



THE DATASHEET OF
2N4398





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2N4398 & 2N4399 Silicon PNP Transistor High Power

Description:

The 2N4398 and 2N4399 are silicon PNP high power transistors in a TO3 type package designed for use in power amplifier and switching circuits.

Features:

- Low Collector–Emitter Saturation Voltage: $I_C = 15A$, $V_{CE(sat)} = 1.0V$ Max
- DC Current Gain Specified: 1.0 o 30A

Absolute Maximum Ratings:

Collector–Emitter Voltage, V_{CEO}		
2N4398	40V	
2N4399	60V	
Collector–Base Voltage, V_{CB}		
2N4398	40V	
2N4399	60V	
Emitter–Base Voltage, V_{EB}		5.0V
Collector Current, I_C		
Continuous	30A	
Peak	50A	
Base Current, I_B		
Continuous	7.5A	
Peak	15A	
Total Power Dissipation, P_D		
$T_A = +25^\circ C$	5W	
Derate Above $+25^\circ C$	28.8W/ $^\circ C$	
$T_C = +25^\circ C$	200W	
Derate Above $+25^\circ C$	1.15W/ $^\circ C$	
Operating Junction Temperature Range, T_j		-65° to $+200^\circ C$
Storage Temperature Range, T_{stg}		-65° to $+200^\circ C$
Thermal Resistance, Junction–to–Case, R_{thJC}		0.875 $^\circ C/W$
Thermal Resistance, Junction–to–Ambient, R_{thJA}		35 $^\circ C/W$

Electrical Characteristics: ($T_C = +25^\circ C$ unless otherwise specified)

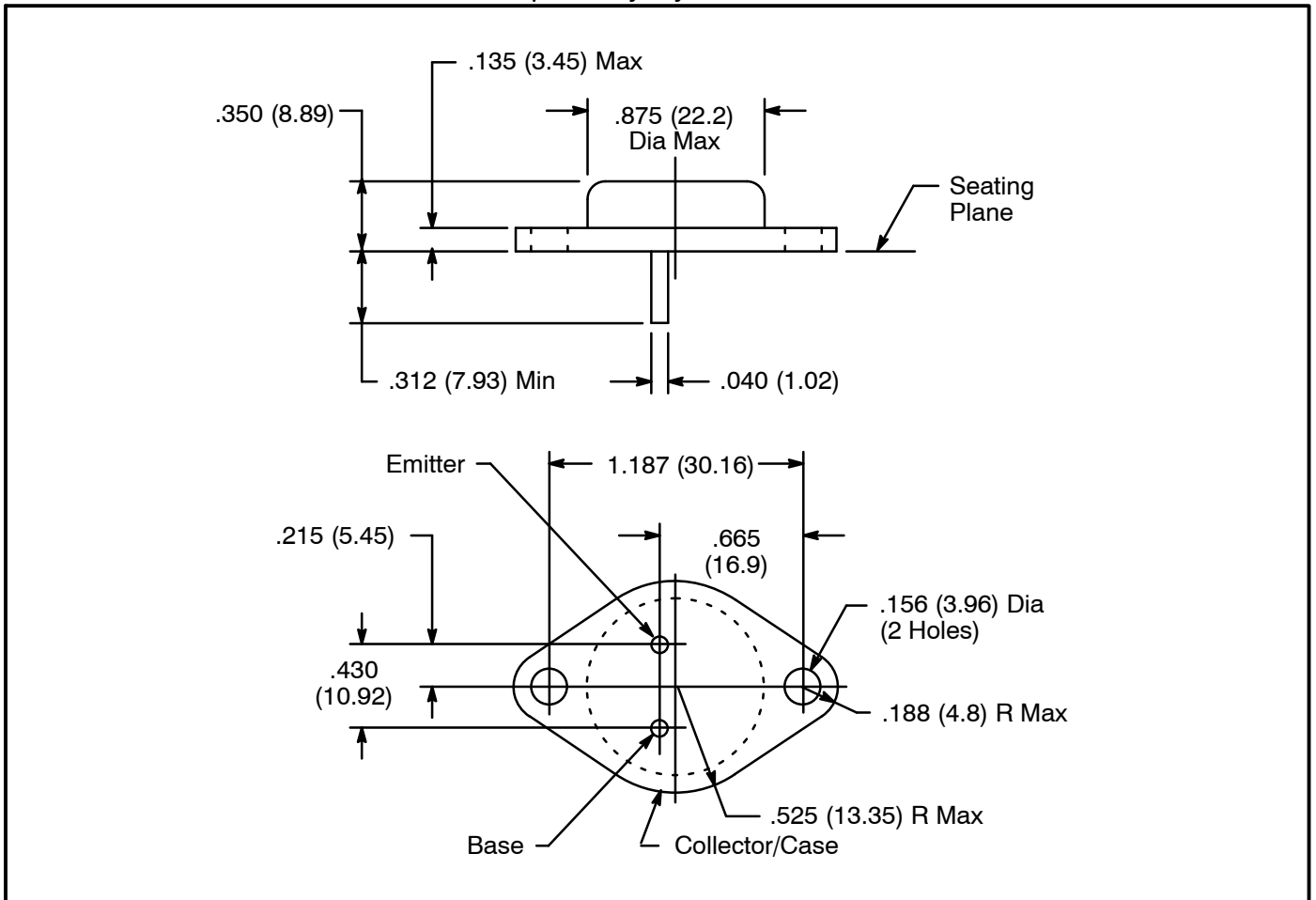
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Off Characteristics						
Collector–Emitter Sustaining Voltage	$V_{CEO(SUS)}$	$I_C = 200mA$, $I_B = 0$, Note 1	40	–	–	V
2N4398						
2N4399			60	–	–	V
Collector Cutoff Current	I_{CEO}	$V_{CE} = \text{Rated Value}$, $V_{BE(OFF)} = 1.5V$	–	–	5	mA
	I_{CEX}	$V_{CE} = 30V$, $V_{BE(OFF)} = 1.5V$	–	–	5	mA
					$T_C = +150^\circ C$	10
	I_{CBO}	$V_{CE} = \text{Rated Value}$, $I_E = 0$	–	–	1	mA
Emitter Cutoff Current	I_{EBO}	$V_{EB} = 5V$, $I_C = 0$	–	–	5	mA

Note 1. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.

Electrical Characteristics (Cont'd): ($T_C = +25^\circ\text{C}$ unless otherwise specified)


Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit	
On Characteristics (Note 1)							
DC Current Gain	h_{FE}	$V_{CE} = 2V$	$I_C = 1A$	40	-	-	
			$I_C = 15A$	15	-	60	
			$I_C = 30A$	5	-	-	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 10A, I_B = 1A$	-	-	0.75	V	
		$I_C = 15A, I_B = 1.5A$	-	-	1.0	V	
		$I_C = 20A, I_B = 2A$	-	-	2.0	V	
		$I_C = 30A, I_B = 6A$	-	-	4.0	V	
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 10A, I_B = 1A$	-	-	1.6	V	
		$I_C = 15A, I_B = 1.5A$	-	-	1.85	V	
		$I_C = 20A, I_B = 2A$	-	-	2.5	V	
Base-Emitter ON Voltage	$V_{BE(on)}$	$I_C = 15A, V_{CE} = 2V$	-	-	1.7	V	
		$I_C = 30A, V_{CE} = 4V$	-	-	3.0	V	
Dynamic Characteristics							
Current Gain Bandwidth Product	f_T	$I_C = 1A, V_{CE} = 10V, f = 1\text{MHz}$	4	-	-	MHz	
Small-Signal Current Gain	h_{fe}	$I_C = 1A, V_{CE} = 10V, f = 1\text{MHz}$	40	-	-		
Switching Characteristics							
Rise Time	t_r	$V_{CC} = 30V, I_C = 10A, I_{B1} = I_{B2} = 1A$	-	-	0.4	us	
Storage Time	t_s		-	-	1.5	us	
Fall Time	t_f		-	-	0.6	us	

Note 1. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$.



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