DIGITRON™ Semiconductors

High-reliability discrete products
and engineering services since 1977

2N3713-2N3716

NPN HIGH POWER SILICON TRANSISTORS

FEATURES

- Available as "HR" (high reliability) screened per MIL-PRF-19500, JANTX level. Add "HR" suffix to base part number.
- Available as non-RoHS (Sn/Pb plating), standard, and as RoHS by adding "-PBF" suffix.

MAXIMUM RATINGS

Ratings	Symbol	2N3713 2N3715	2N3714 2N3716	Units
Collector-Base Voltage	V_{CBO}	80	100	Vdc
Collector-Emitter Voltage	V_{CEO}	60	80	Vdc
Emitter-Base Voltage	V_{EBO}	7.0		Vdc
Collector Current	I_C	10		Adc
Base Current	I_B	4.0		Adc
Total Power Dissipation @ T_A = 25°C **@ T_A = 100°C**	P_T	5.0 85.7		W W
Operating & Storage Junction Temperature Range	T_J, T_{stg}	-65 to +200		°C
THERMAL CHARACTERISTICS				
Characteristics	**Symbol**	**Max.**		**Unit**
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1.17		°C/W

1. Derate linearly 28.57 mW/°C for TA > 25°C
2. Derate linearly 0.857 W/°C for TC > 100°C

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise specified)

Characteristics		Symbol	Min.	Max.	Unit
OFF CHARACTERISTICS					
Collector-Emitter Sustaining Voltage [1] **(I_C = 200 mA, I_B = 0)**	2N3713, 2N3715 2N3714, 2N3716	$V_{(Ceo(sus)}$	60 80		V
Collector-Emitter Cutoff Current **V_{CE} = 80 V, $V_{BE(off)}$ = -1.5 V)** **V_{CE} = 100 V, $V_{BE(off)}$ = -1.5 V)** **V_{CE} = 60 V, $V_{BE(off)}$ = -1.5 V, T_C = 150°C)** **V_{CE} = 80 V, $V_{BE(off)}$ = -1.5 V, T_C = 150°C)**	 2N3713, 2N3715 2N3714, 2N3716 2N3713, 2N3715 2N3714, 2N3716	I_{CEX}		 1.0 1.0	mA
Emitter Cutoff Current **V_{EB} = 7.0 V, I_C = 0)**	All Types	I_{EBO}		5.0	mA
ON-CHARACTERISTICS					
DC Current Gain **I_C = 1.0 A, V_{CE} = 2.0 V** **I_C = 3.0 A, V_{CE} = 2.0 V**	 2N3713, 2N3715 2N3714, 2N3716 2N3713, 2N3715 2N3714, 2N3716	h_{FE}	 25 50 15 30	 90 180	
Collector-Emitter Saturation Voltage **I_C = 5.0 A, I_B = 0.5 A**	2N3713, 2N3715 2N3714, 2N3716	$V_{CE(sat)}$		1.0 0.8	V
Base-Emitter Saturation Voltage **I_C = 5.0 A, I_B = 0.5 A**		$V_{BE(sat)}$		2.0 1.5	V
Base Emitter On Voltage **(I_C = 3.0 A, V_{CE} = 2.0 V)**	All Types	$V_{BE(on)}$		1.5	V

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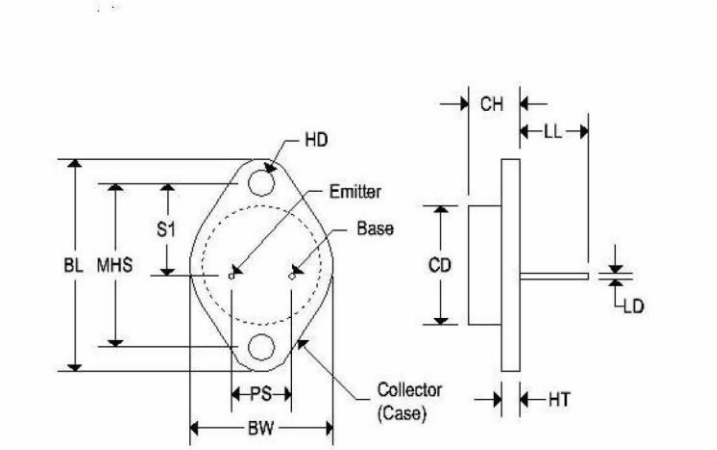
Characteristics	Symbol	Min.	Max.	Unit
DYNAMIC CHARACTERISTICS				
Current Gain Bandwidth Product **I_C = 500 mA, V_{CE} = 10 V, f = 1 MHz)**	f_T	4.0		MHz

1. Pulse Test : Pulse Width = 300 μs, Duty Cycle ≤ 2.0%

MECHANICAL CHARACTERISTICS

Case:	TO-3
Marking:	Alpha-Numeric
Polarity:	See below



	TO-3			
	Inches		Millimeters	
	Min	Max	Min	Max
CD	-	0.875	-	22.220
CH	0.250	0.380	6.860	9.650
HT	0.060	0.135	1.520	3.430
BW	-	1.050	-	26.670
HD	0.131	0.188	3.330	4.780
LD	0.038	0.043	0.970	1.090
LL	0.312	0.500	7.920	12.700
BL	1.550 REF		39.370 REF	
MHS	1.177	1.197	29.900	30.400
PS	0.420	0.440	10.670	11.180
S1	0.655	0.675	16.640	17.150

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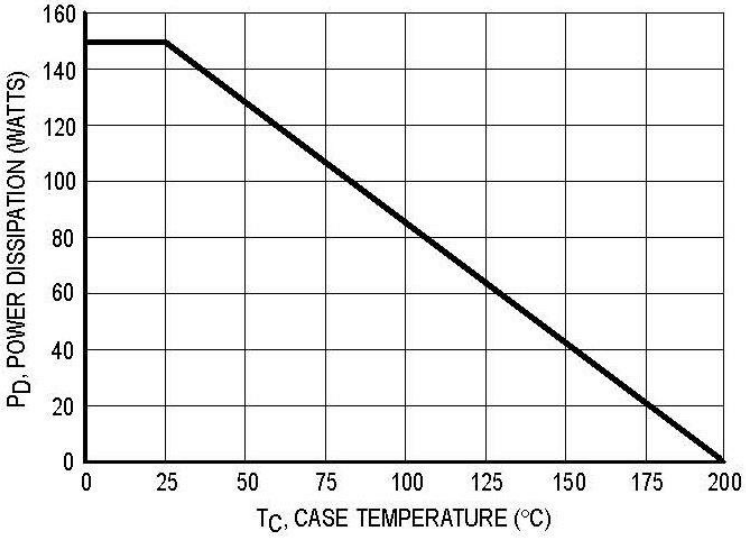
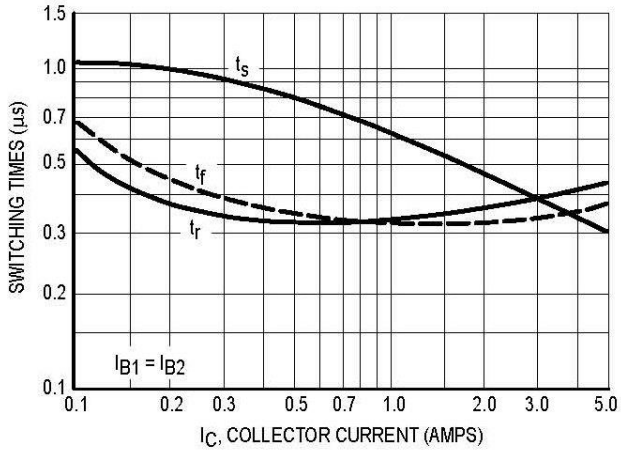


Figure 1. Power–Temperature Derating Curve



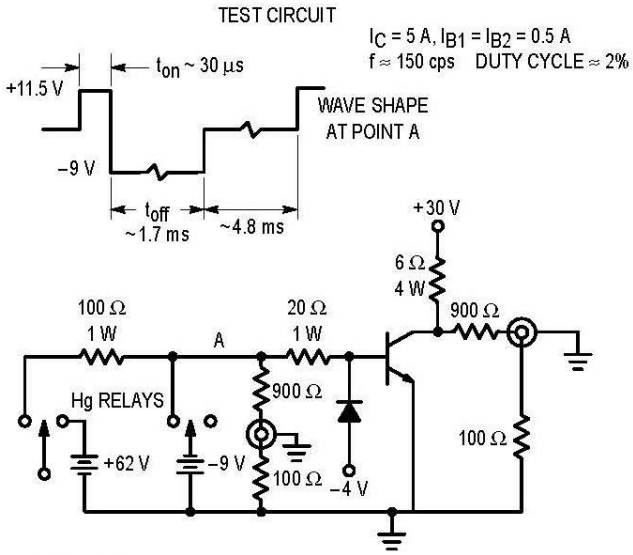


Figure 2. Typical Switching Times

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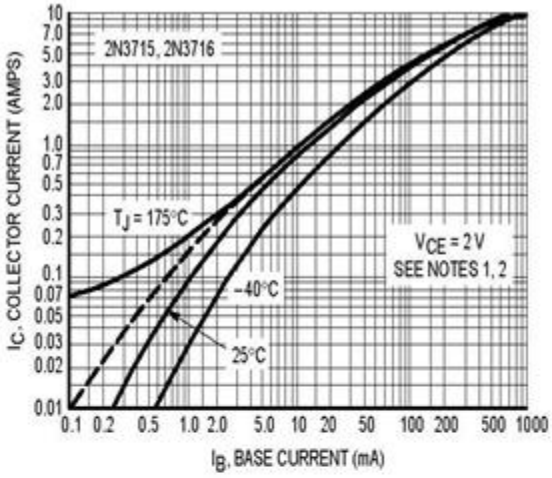

Figure 3. Collector Current versus Base Current

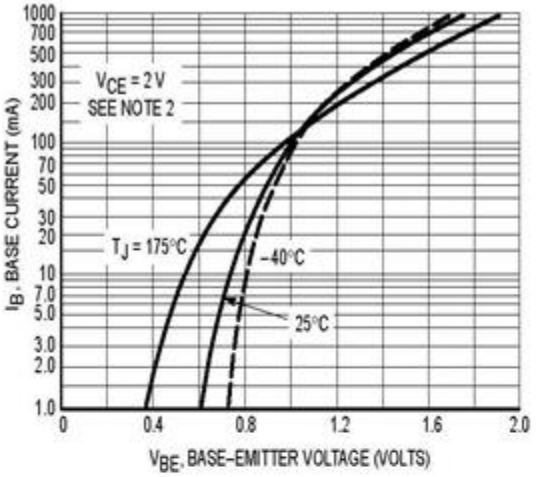

Figure 4. Base Current–Voltage Variations

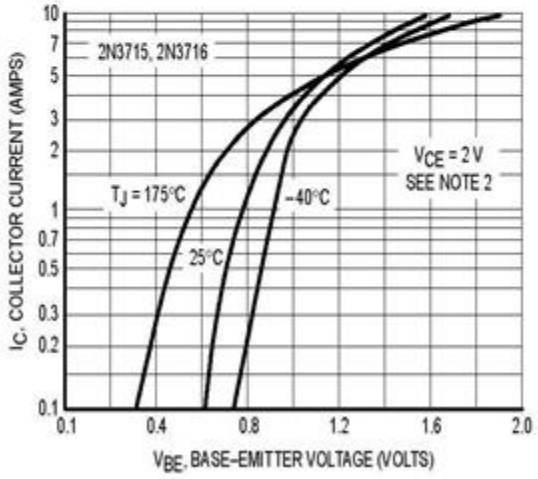

Figure 5. Collector Current–Voltage Variations

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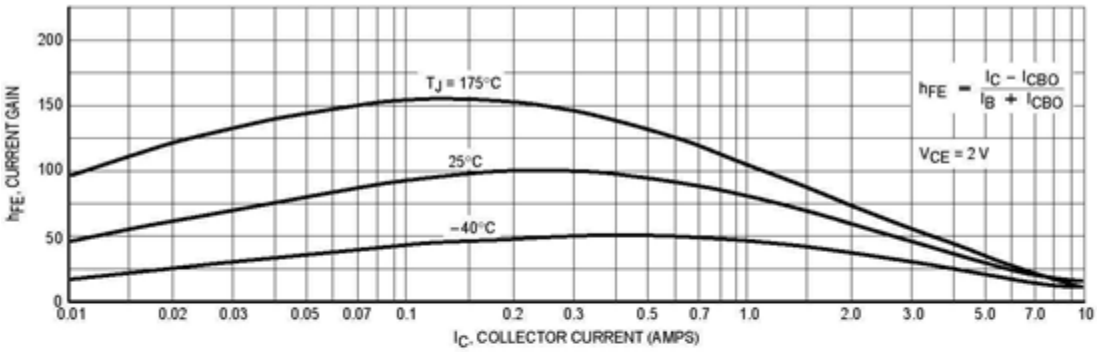

Figure 10. Current Gain Variations

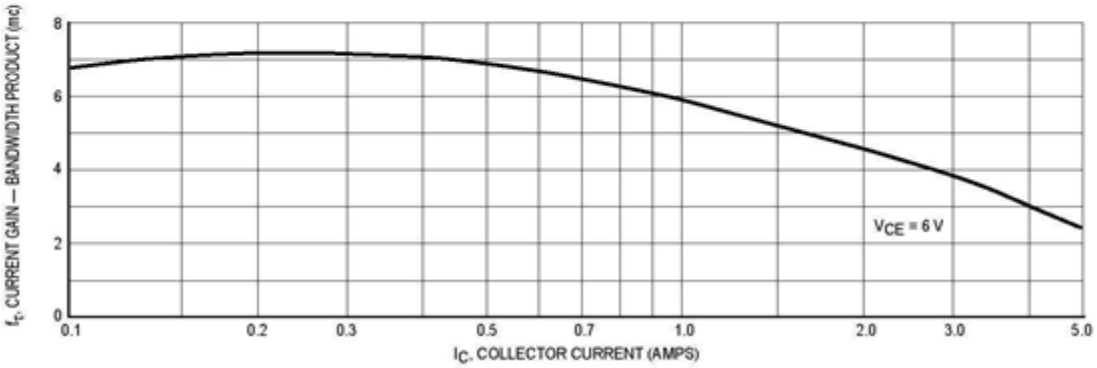

Figure 11. Current Gain — Bandwidth Product versus Collector Current

SAFE OPERATING AREAS

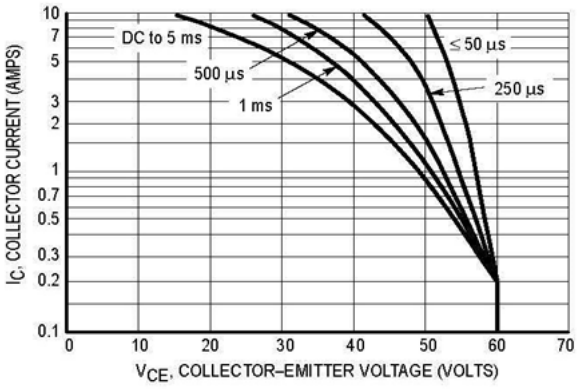

Figure 12. 2N3715

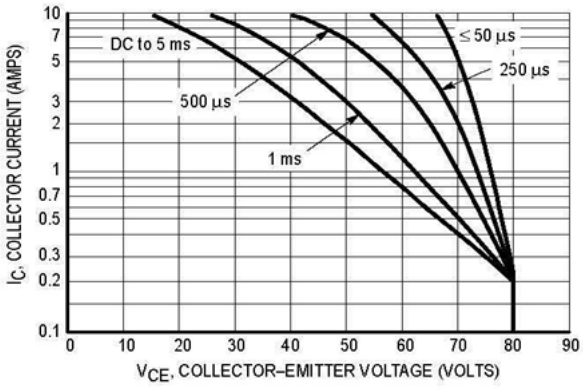

Figure 13. 2N3716