

## NPN 2N3713 – 2N3714 – 2N3715 – 2N3716

### EPITAXIAL-BASE TRANSISTORS

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. Compliance to RoHS.

#### ABSOLUTE MAXIMUM RATINGS

Symbol	Ratings		Value	Unit
$V_{CBO}$	Collector-Base Voltage	$I_E = 0$	2N3713	V
			2N3715	
			2N3714	
			2N3716	
$V_{CEO}$	Collector-Emitter Voltage	$I_B = 0$	2N3713	V
			2N3715	
			2N3714	
			2N3716	
$V_{EBO}$	Emitter-Base Voltage	$I_C = 0$	7.0	V
$I_C$	Collector Current		10	A
$I_B$	Base Current		4.0	A
$P_D$	Total Device Dissipation	@ $T_C = 25^\circ$	150	W
$T_J$	Junction Temperature		-65 to +200	$^\circ\text{C}$
$T_S$	Storage Temperature			

#### THERMAL CHARACTERISTICS

Symbol	Ratings	Value	Unit
$R_{thJC}$	Thermal Resistance, Junction to Case (Max)		$1.17$ $^\circ\text{C/W}$

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### ELETRICAL CHARACTERISTICS

TC=25°C unless otherwise noted

Symbol	Ratings	Test Condition(s)	Min	Typ	Max	Unit				
$V_{CEO(BR)}$	Collector-Emitter Breakdown Voltage	$I_C=200\text{ mA}, I_B=0\text{ (*)}$	2N3713	60	-	-	V			
			2N3715							
			2N3714	80	-	-				
			2N3716							
$V_{CEO(SUS)}$	Collector-Emitter Sustaining Voltage (*)	$I_C=200\text{ mA}, I_B=0\text{ (*)}$	2N3713	60	-	-	V			
			2N3715							
			2N3714	80	-	-				
			2N3716							
$I_{CEO}$	Collector-Emitter Current	$V_{CE}=30\text{ V}, I_B=0$	2N3713	-	-	0.7	mA			
			2N3715							
		$V_{CE}=40\text{ V}, I_B=0$	2N3714	-	-	0.7				
			2N3716							
$I_{CEV}$	Collector Cutoff Current	$V_{CE}=80\text{ V}, V_{EB}=-1.5\text{ V}$	2N3713	-	-	1	mA			
			2N3715							
		$V_{CE}=100\text{ V}, V_{EB}=-1.5\text{ V}$	2N3714	-	-	1				
			2N3716							
		$V_{CE}=60\text{ V}, V_{EB}=-1.5\text{ V}$ $T_C = 150^\circ\text{C}$	2N3713	-	-	10				
			2N3715							
		$V_{CE}=80\text{ V}, V_{EB}=-1.5\text{ V}$ $T_C = 150^\circ\text{C}$	2N3714	-	-	10				
			2N3716							
$I_{EBO}$	Emitter Cutoff Current	$V_{BE}=7\text{ V}, I_C=0$	2N3713	-	-	5	mA			
			2N3714							
			2N3715							
			2N3716							
$h_{FE}$	DC Current Gain (*) (**)	$I_C=1\text{ A}, V_{CE}=2\text{ V}$	2N3713	25	-	90	-			
			2N3714							
			2N3715	50	-	150				
								2N3716		
		$I_C=3\text{ A}, V_{CE}=2\text{ V}$	2N3713					15	-	-
			2N3714							
			2N3715	30	-	-				
								2N3716		
		$I_C=10\text{ A}, V_{CE}=4\text{ V}$	2N3713					5	-	-
			2N3714							
			2N3715							
			2N3716							
$V_{CE(SAT)}$	Collector-Emitter saturation Voltage (*) (**)	$I_C=5\text{ A}, I_B=0.5\text{ A}$	2N3713	-	-	1	V			
			2N3714							
			2N3715	-	-	0.8				
			2N3716							

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### ELECTRICAL CHARACTERISTICS

TC=25°C unless otherwise noted

Symbol	Ratings	Test Condition(s)	Min	Typ	Max	Unit	
$V_{BE(SAT)}$	Base-Emitter saturation Voltage (*) (**)	$I_C=5\text{ A}, I_B=0.5\text{ A}$	2N3713	-	-	2	V
			2N3714				
			2N3715	-	-	1.5	
			2N3716				
$V_{BE}$	Base-Emitter Voltage (*) (**)	$I_C=3\text{ A}, V_{CE}=2\text{ V}$	2N3713	-	-	1.5	V
			2N3714				
			2N3715				
			2N3716				
$h_{fe}$	Small Signal Current Gain	$V_{CE}=10\text{ V}, I_C=0.5\text{ A}$ $f=1.0\text{ kHz}$	2N3713	25	-	250	-
			2N3714				
			2N3715				
			2N3716				
		$V_{CE}=10\text{ V}, I_C=0.5\text{ A}$ $f=1.0\text{ MHz}$	2N3713	4	-	4	-
			2N3714				
			2N3715				
			2N3716				

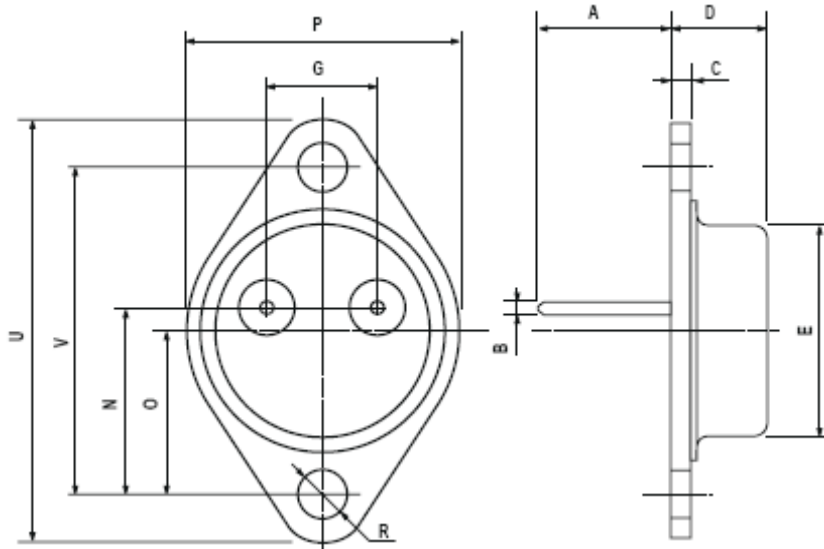
(\*) Pulse Width  $\approx 300\ \mu\text{s}$ , Duty Cycle  $\angle 2.0\%$

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

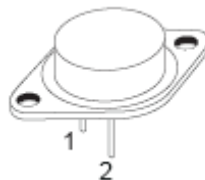
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### MECHANICAL DATA CASE TO-3

DIMENSIONS (mm)		
	min	max
A	11	13.10
B	0.97	1.15
C	1.5	1.65
D	8.32	8.92
F	19	20
G	10.70	11.1
N	16.50	17.20
P	25	26
R	4	4.09
U	38.50	39.30
V	30	30.30



Pin 1 :	Base
Pin 2 :	Emitter
Case :	Collector



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