New Jersey Semi-Conductor Products, Inc.

20 STERN AVE.
SPRINGFIELD, NEW JERSEY 07081
U.S.A.

TELEPHONE: (973) 376-2922
(212) 227-6005
FAX: (973) 376-8960

COMPLEMENTARY SILICON MEDIUM-POWER TRANSISTORS

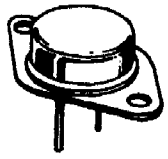
..designed for general-purpose power amplifier and switching applications.

NPN	PNP
2N4231A	2N6312
2N4232A	2N6313
2N4233A	2N6314

5 AMPERE
COMPLEMENTARY SILICON
POWER TRANSISTOR
40-80 VOLTS
75 WATTS

FEATURES:

* Low Collector-Emitter Saturation Voltage
  $V_{CE(sat)}$=0.7 V (Max.) @ I_C = 1.5 A
* Excellent DC Current Gain
  hFE = 25-100 @ I_C = 1.5 A
* Low Leakage Current- I_{CEX} =0.1 mA(Max)



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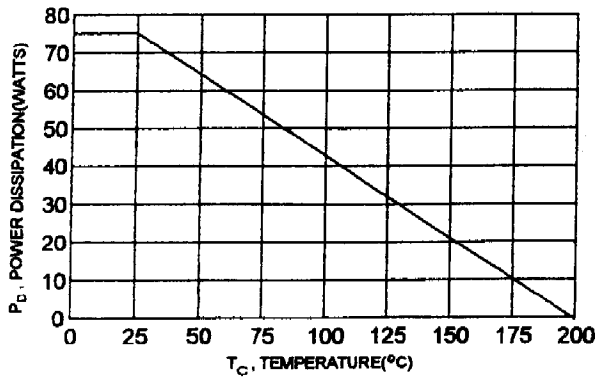
MAXIMUM RATINGS

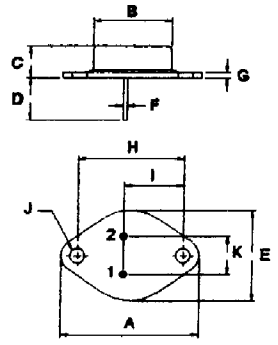
Characteristic	Symbol	2N4231A 2N6312	2N4232A 2N6313	2N4233A 2N6314	Unit
Collector-Emitter Voltage	V_{CEO}	40	60	80	V
COllector-Base Voltage	V_{CBO}	40	60	80	V
Emitter-Base Voltage	V_{EBO}	5.0			V
Collector Current-Continuous -Peak	I_C I_{CM}	5.0 10			A
Base Current	I_B	2.0			A
Total Power Dissipation @T_C= 25°C Derate above 25°C	P_D	75 0.43			W W/°C
Operating and Storage Junction Temperature Range	T_J , T_{STG}	- 65 to +200			°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance Junction to Case	Rθjc	2.32	°C/W

FIGURE -1 POWER DERATING





PIN 1.BASE
2.EMITTER
COLLECTOR(CASE)

DIM	MILLIMETERS	
	MIN	MAX
A	30.60	32.52
B	13.85	14.16
C	6.54	7.22
D	9.50	10.50
E	17.28	18.46
F	0.76	0.92
G	1.38	1.65
H	24.16	24.78
I	13.84	15.60
J	3.32	3.92
K	4.86	5.34

ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector - Emitter Sustaining Voltage (1) (I_C = 100 mA, I_B = 0)	2N4231A,2N6312 2N4232A,2N6313 2N4233A,2N6314	$V_{CEO(sus)}$	 40 60 80		V
Collector Cutoff Current (V_{CE} = 30 V, I_B = 0) (V_{CE} = 50 V, I_B = 0) (V_{CE} = 70 V, I_B = 0)	 2N4231A,2N6312 2N4232A,2N6313 2N4233A,2N6314	I_{CEO}		 1.0 1.0 1.0	mA
Collector-Emitter Leakage Current (V_{CE} = 40 V, $V_{BE(off)}$ =1.5 V) (V_{CE} = 60 V, $V_{BE(off)}$ =1.5 V) (V_{CE} = 80 V, $V_{BE(off)}$ =1:5 V) (V_{CE} = 40 V, $V_{BE(off)}$ =1.5 V , T_C = 125°C) (V_{CE} = 60 V, $V_{BE(off)}$ =1.5 V , T_C = 125°C) (V_{CE} = 80 V, $V_{BE(off)}$ =1.5 V , T_C = 125°C)	 2N4231A,2N6312 2N4232A,2N6313 2N4233A,2N6314 2N4231A,2N6312 2N4232A,2N6313 2N4233A,2N6314	I_{CEX}		 0.1 0.1 0.1 1.0 1.0 1.0	mA
Collector Cutoff Current (V_{CB} = 40 V, I_E = 0) (V_{CB} = 60 V, I_E = 0) (V_{CB} = 80 V, I_E = 0)	 2N4231A,2N6312 2N4232A,2N6313 2N4233A,2N6314	I_{CBO}		 50 50 50	uA
Emitter Cutoff Current (V_{EB} = 5.0 V, I_C = 0)		I_{EBO}		 0.5	mA
ON CHARACTERISTICS (1)					
DC Current Gain (I_C = 0.5 A, V_{CE} = 2.0 V) (I_C = 1.5 A, V_{CE} = 2.0 V) (I_C = 3.0 A, V_{CE} = 2.0 V) (I_C = 5.0 A, V_{CE} = 4.0 V)		hFE	 40 25 10 4.0	 100	
Collector-Emitter Saturation Voltage (I_C = 1.5 A, I_B = 0.15 A) (I_C = 3.0 A, I_B = 0.3 A) (I_C = 5.0 A, I_B = 1.25 A)		$V_{CE(sat)}$		 0.7 2.0 4.0	V
Base-Emitter Saturation Voltage (I_C = 1.5 A, V_{CE} = 2.0 V)		$V_{BE(on)}$		 1.4	V
DYNAMIC CHARACTERISTICS					
Current Gain - Bandwidth Product (2) (I_C =0.5 A, V_{CE} =10 V, f =1.0 MHz)		f_T	 4.0		MHz
Output Capacitance (V_{CB} =10 V, I_E =0, f = 0.1 MHz)		C_{ob}		 300	pF
Small-Signal Current Gain (I_C =0.5 A, V_{CE} =10 V, f =1.0 KHz)		h_{fe}	 20		

(1) Pulse Test: Pulse width = 300 us , Duty Cycle ≦ 2.0%

(2) $f_T = |h_{fe}| \cdot f_{test}$