2N3485A, 2N3486A

PNP Silicon Switching Transistor

Rev. V2

Features

- Available in JAN, JANTX and JANTXV per MIL-PRF-19500/392
- TO-46 Package
- Designed for Power Amplifier and Medium Speed Switching Applications

Electrical Characteristics (T_A = +25°C unless otherwise specified)

Parameter	Test Conditions	Symbol	Units	Min.	Max.
Collector - Emitter Breakdown Voltage	I_C = -10 mA dc	$V_{(BR)CEO}$	V dc	-60	—
Collector - Base Cutoff Current	V_{CB} = -60 V dc	I_{CBO1}	μA dc	—	-10
Emitter - Base Cutoff Current	V_{EB} = -5 V dc	I_{EBO1}	μA dc	—	-10
Collector - Base Cutoff Current	V_{CB} = -50 V dc	I_{CBO2}	nA dc	—	-10
Emitter - Base Cutoff Current	V_{EB} = -3.5 V dc	I_{EBO2}	nA dc	—	-50
Base - Emitter Voltage (saturated)	I_C = -150 mA dc; I_B = -15 mA dc I_C = -500 mA dc; I_B = -50 mA dc	$V_{BE(sat)1}$ $V_{BE(sat)2}$	V dc	—	-1.3 -2.6
Collector-Emitter Voltage (saturated)	I_C = -150 mA dc; I_B = -15 mA dc I_C = -500 mA dc; I_B = -50 mA dc	$V_{CE(sat)1}$ $V_{CE(sat)2}$	V dc	—	-0.4 -1.6
Forward Current Transfer Ratio	V_{CE} = -10 V dc; I_C = -0.1 mA dc 2N3485A 2N3486A	h_{FE1}	-	 40 75	
	V_{CE} = -10 V dc; I_C = -1.0 mA dc 2N3485A 2N3486A	h_{FE2}		 40 100	
	V_{CE} = -10 V dc; I_C = -10 mA dc 2N3485A 2N3486A	h_{FE3}		 40 100	
	V_{CE} = -10 V dc; I_C = -150 mA dc 2N3485A 2N3486A	h_{FE4}		 40 100	 120 300
	V_{CE} = -10 V dc; I_C = -500 mA dc 2N3485A 2N3486A	h_{FE5}		 40 50	

Electrical Characteristics (T_A = +25°C unless otherwise specified)

Parameter	Test Conditions	Symbol	Units	Min.	Max.
Collector - Emitter Cutoff Current	T_A = +150°C V_{CB} = -50 V dc	I_{CBO3}	µA dc	—	-10
Forward - Current Transfer Ratio	T_A = -55°C V_{CE} = -10 V dc; I_C = -1.0 mA dc 2N3485A 2N3486A	h_{FE6}		20 40	
Dynamic Characteristics					
Small Signal Short Circuit Forward-Current Transfer Ratio	V_{CE} = -10 V dc; I_C = -1 mA dc; f = 1 kHz 2N3485A 2N3486A	h_{fe}		40 100	
Open Circuit Output Capacitance	V_{CB} = -10 V dc; I_E = -0; 100 kHz ≤ f ≤ 1 MHz	C_{obo}	pF	—	8
Magnitude of Small-Signal Short-Circuit Forward Current Transfer Ratio	V_{CE} = -20 V dc; I_C = -50 mA dc; f = 100 MHz	$\|h_{fe}\|$	-	2.0	10
Input Capacitance (Output Open-Circuited)	V_{EB} = -2.0 V dc; I_C = -0; 100 kHz ≤ f ≤ 1 MHz	C_{ibo}	pF	—	30

Parameter	Test Conditions	Symbol	Units	Min.	Max.
Turn-On Time	See Figure 6 of MIL-PRF-19500/392	t_{on}	ns	—	45
Turn-Off Time	See Figure 7 of MIL-PRF-19500/392 2N3485A 2N3486A	t_{off}	ns	—	175 200
Pulse Response (non-saturated)	See Figure 8 of MIL-PRF-19500/392	$t_{on} + t_{off}$	ns	—	18

For further information and support please visit:
info@vptcomponents.com

Absolute Maximum Ratings (T_A = +25°C unless otherwise specified)

Ratings	Symbol	Value
Collector - Emitter Voltage	V_{CEO}	-60 V dc
Collector - Base Voltage	V_{CBO}	-60 V dc
Emitter - Base Voltage	V_{EBO}	-5 V dc
Collector Current	I_C	-600 mA dc
Total Power Dissipation T_A = +25°C T_C = +25°C	P_T (1) (2)	 0.5 W 2.0 W
Operating & Storage Temperature Range	T_J, T_{STG}	-65°C to +200°C

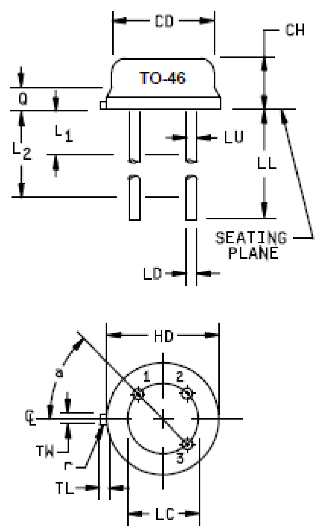
Thermal Characteristics

Characteristics	Symbol	Max. Value
Thermal Resistance, Junction to Case	$R_{\theta JC}$	80°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	325°C/W

1. For derate see figure 2 and figure 3 of MIL-PRF-19500/392
2. For thermal impedance see figure 4 and figure 5 of MIL-PRF-19500/392

Outline Drawing (TO-46)

Symbol	Dimensions				Note
	Inches		Millimeters		
	Min	Max	Min	Max	
CD	.178	.195	4.52	4.95	
CH	.065	.085	1.65	2.16	
HD	.209	.230	5.31	5.84	
LC	.100 TP		2.54 TP		5
LD	.016	.021	0.41	0.53	
LL	.500	1.750	12.70	44.45	6
LU	.016	.019	0.41	0.48	6
L_1		.050		1.27	6
L_2	.250		6.35		6
Q		.040		1.02	3
TL	.028	.048	0.71	1.22	8
TW	.036	.046	0.91	1.17	4
r		.010		0.25	9
α	45° TP		45° TP		5

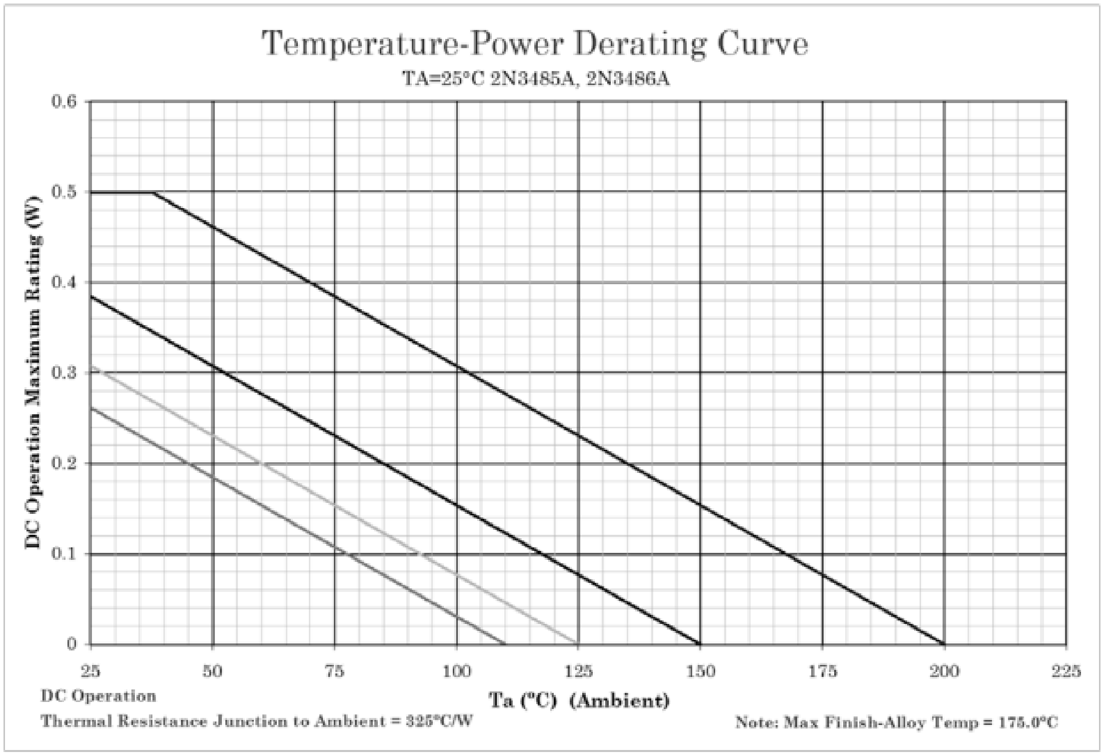


NOTES:

1. Dimensions are in inches. Lead 1 is emitter, lead 2 is base, and lead 3 is collector.
2. Millimeters are given for general information only.
3. Symbol TL is measured from HD maximum.
4. Details of outline in this zone are optional.
5. Leads at gauge plane .054 inch (1.37 mm) +.001 inch (0.03 mm) -.000 inch (0.00 mm) below seating plane shall be within .007 inch (0.18 mm) radius of TP relative to tab. Device may be measured by direct methods or by gauge.
6. Symbol LU applies between L_1 and L_2. Dimension LD applies between L_2 and LL minimum.
7. Lead number three is electrically connected to case.
8. Beyond r maximum, TW shall be held for a minimum length of .011 inch (0.28 mm).
9. Symbol r applied to both inside corners of tab.
10. In accordance with ANSI Y14.5M, diameters are equivalent to ϕx symbology.

FIGURE 1. Physical dimensions – TO-46.

Temperature-Power Derating Curve

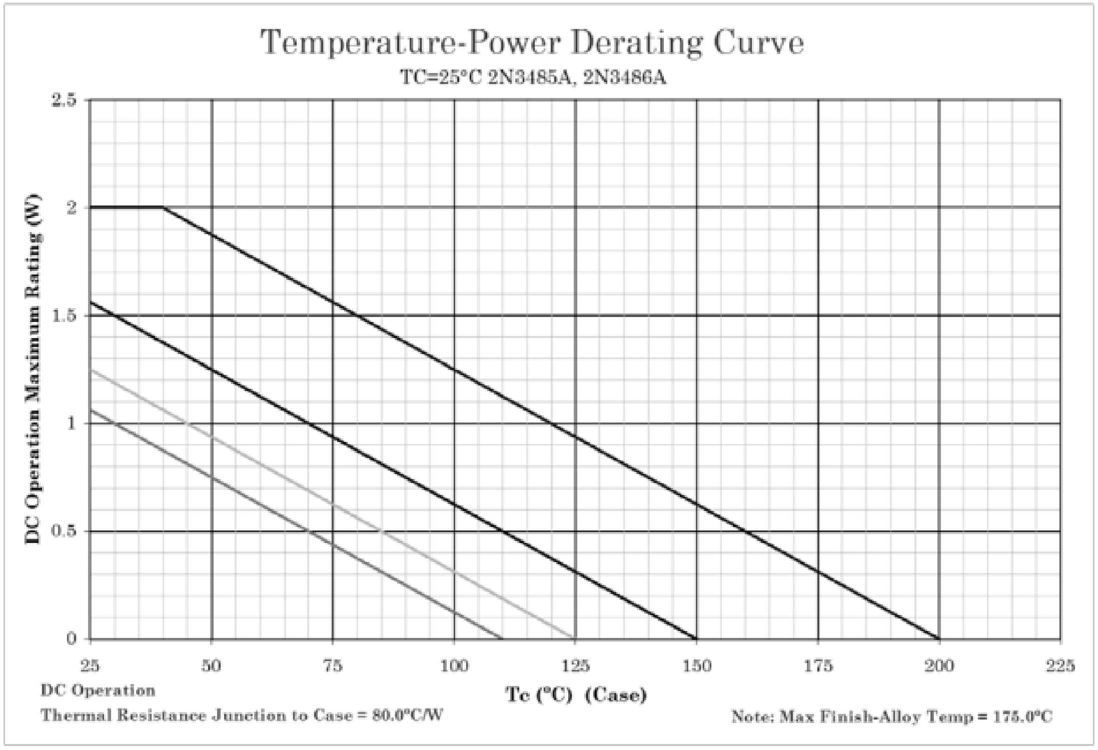


NOTES:

1. This is the true inverse of the worst case thermal resistance value. All devices are capable of operating at ≤ T_J specified on this curve. Any parallel line to this curve will intersect the appropriate power for the desired maximum T_J allowed.
2. Derate design curve constrained by the maximum junction temperature (T_J ≤ 200°C) and power rating specified. (See 1.3 herein.)
3. Derate design curve chosen at T_J ≤ 150°C, where the maximum temperature of electrical test is performed.
4. Derate design curves chosen at T_J ≤, 125°C, and 110°C to show power rating where most users want to limit T_J in their application.

FIGURE 2. Derating for 2N3485A, and 2N3486A ($R_{\theta JA}$) (TO-46).

Temperature-Power Derating Curve

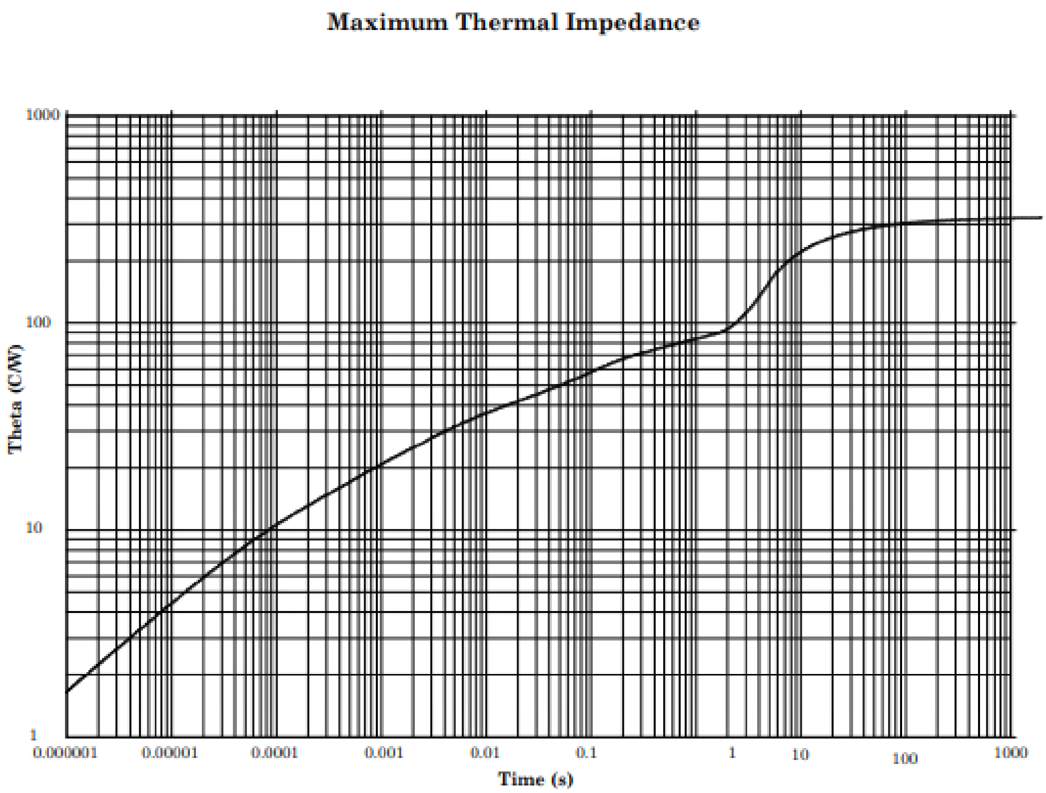


NOTES:

1. This is the true inverse of the worst case thermal resistance value. All devices are capable of operating at $\leq T_J$ specified on this curve. Any parallel line to this curve will intersect the appropriate power for the desired maximum T_J allowed.
2. Derate design curve constrained by the maximum junction temperature ($T_J \leq 200°C$) and power rating specified. (See 1.3 herein.)
3. Derate design curve chosen at $T_J \leq 150°C$, where the maximum temperature of electrical test is performed.
4. Derate design curves chosen at $T_J \leq$, 125°C, and 110°C to show power rating where most users want to limit T_J in their application.

FIGURE 3. Derating for 2N3485A, and 2N3486A ($R_{\theta JC}$) (TO-46).

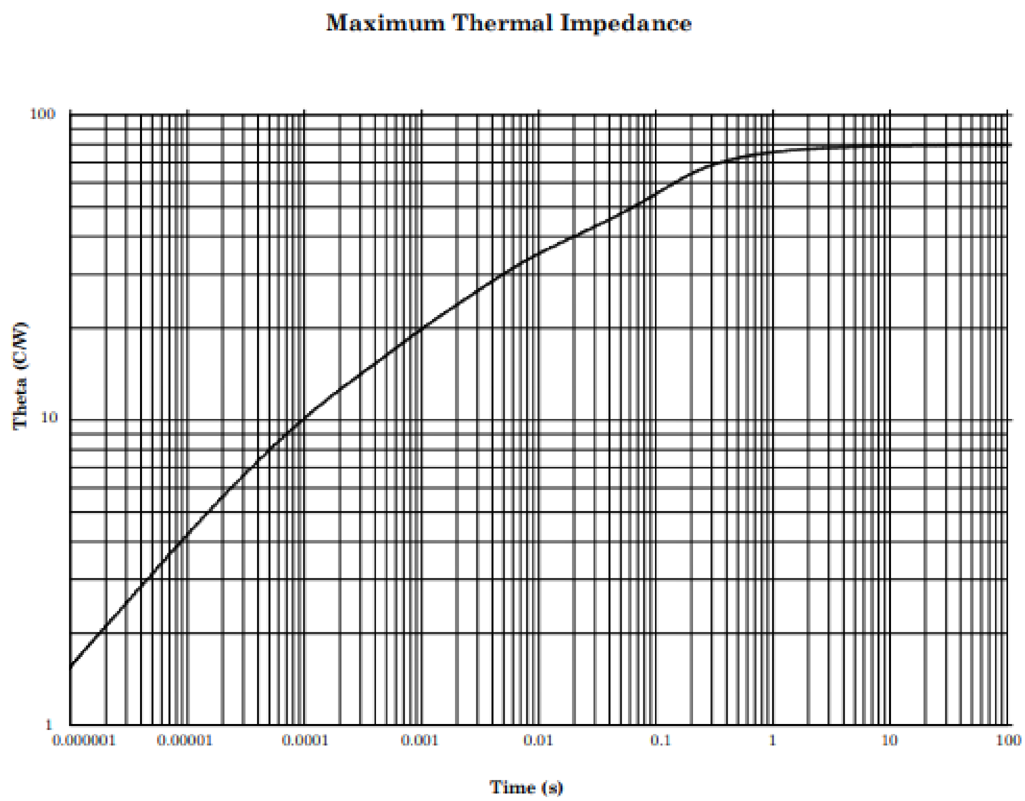
Thermal Impedance Curve



T_A = +25°C at Pdiss = 500mW (Thermal Resistance $R_{\theta JA}$ = 325°C/W at 500mW)

FIGURE 4. Thermal impedance graph ($R_{\theta JA}$) for 2N3485A, and 2N3486A (TO-46).

Thermal Impedance Curve



Tc = +25°C. thermal resistance $R_{\theta JC}$ = 80C/W at Tc +25°C.

FIGURE 5. Thermal impedance graph ($R_{\theta JC}$) for 2N3485A, and 2N3486A (TO-46).