DIGITRON™ Semiconductors

High-reliability discrete products
and engineering services since 1977

2N3700

NPN SILICON LOW POWER 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

Rating	Symbol	2N3700	Units
Collector-Emitter Voltage	V_{CEO}	80	V
Collector-Base Voltage	V_{CBO}	140	V
Emitter-Base Voltage	V_{EBO}	7.0	V
Collector Current	I_C	1.0	A
Total device dissipation T_A = +25°C(1) T_C = +25°(2)	P_D	 0.5 1.0	W
Operating and Storage Temperature Range	T_J, T_{stg}	-65 to +200	°C
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	325	°C/W
Thermal Resistance, Junction to Case	$R_{\theta JC}$	150	°C/W

Note 1: Derate linearly 2.85mW/°C above T_A >+25°C
Note 3: Derate linearly 10.3mW/°C above T_C >+25°C

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

Parameter	Symbol	Min	Max	Unit
Collector-Emitter breakdown voltage I_C = 30mA	$V_{(BR)CEO}$	80	-	V
Collector-Base Cutoff Current V_{CB} = 140V	I_{ces}	-	10	µA
Emitter-Base Cutoff Current V_{EB} = 7.0V	I_{EBO1}	-	10	µA
Emitter-Base Cutoff Current V_{EB} = 5.0V	I_{EBO2}	-	10	µA
Collector-Emitter Cutoff Current V_{CE} = 90V	I_{CES}	-	10	nA
ON CHARACTERISTICS				
Forward Current Transfer Ratio				
I_C = 150mA, V_{CE} = 10V	h_{FE}	100	300	-
I_C = 0.1mA, V_{CE} = 10V		50	300	
I_C = 10mA, V_{CE} = 10V		90	-	
I_C = 500mA, V_{CE} = 10V		50	300	
I_C = 1.0A, V_{CE} = 10V		15	-	
Collector-Emitter Saturation Voltage				
I_C = 150mA, I_B = 15mA	$V_{CE(sat)}$	-	0.2	V
I_C = 500mA, I_B = 50mA		-	0.5	
Base Emitter Saturation Voltage I_C = 150mA, I_B = 15mA	$V_{BE(sat)}$	-	1.1	V

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

Parameter	Symbol	Min	Max	Unit
Small-Signal Forward Current Transfer Ratio I_C = 1.0mA, V_{CE} = 5.0V, f = 1.0kHz	h_{fe}	80	400	-
Magnitude of Small-Signal Forward Current Transfer Ratio I_C = 50mA, V_{CE} = 10V, f = 20MHz	$\|h_{fe}\|$	5.0	20	-
Output Capacitance V_{CB} = 10V, I_E = 0, 100kHz ≤ f ≤ 1.0MHz	C_{obo}	-	12	pF
Output Capacitance V_{EB} = 0.5V, I_C = 0, 100kHz ≤ f ≤ 1.0MHz	C_{ibo}	-	60	pF

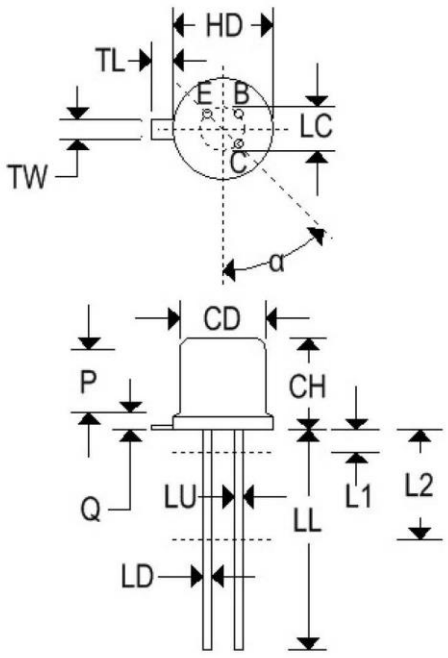
Note 3: PW = 300µs, duty cycle ≤ 2%.

SAFE OPERATION AREA

DC Tests (T_C = 25°C, 1 cycle, t = 10ms)	
Test 1 2N3700	V_{CE} = 10V, I_C = 180mA
Test 2 2N3700	V_{CE} = 40V, I_C = 45mA
Test 3 2N3700	V_{CE} = 80V, I_C = 22.5mA

MECHANICAL CHARACTERISTICS

Case	TO-18
Marking	Alpha-numeric
Pin out	See below



TO-18 (BJT)				
Dim	**Inches**		**Millimeters**	
	Min	**Max**	**Min**	**Max**
CD	0.178	0.195	4.520	4.950
CH	0.170	0.210	4.320	5.330
HD	0.209	0.230	5.310	5.840
LC	0.100 TP		2.540 TP	
LD	0.016	0.021	0.410	0.530
LL	0.500	0.750	12.700	19.050
LU	0.016	0.019	0.410	0.480
L1	-	0.050	-	1.270
L2	0.250	-	6.350	-
P	0.100	-	2.540	-
Q	-	0.040	-	1.020
TL	0.028	0.048	0.710	1.220
TW	0.036	0.046	0.910	1.170
r	-	0.010	-	0.025
α	45°TP		45°TP	

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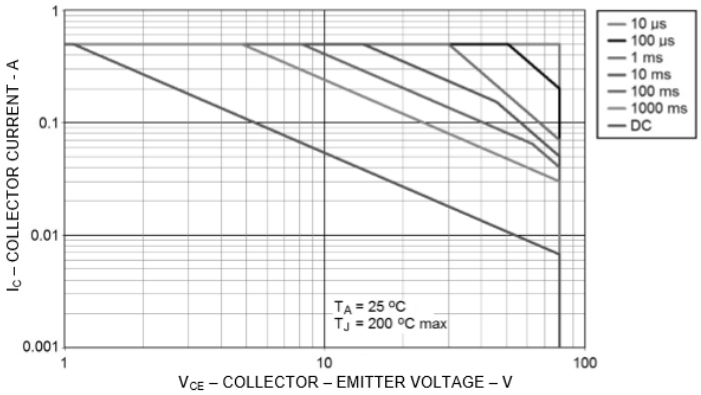
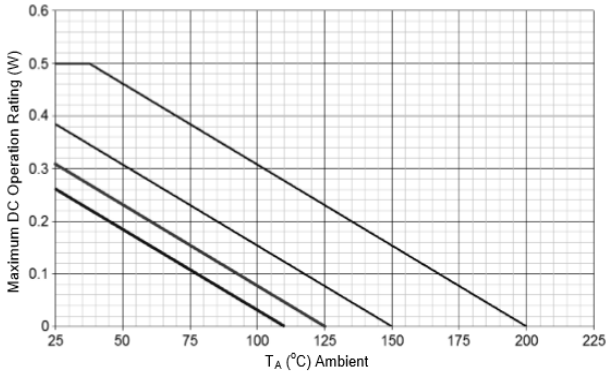


Maximum Safe Operating Area @ T_A = 25 °C



Temperature-Power Derating ($R_{\theta JA}$)
Leads = 0.125 inch (3.175mm)

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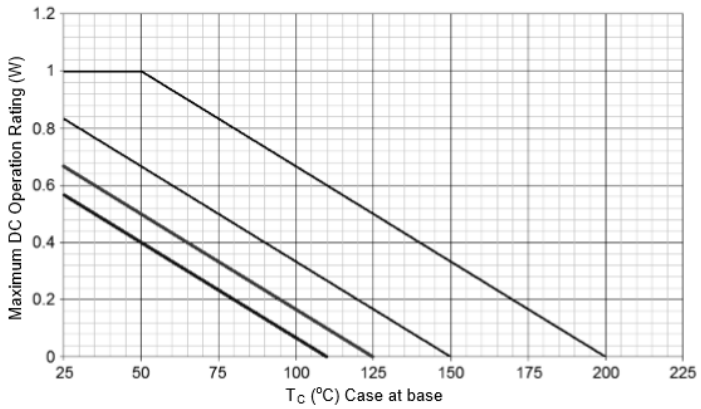

Temperature-Power Derating ($R_{\theta JC}$)