2N2221A
2N2222A

SILICON
NPN TRANSISTORS

TO-18 CASE

Central Semiconductor Corp.

www.centralsemi.com

DESCRIPTION:

The CENTRAL SEMICONDUCTOR 2N2221A and 2N2222A are silicon NPN epitaxial planar transistors designed for small signal, general purpose switching applications.

MARKING: FULL PART NUMBER

MAXIMUM RATINGS: (T_A=25°C)	**SYMBOL**		**UNITS**
Collector-Base Voltage	V_{CBO}	75	V
Collector-Emitter Voltage	V_{CEO}	40	V
Emitter-Base Voltage	V_{EBO}	6.0	V
Continuous Collector Current	I_C	800	mA
Power Dissipation	P_D	500	mW
Power Dissipation (T_C=25°C)	P_D	1.8	W
Operating and Storage Junction Temperature	T_J, T_{stg}	-65 to +200	°C
Thermal Resistance	Θ_{JA}	350	°C/W
Thermal Resistance	Θ_{JC}	97	°C/W

ELECTRICAL CHARACTERISTICS: (T_A=25°C unless otherwise noted)

SYMBOL	**TEST CONDITIONS**	**MIN**	**MAX**	**UNITS**
I_{CBO}	V_{CB}=60V		10	nA
I_{CBO}	V_{CB}=60V, T_A=150°C		10	µA
I_{CEV}	V_{CE}=60V, V_{EB}=3.0V		10	nA
I_{EBO}	V_{EB}=3.0V		10	nA
BV_{CBO}	I_C=10µA	75		V
BV_{CEO}	I_C=10mA	40		V
BV_{EBO}	I_E=10µA	6.0		V
$V_{CE(SAT)}$	I_C=150mA, I_B=15mA		0.3	V
$V_{CE(SAT)}$	I_C=500mA, I_B=50mA		1.0	V
$V_{BE(SAT)}$	I_C=150mA, I_B=15mA	0.6	1.2	V
$V_{BE(SAT)}$	I_C=500mA, I_B=50mA		2.0	V

		2N2221A		**2N2222A**	
		MIN	**MAX**	**MIN**	**MAX**
h_{FE}	V_{CE}=10V, I_C=0.1mA	20	-	35	-
h_{FE}	V_{CE}=10V, I_C=1.0mA	25	-	50	-
h_{FE}	V_{CE}=10V, I_C=10mA	35	-	75	-
h_{FE}	V_{CE}=10V, I_C=10mA, T_A=-55°C	15	-	35	-
h_{FE}	V_{CE}=10V, I_C=150mA	40	120	100	300
h_{FE}	V_{CE}=1.0V, I_C=150mA	20	-	50	-
h_{FE}	V_{CE}=10V, I_C=500mA	25	-	40	-

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2N2221A
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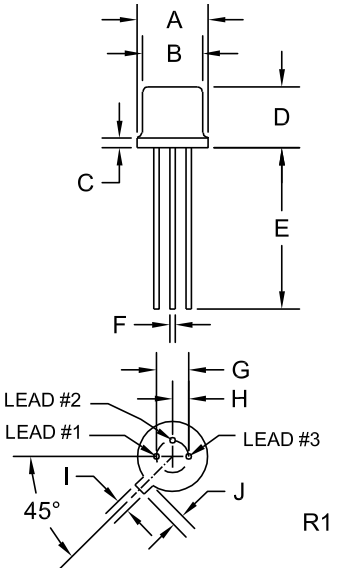
ELECTRICAL CHARACTERISTICS - Continued: (T_A=25°C)

SYMBOL	TEST CONDITIONS	2N2221A MIN	2N2221A MAX	2N2222A MIN	2N2222A MAX	UNITS
f_T	V_{CE}=20V, I_C=20mA, f=100MHz	250	-	300	-	MHz
C_{ob}	V_{CB}=10V, I_E=0, f=100kHz	-	8.0	-	8.0	pF
C_{ib}	V_{EB}=0.5V, I_C=0, f=100kHz	-	25	-	25	pF
h_{ie}	V_{CE}=10V, I_C=1.0mA, f=1.0kHz	1.0	3.5	2.0	8.0	kΩ
h_{ie}	V_{CE}=10V, I_C=10mA, f=1.0kHz	0.2	1.0	0.25	1.25	kΩ
h_{re}	V_{CE}=10V, I_C=1.0mA, f=1.0kHz	-	5.0	-	8.0	$x10^{-4}$
h_{re}	V_{CE}=10V, I_C=10mA, f=1.0kHz	-	2.5	-	4.0	$x10^{-4}$
h_{fe}	V_{CE}=10V, I_C=1.0mA, f=1.0kHz	30	150	50	300	
h_{fe}	V_{CE}=10V, I_C=10mA, f=1.0kHz	50	300	75	375	
h_{oe}	V_{CE}=10V, I_C=1.0mA, f=1.0kHz	3.0	15	5.0	35	µS
h_{oe}	V_{CE}=10V, I_C=10mA, f=1.0kHz	10	100	25	200	µS
$rb'C_c$	V_{CB}=10V, I_E=20mA, f=31.8MHz	-	150	-	150	ps
NF	V_{CE}=10V, I_C=100µA, R_S=1.0kΩ, f=1.0kHz	-	-	-	4.0	dB
t_d	V_{CC}=30V, V_{BE}=0.5V, I_C=150mA, I_{B1}=15mA	-	10	-	10	ns
t_r	V_{CC}=30V, V_{BE}=0.5V, I_C=150mA, I_{B1}=15mA	-	25	-	25	ns
t_s	V_{CC}=30V, I_C=150mA, I_{B1}=I_{B2}=15mA	-	225	-	225	ns
t_f	V_{CC}=30V, I_C=150mA, I_{B1}=I_{B2}=15mA	-	60	-	60	ns

TO-18 CASE - MECHANICAL OUTLINE



DIMENSIONS				
	INCHES		MILLIMETERS	
SYMBOL	MIN	MAX	MIN	MAX
A (DIA)	0.209	0.230	5.31	5.84
B (DIA)	0.178	0.195	4.52	4.95
C	-	0.030	-	0.76
D	0.170	0.210	4.32	5.33
E	0.500	-	12.70	-
F (DIA)	0.016	0.019	0.41	0.48
G (DIA)	0.100		2.54	
H	0.050		1.27	
I	0.036	0.046	0.91	1.17
J	0.028	0.048	0.71	1.22

TO-18 (REV: R1)

LEAD CODE:
1) Emitter
2) Base
3) Collector

MARKING: FULL PART NUMBER

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