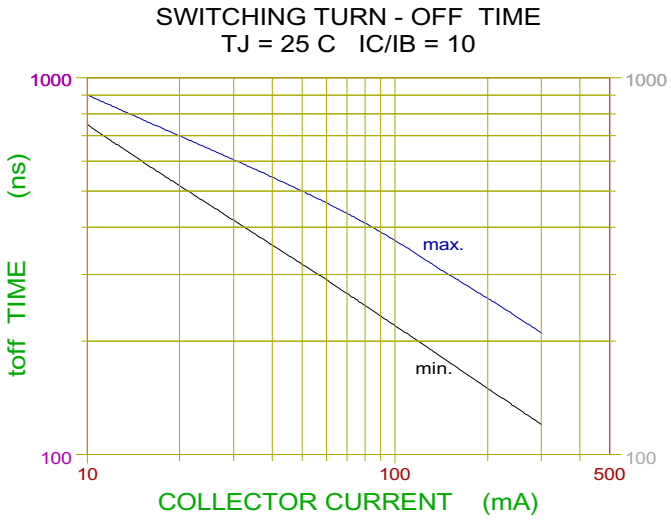


FIGURE 8

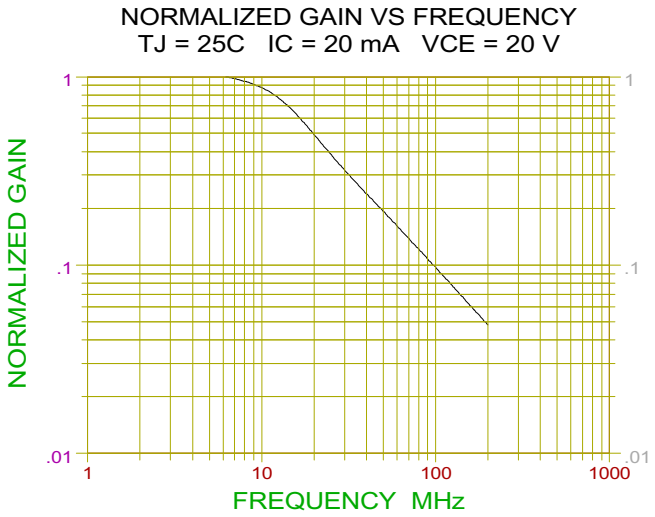

NORMALIZED GAIN VS FREQUENCY
TJ = 25C IC = 20 mA VCE = 20 V
NORMALIZED GAIN
1
.1
.01
1
10
100
1000
FREQUENCY MHz

FIGURE 9

Micro Commercial Components

Ordering Information :

Device	Packing
Part Number-BP	Bulk;50pcs/Box

IMPORTANT NOTICE
Micro Commercial Components Corp. reserves the right to make changes without further notice to any product herein to make corrections, modifications , enhancements , improvements , or other changes . ***Micro Commercial Components Corp .*** does not assume any liability arising out of the application or use of any product described herein; neither does it convey any license under its patent rights ,nor the rights of others . The user of products in such applications shall assume all risks of such use and will agree to hold ***Micro Commercial Components Corp .*** and all the companies whose products are represented on our website, harmless against all damages.
LIFE SUPPORT
MCC's products are not authorized for use as critical components in life support devices or systems without the express written approval of Micro Commercial Components Corporation.
CUSTOMER AWARENESS
Counterfeiting of semiconductor parts is a growing problem in the industry. Micro Commercial Components (MCC) is taking strong measures to protect ourselves and our customers from the proliferation of counterfeit parts. MCC strongly encourages customers to purchase MCC parts either directly from MCC or from Authorized MCC Distributors who are listed by country on our web page cited below. Products customers buy either from MCC directly or from Authorized MCC Distributors are genuine parts, have full traceability, meet MCC's quality standards for handling and storage. **MCC will not provide any warranty coverage or other assistance for parts bought from Unauthorized Sources.** MCC is committed to combat this global problem and encourage our customers to do their part in stopping this practice by buying direct or from authorized distributors.