

**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	$I_C=200\text{ mA}$ , $I_B=0$ (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
<b><math>h_{FE}</math></b>	DC Current Gain (1) (2)	$I_C=1.0\text{ A}$ , $V_{CE}=2.0\text{ V}$	2N3713 2N3714 2N3789 2N3790	25	-	90	-
			2N3715 2N3716	50	-	150	
			2N3791 2N3792	50	-	180	
		$I_C=3.0\text{ A}$ , $V_{CE}=2.0\text{ V}$	2N3713 2N3714 2N3789 2N3790	15	-	-	
			2N3715 2N3716 2N3791 2N3792	30	-	-	
		$I_C=10\text{ A}$ , $V_{CE}=4.0\text{ V}$	2N3713 2N3714 2N3715 2N3716 2N3789 2N3790 2N3791 2N3792	5.0	-	-	
<b><math>V_{CE(SAT)}</math></b>	Collector-Emitter saturation Voltage (1) (2)	$I_C=5.0\text{ A}$ , $I_B=0.5\text{ A}$	2N3713 2N3714 2N3791 2N3792	-	-	1.0	V
			2N3715 2N3716	-	-	0.8	
		$I_C=4.0\text{ Adc}$ , $I_B=0.5\text{ Adc}$	2N3789 2N3790	-	-	1.0	
<b><math>V_{BE(SAT)}</math></b>	Base-Emitter Saturation Voltage (1) (2)	$I_C=5.0\text{ Adc}$ , $I_B=0.5\text{ Adc}$	2N3713 2N3714 2N3789 2N3790	-	-	2.0	V
			2N3715 2N3716 2N3791 2N3792	-	-	1.5	
<b><math>V_{BE}</math></b>	Base-Emitter Voltage (1) (2)	$I_C=5.0\text{ Adc}$ , $V_{CE}=2.0\text{ Vdc}$	2N3713 2N3714	-	-	2.0	V
			2N3715 2N3716	-	-	1.8	
		$I_C=10\text{ A}$ , $V_{CE}=4.0\text{ V}$	2N3713 2N3714 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	-

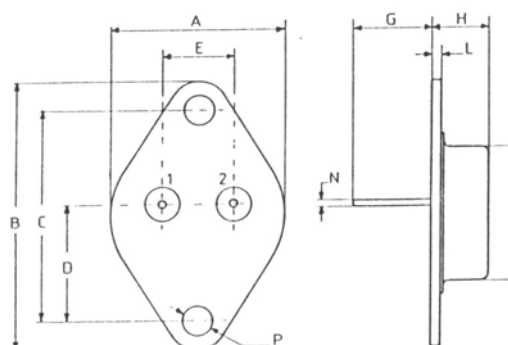
(1) Pulse Width  $\approx 300\text{ }\mu\text{s}$ , Duty Cycle  $\angle 2.0\%$

(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.*