

NPN SILICON TRANSISTORS 2SD1616, 2SD1616A

DESCRIPTION The 2SD1616/2SD1616A are designed for use in driver and output stages of AF amplifier, general purpose application.

FEATURES

- Low Collector Saturation Voltage.
 $V_{CE(sat)} = 0.15 \text{ V TYP. (@ } I_C = 1.0 \text{ A, } I_B = 50 \text{ mA)}$
- High Break Down Voltage.
 $V_{CEO} = 50 \text{ V/60 V (2SD1616/2SD1616A)}$
- High Total Power Dissipation. $P_T = 0.75 \text{ W (} T_a = 25^\circ \text{C)}$
- Complementary to the NEC 2SB1116/2SB1116A PNP Transistor.

ABSOLUTE MAXIMUM RATINGS

Maximum Temperatures

Storage Temperature $-55 \text{ to } +150^\circ \text{C}$

Junction Temperature $150^\circ \text{C Maximum}$

Maximum Power Dissipation ($T_a = 25^\circ \text{C}$)

Total Power Dissipation 0.75 W

Maximum Voltages and Currents ($T_a = 25^\circ \text{C}$)

2SD1616/2SD1616A

V_{CBO} Collector to Base Voltage 60 V/120 V

V_{CEO} Collector to Emitter Voltage 50 V/60 V

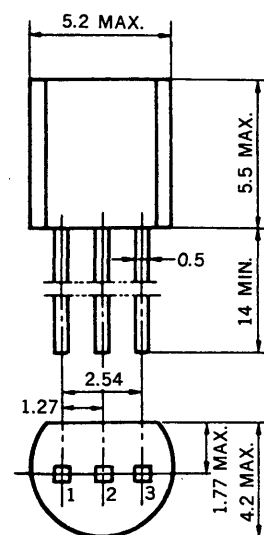
V_{EBO} Emitter to Base Voltage 6.0 V

I_C Collector Current (DC) 1.0 A

I_C Collector Current (pulse)* 2.0 A

*PW $\leq 10 \text{ ms}$, Duty Cycle $\leq 50 \%$

PACKAGE DIMENSIONS in millimeters



1. Emitter EIAJ : SC-43B
2. Collector JEDEC : TO-92
3. Base IEC : PA33

ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ \text{C}$)

2SD1616/2SD1616A

SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
h_{FE1}^{**}	DC Current Gain	135		600	—	$V_{CE} = 2.0 \text{ V, } I_C = 100 \text{ mA}$
h_{FE2}^{**}	DC Current Gain	81			—	$V_{CE} = 2.0 \text{ V, } I_C = 1.0 \text{ A}$
f_T	Gain Bandwidth Product	100	160		MHz	$V_{CE} = 2.0 \text{ V, } I_C = 100 \text{ mA}$
C_{ob}	Output Capacitance		19		pF	$V_{CB} = 10 \text{ V, } I_E = 0, f = 1.0 \text{ MHz}$
I_{CBO}	Collector Cutoff Current			100	nA	$V_{CB} = 60 \text{ V/120 V, } I_E = 0$
I_{EBO}	Emitter Cutoff Current			100	nA	$V_{EB} = 6.0 \text{ V, } I_C = 0$
V_{BE}^{**}	Base to Emitter Voltage	600		700	mV	$V_{CE} = 2.0 \text{ V, } I_C = 50 \text{ mA}$
$V_{CE(sat)}^{**}$	Collector Saturation Voltage		0.15	0.3	V	$I_C = 1.0 \text{ A, } I_B = 50 \text{ mA}$
$V_{BE(sat)}^{**}$	Base Saturation Voltage		0.9	1.2	V	$I_C = 1.0 \text{ A, } I_B = 50 \text{ mA}$
t_{on}	Turn-On Time		0.07		μs	$V_{CC} = 10 \text{ V, } I_C = 100 \text{ mA}$ $I_{B1} = -I_{B2} = 10 \text{ mA}$ $V_{BE(off)} = -2 \text{ to } 3 \text{ V}$
t_{stg}	Storage Time		0.95		μs	
t_f	Fall Time		0.07		μs	

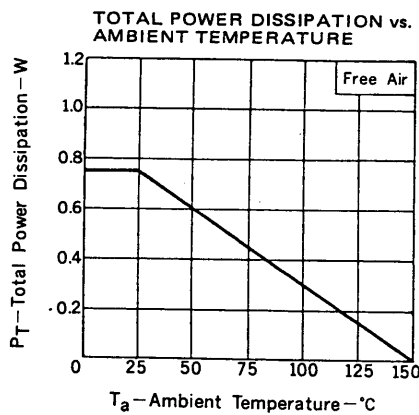
**Pulsed PW $\leq 350 \mu\text{s}$, Duty Cycle $\leq 2 \%$

Classification of h_{FE1}

Rank	L	K	U
Range	135 to 270	200 to 400	300 to 600

Test Conditions: $V_{CE} = 2.0 \text{ V, } I_C = 100 \text{ mA}$

TYPICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)



SAFE OPERATING AREAS (TRANSIENT THERMAL RESISTANCE METHOD)

