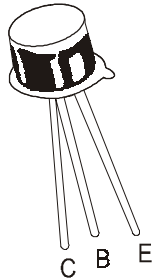


**NPN SILICON PLANAR SWITCHING TRANSISTORS**

**2N2221**

**2N2222**



**TO-18**

**Metal Can Package**

**Switching and Linear Application DC and VHF Amplifier Applications**

**ABSOLUTE MAXIMUM RATINGS (Ta=25°C unless specified otherwise)**

DESCRIPTION	SYMBOL	2N2221, 22	UNIT
Collector Emitter Voltage	$V_{CEO}$	30	V
Collector Base Voltage	$V_{CBO}$	60	V
Emitter Base Voltage	$V_{EBO}$	5	V
Collector Current Continuous	$I_C$	800	mA
Power Dissipation @Ta=25°C	$P_D$	500	mW
Derate Above 25°C		2.28	mW/°C
Power Dissipation @ Tc=25°C	$P_D$	1.2	W
Derate Above 25°C		6.85	mW/°C
Operating and Storage Junction Temperature Range	$T_j, T_{stg}$	-65 to +200	°C

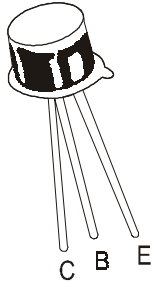
**ELECTRICAL CHARACTERISTICS (Ta=25°C unless specified otherwise )**

DESCRIPTION	SYMBOL	TEST CONDITION	VALUE		UNIT
			MIN	MAX	
Collector Emitter Breakdown Voltage	$BV_{CEO}$	$I_C=10mA, I_B=0$	30		V
Collector Base Breakdown Voltage	$BV_{CBO}$	$I_C=10\mu A, I_E=0$	60		V
Emitter Base Breakdown Voltage	$BV_{EBO}$	$I_E=10\mu A, I_C=0$	5		V
Collector Leakage Current	$I_{CBO}$	$V_{CB}=50V, I_E=0$		10	nA
				10	$\mu A$
Collector Emitter Saturation Voltage	$V_{CE(Sat)}$ *	$I_C=150mA, I_B=15mA$		0.4	V
		$I_C=500mA, I_B=50mA$		1.6	V
Base Emitter Saturation Voltage	$V_{BE(Sat)}$ *	$I_C=150mA, I_B=15mA$	0.6	1.3	V
		$I_C=500mA, I_B=50mA$		2.6	V

# NPN SILICON PLANAR SWITCHING TRANSISTORS

2N2221

2N2222



TO-18  
Metal Can Package

## ELECTRICAL CHARACTERISTICS (Ta=25°C unless specified otherwise)

DESCRIPTION	SYMBOL	TEST CONDITION	2221		2222		UNIT
			MIN	MAX	MIN	MAX	
DC Current Gain	$h_{FE}$	$I_C=0.1mA, V_{CE}=10V^*$	20		35		
		$I_C=1mA, V_{CE}=10V$	25		50		
		$I_C=10mA, V_{CE}=10V^*$	35		75		
		$I_C=150mA, V_{CE}=1V^*$	20		50		
		$I_C=150mA, V_{CE}=1V^*$	40	120	100	300	
		$I_C=500mA, V_{CE}=10V^*$	20		30		

## DYNAMIC CHARACTERISTICS

Transition Frequency	$f_T$	$I_C=20mA, V_{CE}=20V$ $f=100MHz$	250		250		MHz
Output Capacitance	$C_{ob}$	$V_{CB}=10V, I_E=0$ $f=100KHz$		8		8	pF
Input Capacitance	$C_{ib}$	$V_{EB}=0.5V, I_C=0$ $f=100kHz$		30		30	pF

## SWITCHING CHARACTERISTICS

Delay time	$t_d$				10		ns
		$I_C=150mA, I_{B1}=15mA$					
Rise time	$t_r$	$V_{CC}=30V, V_{BE(off)}=0.5V$			25		ns
Storage time	$t_s$				225		ns
		$I_C=150mA, I_{B1}=15mA$					
Fall time	$t_f$	$I_{B2}=15mA, V_{CC}=30V$			60		ns

\*Pulse Condition: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$

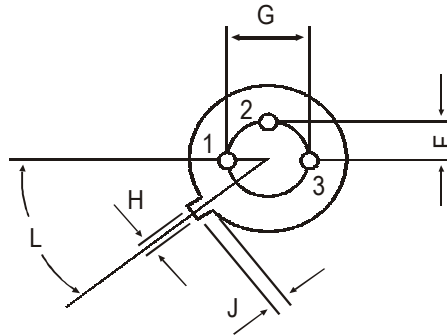
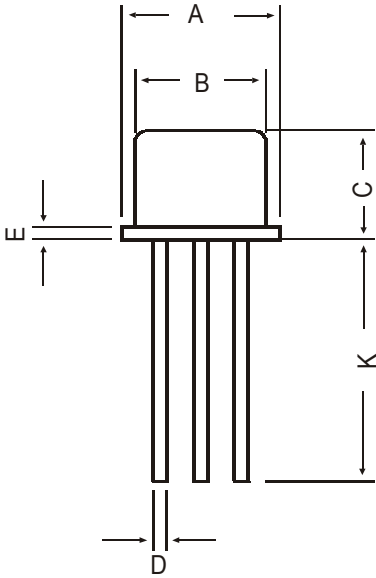
2N2221

2N2222

TO-18

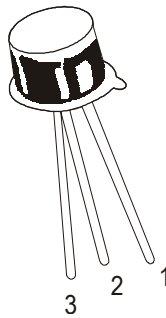
Metal Can Package

### TO-18 Metal Can Package



All dimensions in mm.

DIM	MIN	MAX
A	5.24	5.84
B	4.52	4.97
C	4.31	5.33
D	0.40	0.53
E	—	0.76
F	—	1.27
G	—	2.97
H	0.91	1.17
J	0.71	1.21
K	12.70	—
L	45 DEG	



#### PIN CONFIGURATION

1. EMITTER
2. BASE
3. COLLECTOR

### Packing Detail

PACKAGE	STANDARD PACK		INNER CARTON BOX		OUTER CARTON BOX		
	Details	Net Weight/Qty	Size	Qty	Size	Qty	Gr Wt
TO-18	1K/polybag	350 gm/1K pcs	3" x 7.5" x 7.5"	5K	17" x 15" x 13.5"	80K	34 kgs

### **Disclaimer**

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