

POWER TRANSISTORS

5 Amp, 80V, Planar, NPN

JAN, JANTX, & JANTXV 2N2880
 JAN, JANTX, & JANTXV 2N3749

FEATURES

- Meets MIL-S-19500/315
- Collector-Base Voltage: 110V
- Fast Switching: t_r , t_f = 300nSec max
- Low Saturation Voltage: 0.25V max @ 1A

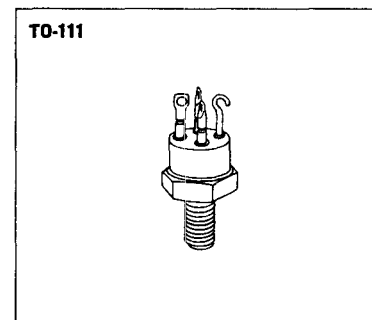
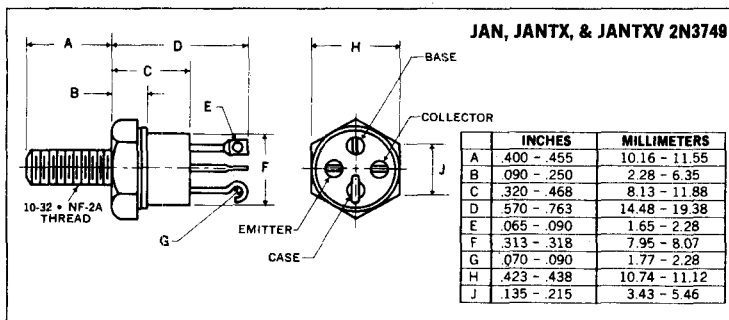
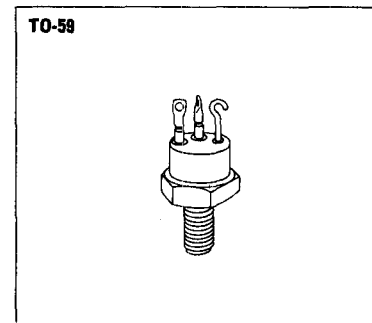
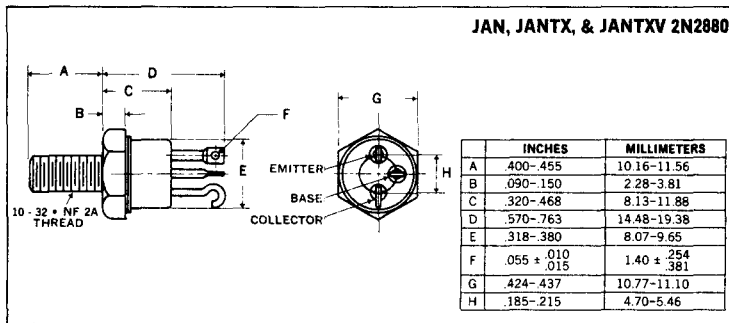
DESCRIPTION

Unitrode power transistors provide a unique combination of low saturation voltage, high gain and fast switching. They are ideally suited for power supply, pulse amplifier and similar high efficiency power switching applications.

ABSOLUTE MAXIMUM RATINGS

Collector-Base Voltage, V_{CBO}	110V
Collector-Emitter Voltage, V_{CEO}	80V
Emitter-Base Voltage, V_{EBO}	8V
D.C. Collector Current, I_C	5A
Power Dissipation	
25°C Ambient	.2W
100°C Case	.30W
Operating and Storage Temperature Range	-65°C to +200°C

MECHANICAL SPECIFICATIONS

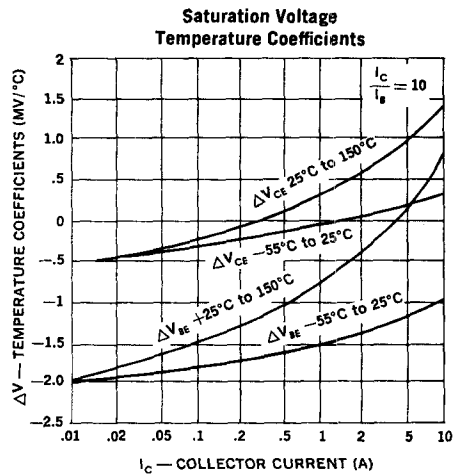
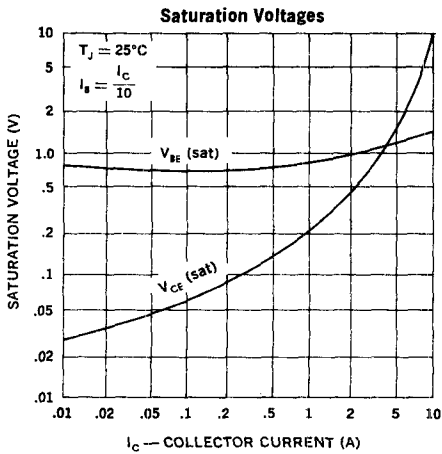
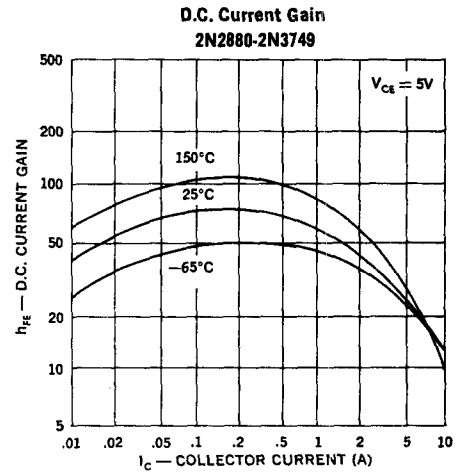
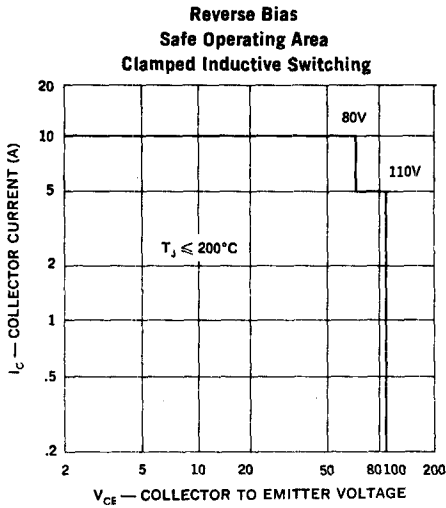
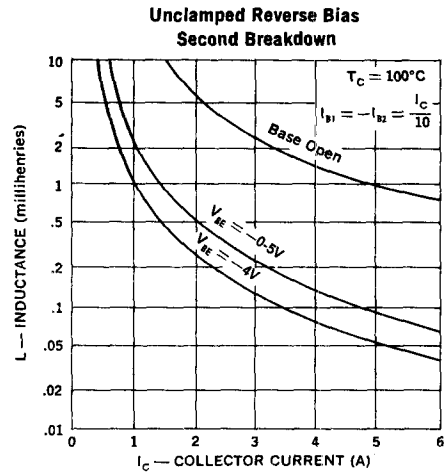
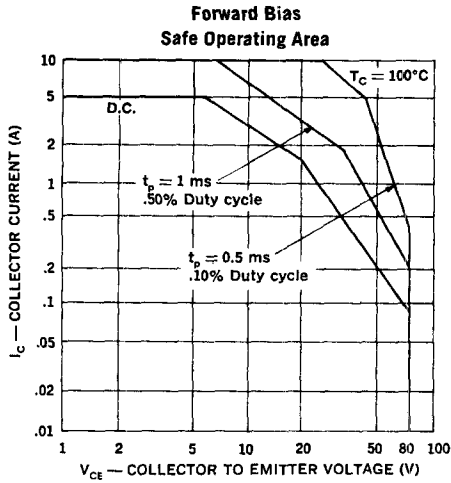


ELECTRICAL SPECIFICATIONS (at 25°C unless noted)

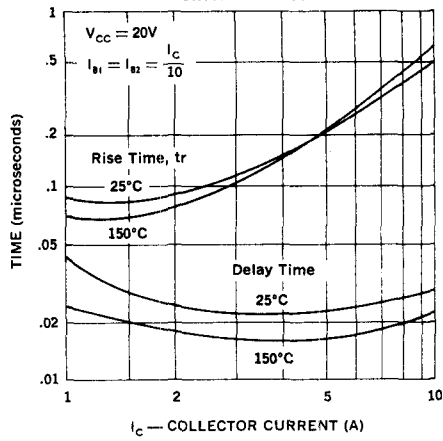
TEST	SYMBOL	MIN.	MAX.	UNITS	/315 Sub group	MIL - STD - 750	
						METHOD	TEST CONDITIONS
Visual and Mechanical	—	—	—	—	A-1	2071	See Mechanical Data
Collector-Base Voltage	V_{CB0}	110	—	Vdc	A-2	3001	$I_C = 10\mu\text{Adc}$, Cond. D $I_C = 0.1\text{Adc}$, Cond. D $I_E = 10\mu\text{Adc}$, Cond. D $V_{CE} = 60\text{Vdc}$, Cond. D $V_{CE} = 110\text{Vdc}$, $V_{EB} = 0.5\text{Vdc}$, Cond. A $V_{CB} = 80\text{Vdc}$, Cond. D $V_{EB} = 6\text{Vdc}$, Cond. D
Collector-Emitter Voltage (1.)	V_{CEO}	80	—	Vdc	A-2	3011	
Emitter-Base Voltage	V_{EBO}	8	—	Vdc	A-2	3026	
Collector-Emmitter Cutoff Current	I_{CE0}	—	100	μAdc	A-2	3041	
Collector-Emmitter Cutoff Current	I_{CEX}	—	10	μAdc	A-2	3041	
Collector-Base Cutoff Current	I_{CBO}	—	0.4	μAdc	A-2	3036	
Emitter-Base Cutoff Current	I_{EBO}	—	0.4	μAdc	A-2	3061	
D.C. Current Gain (1.)	h_{FE}	40	—	—	A-3	3076	$I_C = 50\text{mAdc}$, $V_{CE} = 5\text{Vdc}$ $I_C = 1\text{Adc}$, $V_{CE} = 5\text{Vdc}$ $I_C = 5\text{Adc}$, $V_{CE} = 5\text{Vdc}$ $I_C = 1\text{Adc}$, $I_B = 0.1\text{Adc}$ $I_C = 5\text{Adc}$, $I_B = 0.5\text{Adc}$ $I_C = 1\text{Adc}$, $I_B = 0.1\text{Adc}$ $I_C = 1\text{Adc}$, $V_{CE} = 2\text{Vdc}$
D.C. Current Gain (1.)	h_{FE}	40	120	—	A-3	3076	
D.C. Current Gain (1.)	h_{FE}	15	—	—	A-3	3076	
Collector Saturation Voltage (1.)	$V_{CE(sat)}$	—	0.25	Vdc	A-3	3071	
Collector Saturation Voltage (1.)	$V_{CE(sat)}$	—	2	Vdc	A-3	3071	
Base Saturation Voltage (1.)	$V_{BE(sat)}$	—	1.2	Vdc	A-3	3066	
Base On-Voltage (1.)	$V_{BE(on)}$	—	1.2	Vdc	A-3	3066	
A.C. Current Gain	h_{FE}	40	120	—	A-4	3206	$I_C = 50\text{mAdc}$, $V_{CE} = 5\text{Vdc}$, $f = 1\text{KHz}$ $I_C = 1\text{Adc}$, $V_{CE} = 10\text{Vdc}$, $f = 10\text{MHz}$ $V_{CB} = 10\text{Vdc}$, $I_E = 0$, $f = 1\text{MHz}$ } See Switching Speed Circuit
Gain-Bandwidth Product	f_T	20	120	MHz	A-4	3306	
Output Capacitance	C_{ob}	—	150	pf	A-4	3236	
Switching Parameters							
Delay Time	t_d	—	60	ns	A-4	—	
Rise Time	t_r	—	300	ns	A-4	—	
Storage Time	t_s	—	1.7	μs	A-4	—	
Fall Time	t_f	—	300	ns	A-4	—	
Thermal Resistance	θ_{JC}	—	3.33	°C/W	C-1	3151	
100°C Forward-Biased Second Breakdown	$I_{S/B}$	5	—	Adc	B-5	3051	$V_{CE} = 6\text{Vdc}$, $t = 60\text{Sec}$, $T_C = 100^\circ\text{C}$ $V_{CE} = 80\text{Vdc}$, $t = 60\text{Sec}$, $T_C = 100^\circ\text{C}$ $I_C = 5\text{A}$, $L = 1\text{mH}$, $V_{Clamp} = 110\text{V}$, $T_C = 100^\circ\text{C}$
Forward-Biased Second Breakdown	$I_{S/B}$	80	—	mAdc	B-5	3051	
Clamped Reverse-Biased Second Breakdown	$E_{S/B}$	12.5	—	mj	B-7	—	
Unclamped Revers -Biased Second Breakdown	$E_{S/B}$	12.5	—	mj	B-6	3053	$I_C = 5\text{A}$, $L = 1\text{mH}$ Base Open $I_C = 1.6\text{A}$, $L = 10\text{mH}$ Base Open
Unclamped Reverse-Biased Second Breakdown	$E_{S/B}$	12.8	—	mj	B-6	3053	
150°C Collector-Emmitter Cutoff Current	I_{CEX}	—	50	μA	A-5	3041	$V_{CE} = 80\text{Vdc}$, $V_{EB} = 0.5\text{Vdc}$ Cond. A, $T_A = 150^\circ\text{C}$
-65°C D.C. Current Gain (1.)	h_{FE}	15	—	—	A-5	3076	$I_C = 1\text{Adc}$, $V_{CE} = 5\text{Vdc}$ $T_A = -65^\circ\text{C}$

Note 1. Pulse Width = 300 μSec , duty cycle $\leq 2\%$

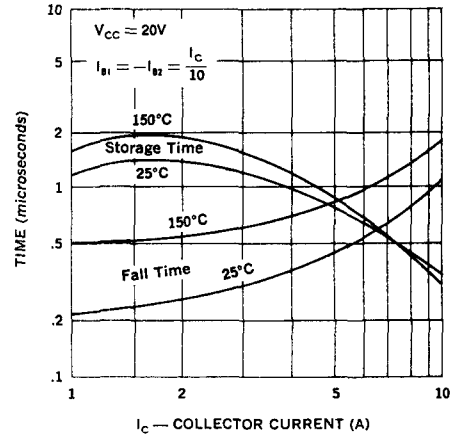
IV



Switching Speed Characteristics

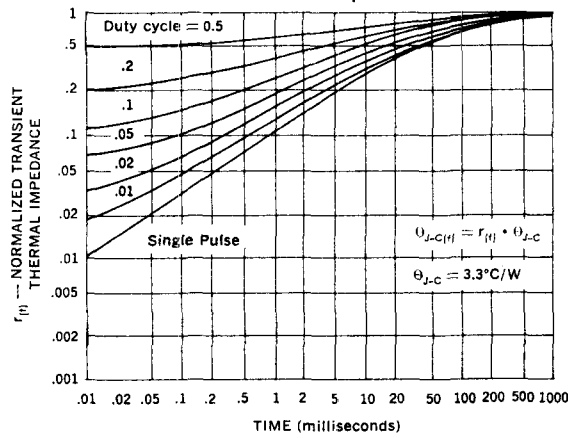


Switching Speed Characteristics

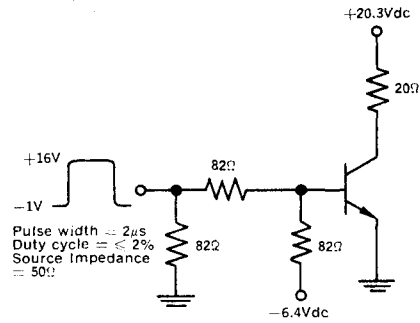


IV

Thermal Response



Switching Speed Circuit



NOTES:

1. $I_C \approx 1A$, $I_{B1} \approx -I_{B2} \approx 100mA$
2. The values of collector current and base current are nominal. The actual values will vary slightly with transistor parameters.