

2N3713/2N3714/2N3715/2N3716 - NPN
2N3789/2N3790/2N3791/2N3792 - PNP

EPITAXIAL-BASE NPN - PNP

The 2N3713, 2N3714, 2N3715 and 2N3716 are silicon epitaxial-base NPN power transistor in Jedec TO-3 metal case. They are intended for use in power linear and switching applications. The complementary PNP types are 2N3789, 2N3790, 2N3791 and 2N3792 respectively.

ABSOLUTE MAXIMUM RATINGS

Symbol	Ratings		Value	Unit	
V_{CBO}	Collector-Base Voltage	$I_E = 0$	2N3789 2N3791 2N3713 2N3715	80	V
			2N3790 2N3792 2N3714 2N3716	100	
V_{CEO}	Collector-Emitter Voltage	$I_B = 0$	2N3789 2N3791 2N3713 2N3715	60	V
			2N3790 2N3792 2N3714 2N3716	80	
V_{EBO}	Emitter-Base Voltage	$I_C = 0$	2N3789 2N3790 2N3791 2N3792 2N3713 2N3714 2N3715 2N3716	7.0	V

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Symbol	Ratings		Value	Unit
I_C	Collector Current	2N3789 2N3790 2N3791 2N3792 2N3713 2N3714 2N3715 2N3716	10	A
I_B	Base Current	2N3789 2N3790 2N3791 2N3792 2N3713 2N3714 2N3715 2N3716	4.0	A
P_D	Total Device Dissipation	@ $T_C = 25^\circ$ 2N3789 2N3790 2N3791 2N3792 2N3713 2N3714 2N3715 2N3716	150	Watts W/°C
T_J	Junction Temperature	2N3789 2N3790 2N3791 2N3792 2N3713 2N3714 2N3715 2N3716	-65 to +200	°C
T_S	Storage Temperature			

THERMAL CHARACTERISTICS

Symbol	Ratings		Value	Unit
R_{thJC}	Thermal Resistance, Junction to Case (Max)	2N3789 2N3790 2N3791 2N3792 2N3713 2N3714 2N3715 2N3716	1.17	°C/W

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ELETRICAL CHARACTERISTICS

TC=25°C unless otherwise noted

Symbol	Ratings	Test Condition(s)	Min	Typ	Mx	Unit	
$V_{CEO(SUS)}$	Collector-Emitter Sustaining Voltage	$I_C=200\text{ mA}, I_B=0\text{ (1)}$	2N3789 2N3791 2N3713 2N3715	60	-	-	V
			2N3790 2N3792 2N3714 2N3716	80	-	-	
I_{CEO}	Collector-Emitter Current	$V_{CE}=30\text{ V}, I_B=0$	2N3789 2N3791 2N3713 2N3715	-	-	0.7	mA
		$V_{CE}=40\text{ V}, I_B=0$	2N3790 2N3792 2N3714 2N3716	-	-	0.7	
I_{CEV}	Collector Cutoff Current	$V_{CE}=80\text{ V}, V_{EB}=-1.5\text{ V}$	2N3789 2N3791 2N3713 2N3715	-	-	1.0	mA
		$V_{CE}=100\text{ V}, V_{EB}=-1.5\text{ V}, T_C = 150^\circ\text{C}$	2N3790 2N3792 2N3714 2N3716	-	-	1.0	
		$V_{CE}=60\text{ V}, V_{EB}=-1.5\text{ V}, T_C = 150^\circ\text{C}$	2N3789 2N3791 2N3713 2N3715	-	-	10	
		$V_{CE}=80\text{ V}, V_{EB(off)}=-1.5\text{ V}, T_C = 150^\circ\text{C}$	2N3790 2N3792 2N3714 2N3716	-	-	10	
I_{EBO}	Emitter Cutoff Current	$V_{BE}=7.0\text{ V}, I_C=0$	2N3789 2N3790 2N3791 2N3792 2N3713 2N3714 2N3715 2N3716	-	-	5.0	mA

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Symbol	Ratings	Test Condition(s)	Min	Typ	Mx	Unit			
h_{FE}	DC Current Gain (1) (2)	I _C =1.0 A, V _{CE} =2.0 V	2N3713 2N3714 2N3789 2N3790	25	-	90	-		
			2N3715 2N3716	50	-	150			
			2N3791 2N3792	50	-	180			
			2N3713 2N3714 2N3789 2N3790	15	-	-			
			2N3715 2N3716 2N3791 2N3792	30	-	-			
			2N3713 2N3714 2N3715 2N3716 2N3789 2N3790 2N3791 2N3792	5.0	-	-			
		I _C =3.0 A, V _{CE} =2.0 V	I _C =10 A, V _{CE} =4.0 V	2N3713 2N3714 2N3789 2N3790	-	-		-	-
				2N3715 2N3716 2N3791 2N3792					
				2N3713 2N3714 2N3715 2N3716 2N3789 2N3790 2N3791 2N3792					
				2N3713 2N3714 2N3789 2N3790					
				2N3715 2N3716					
				2N3789 2N3790					
V_{CE(SAT)}	Collector-Emitter saturation Voltage (1) (2)	I _C =5.0 A, I _B =0.5 A	2N3713 2N3714 2N3791 2N3792	-	-	1.0	V		
			2N3715 2N3716	-	-	0.8			
		I _C =4.0 Adc, I _B =0.5 Adc	2N3789 2N3790	-	-	1.0			
			2N3713 2N3714 2N3789 2N3790	-	-	2.0			
V_{BE(SAT)}	Base-Emitter Saturation Voltage (1) (2)	I _C =5.0 Adc, I _B =0.5 Adc	2N3715 2N3716 2N3791 2N3792	-	-	1.5	V		
			2N3713 2N3714	-	-	2.0			
			2N3715 2N3716	-	-	1.8			
			2N3713 2N3714 2N3715 2N3716	-	-	4.0			
V_{BE}	Base-Emitter Voltage (1) (2)	I _C =5.0 Adc, V _{CE} =2.0 Vdc	2N3713 2N3714	-	-	2.0	V		
			2N3715 2N3716	-	-	1.8			
		I _C =10 A, V _{CE} =4.0 V	2N3713 2N3714	-	-	4.0			
			2N3715 2N3716	-	-	4.0			

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Symbol	Ratings	Test Condition(s)	Min	Typ	Mx	Unit
h_{fe}	Small Signal Current Gain	$V_{CE}=10\text{ V}$, $I_C=0.5\text{ A}$, $f=1.0\text{ kHz}$	25	-	250	-
$ h_{fe} $	Small Signal	$V_{CE}=10\text{ V}$, $I_C=0.5\text{ A}$, $f=1.0\text{ MHz}$	4	-	4	-

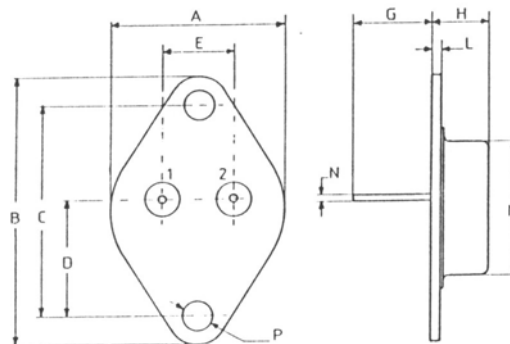
(1) Pulse Width $\approx 300\ \mu\text{s}$, Duty Cycle $\angle 2.0\%$

(2) These parameters are measured with voltage sensing contacts separate from the current carrying contacts

For PNP types current and voltage values are negative.

MECHANICAL DATA CASE TO-3

DIMENSIONS		
	mm	inches
A	25,51	1,004
B	38,93	1,53
C	30,12	1,18
D	17,25	0,68
E	10,89	0,43
G	11,62	0,46
H	8,54	0,34
L	1,55	0,6
M	19,47	0,77
N	1	0,04
P	4,06	0,16



Pin 1 :	Base
Pin 2 :	Emitter
Case :	Collector

*Information furnished is believed to be accurate and reliable. However, CS assumes no responsibility for the consequences of use of such information nor for errors that could appear.
 Data are subject to change without notice.*