DIGITRON™ Semiconductors

High-reliability discrete products
and engineering services since 1977

2N489(A,B)-2N494(A,B)

SILICON UNIJUNCTION 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.
- Stable operation over wide temperature range
- Low leakage current
- Low peak point current
- Guaranteed minimum pulse voltage

MAXIMUM RATINGS

Rating	Value
Total RMS Power Dissipation (Unstabilized)	450mW
Total RMS Power Dissipation (Stabilized)	600mW
RMS Emitter Current	70mA
Peak Emitter Current (T_J = 150°C)	2 A
Emitter Reverse Voltage (T_J = 150°C)	60 V
Operating Temperature Range	-65° to +140°C
Operating Temperature Range (Stabilized)	-65° to +175°C
Storage Temperature Range	-65° to +175°C

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

Part number	Intrinsic standoff ratio (1)		Interbase resistance (2)		Modulated interbase current		Maximum					Minimum	
							Emitter saturation voltage	Emitter reverse current			Peak point current	Valley point current	Base one peak pulse voltage (3)
	V_{RR} = 10V		V_{BB} = 3V		I_R = 50mA V_{BB} = 10V		I_E = 50mA V_{BB} = 10V	V_{B2E} = 60V	T_J = 150°C V_{B2E} = 10V	V_{B2E} =30V	V_{BB} = 25V	R_{B2} = 100Ω V_{BB} = 20V	
			R_{BBO}		$I_{B2(MOI)}$		$V_{E(SAT)}$	I_{EB2O}	I_{EB2O}	I_{EB2O}	I_P	I_V	V_{OB1}
	η		kΩ		mA		Volts	µA	µA	µA	µA	mA	Volts
	Min	Max	Min	Max	Min	Max							
2N489	.51	.62	4.7	6.8	6.8	22	5	2	20	-	12	8	-
2N489A	.51	.62	4.7	6.8	6.8	22	4	2	20	-	12	8	3
2N489B	.51	.62	4.7	6.8	6.8	22	4	2	20	0.2	6	8	3
2N490	.51	.62	6.2	9.1	6.8	22	5	2	20	-	12	8	-
2N490A	.51	.62	6.2	9.1	6.8	22	4	2	20	-	12	8	3
2N490B	.51	.62	6.2	9.1	6.8	22	4	2	20	0.2	6	8	3
2N490C	.51	.62	6.2	9.1	6.8	22	4	2	20	0.02	2	8	3
2N491	.56	.68	4.7	6.8	6.8	22	5	2	20	-	12	8	-
2N491A	.56	.68	4.7	6.8	6.8	22	4.3	2	20	-	12	8	3
2N491B	.56	.68	4.7	6.8	6.8	22	4.3	2	20	0.2	6	8	3
2N492	.56	.68	6.2	9.1	6.8	22	5	2	20	-	12	8	-
2N492A	.56	.68	6.2	9.1	6.8	22	4.3	2	20	-	12	8	3
2N492B	.56	.68	6.2	9.1	6.8	22	4.3	2	20	0.2	6	8	3

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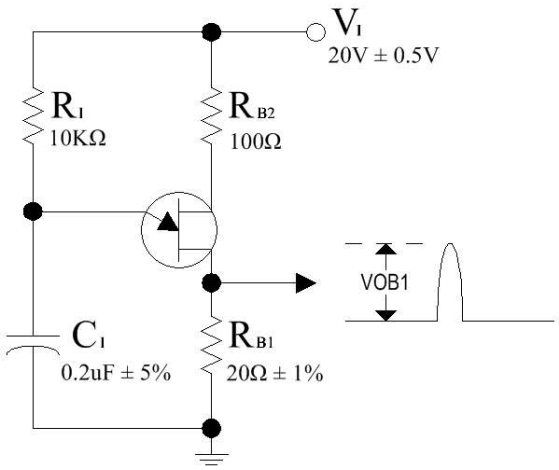
ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise specified)

Part number	Intrinsic standoff ratio (1)		Interbase resistance (2)		Modulated interbase current		Maximum					Minimum	
							Emitter saturation voltage	Emitter reverse current			Peak point current	Valley point current	Base one peak pulse voltage (3)
	V_{RR} = 10V		V_{BB} = 3V		I_R = 50mA V_{BB} = 10V		I_E = 50mA V_{BB} = 10V	V_{B2E} = 60V	T_J = 150°C V_{B2E} = 10V	V_{B2E} =30V	V_{BB} = 25V	R_{B2} = 100Ω V_{BB} = 20V	
			R_{BBO}		$I_{B2(MOI)}$		$V_{E(SAT)}$	I_{EB2O}	I_{EB2O}	I_{EB2O}	I_P	I_V	V_{OB1}
	η		kΩ		mA		Volts	µA	µA	µA	µA	mA	Volts
	Min	Max	Min	Max	Min	Max							
2N492C	.56	.68	6.2	9.1	6.8	22	4.3	2	20	0.02	2	8	3
2N493	.62	.75	4.7	6.8	6.8	22	5	2	20	-	12	8	-
2N493A	.62	.75	4.7	6.8	6.8	22	4.6	2	20	-	12	8	3
2N493B	.62	.75	4.7	6.8	6.8	22	4.6	2	20	0.2	6	8	3
2N494	.62	.75	6.2	9.1	6.8	22	5	2	20	-	12	8	-
2N494A	.62	.75	6.2	9.1	6.8	22	4.6	2	20	-	12	8	3
2N494B	.62	.75	6.2	9.1	6.8	22	4.6	2	20	0.2	6	8	3
2N494C	.62	.75	6.2	9.1	6.8	22	4.6	2	20	0.02	2	8	3

Note 1: The intrinsic standoff ratio, η, is essentially constant with temperature and interbase voltage. η is defined by the equation: $V_P = \eta V_{BB} + 200/T_J$, where V_P = peak point emitter voltage, V_{BB} = Interbase voltage, T_J = Junction temperature (Degrees Kelvin).

Note 2: The interbase resistance is nearly ohmic and increases with temperature in a well defined manner. The temperature coefficient at 25°C is approximately 0.8%/°C.

Note 3: The base-one peak pulse voltage is measured in the circuit below. This specification on the A and B versions is used to ensure a minimum pulse amplitude for applications in SCR firing circuits and other types of pulse circuits.



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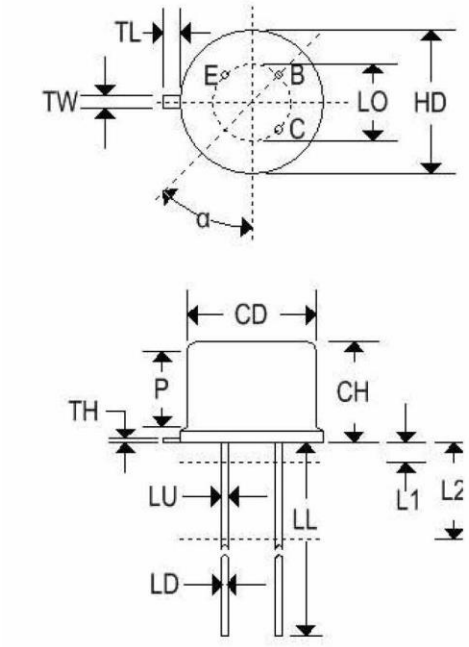
MECHANICAL CHARACTERISTICS

Case	TO-5
Marking	Alpha-numeric
Polarity	See below



Dim	TO-5			
	Inches		Millimeters	
	Min	Max	Min	Max
HD	0.335	0.370	8.510	9.400
CD	0.305	0.335	7.750	8.510
CH	0.240	0.260	6.100	6.600
LL	1.500	-	38.100	-
LD	0.016	0.021	0.410	0.530
LU	0.016	0.019	0.410	0.480
P	0.100	-	2.540	-
TL	0.029	0.045	0.740	1.140
TW	0.028	0.034	0.710	0.860
TH	0.009	0.125	0.230	3.180
LO	0.141 NOM		3.590 NOM	
α	45°TP		45°TP	

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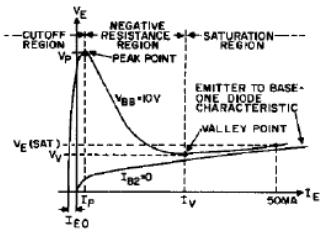
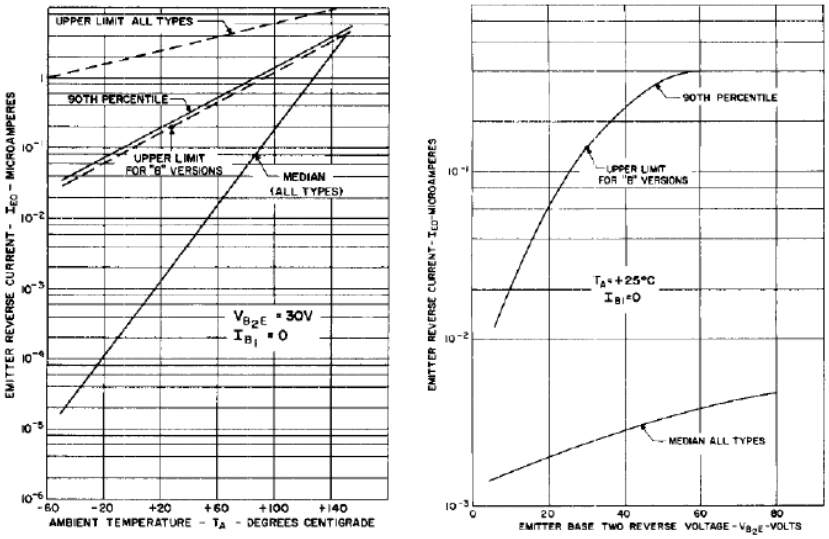
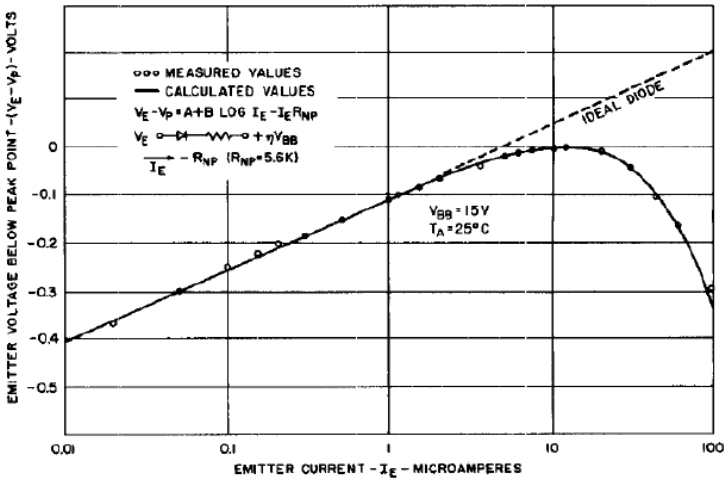


Static emitter characteristic curves showing important parameters and measurement points.



Emitter reverse current characteristics



Static emitter characteristics at peak point

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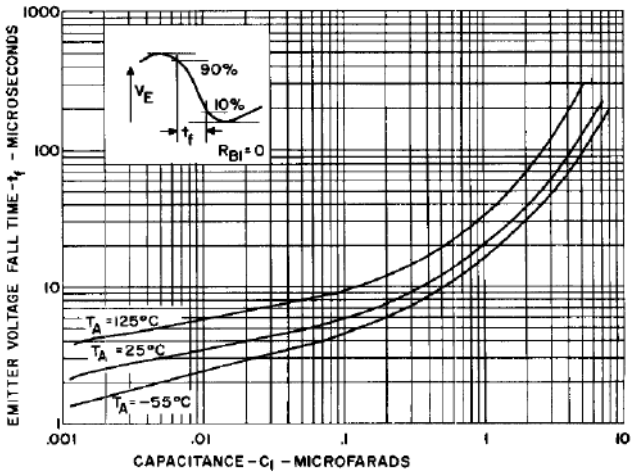
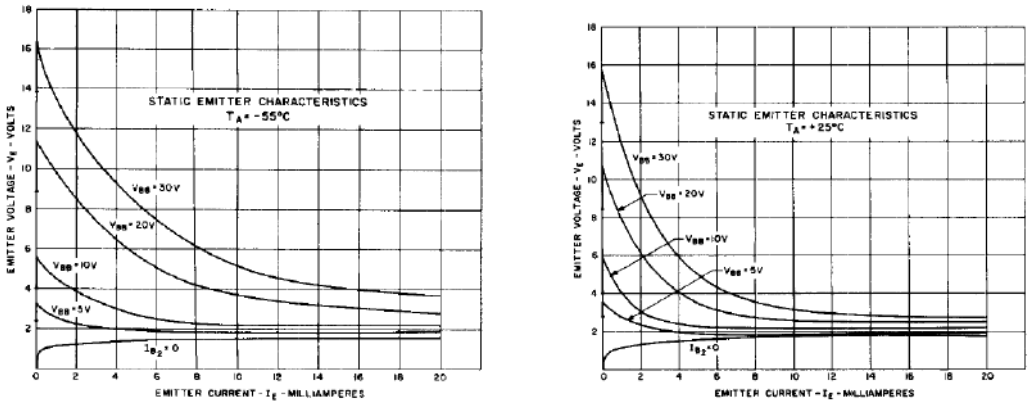
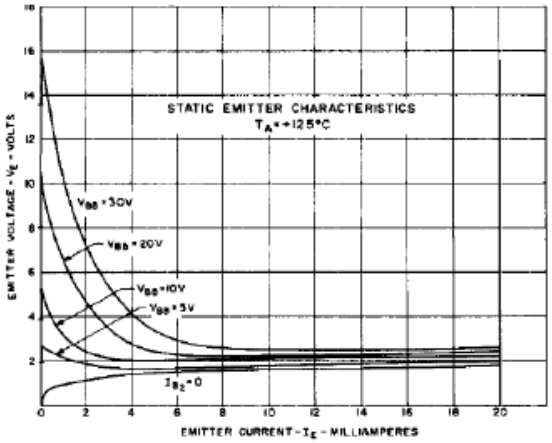


Emitter voltage fall time vs. capacitance in relaxation oscillator



Static emitter characteristics



Static emitter characteristics

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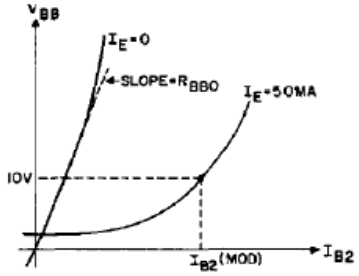
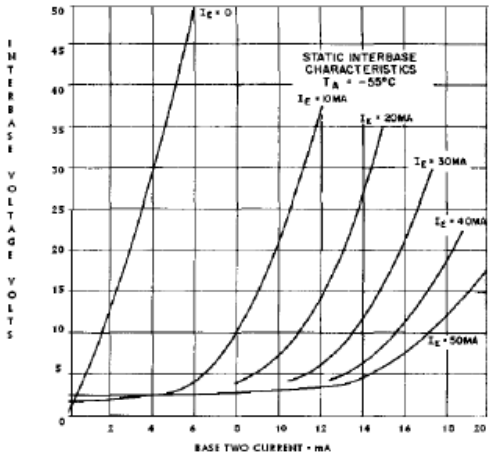
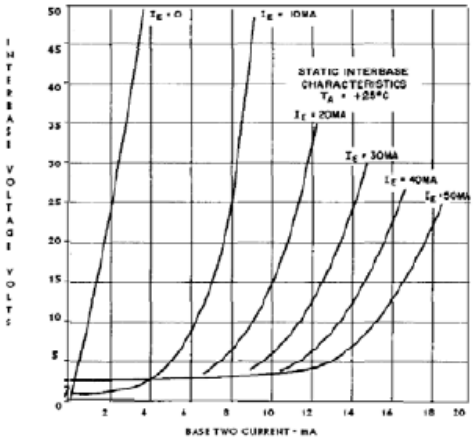
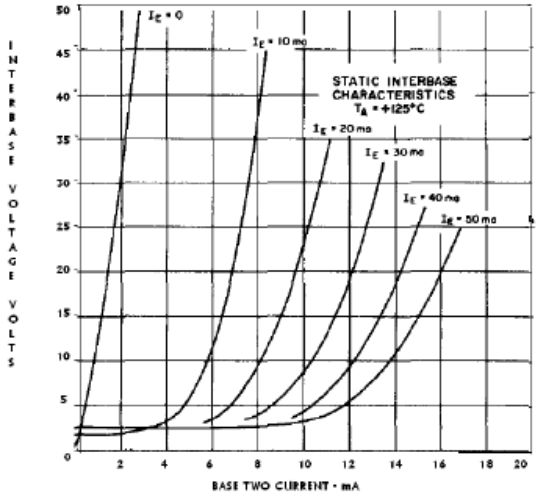


Static interbase characteristic curves showing important parameters and measurement points







Static emitter characteristics

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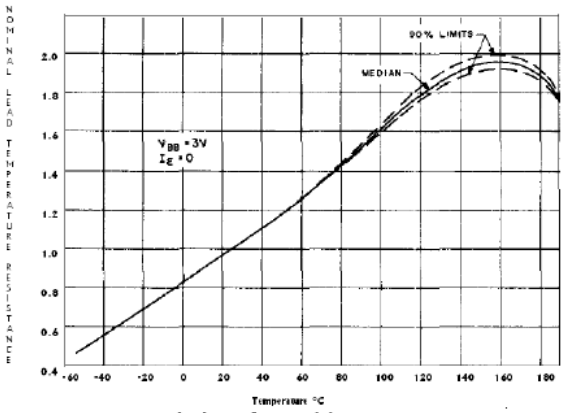
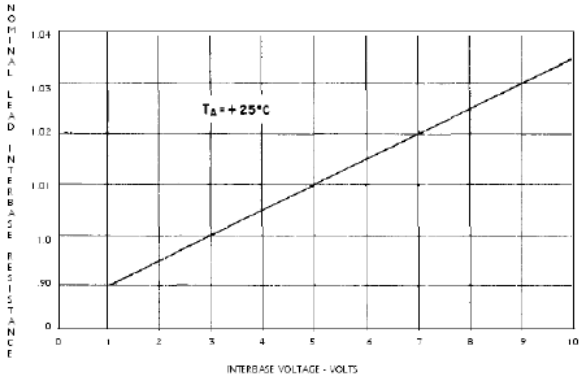
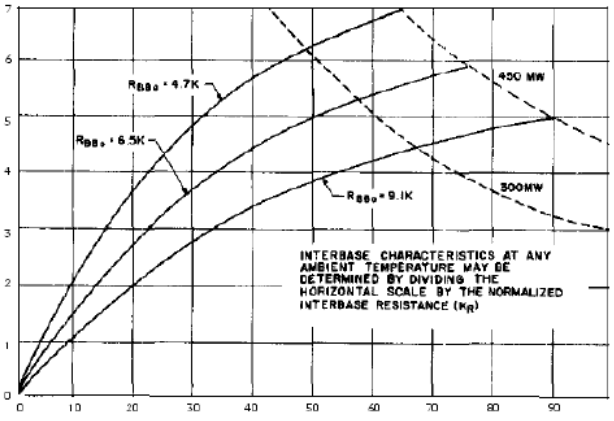


Variation of R_{BB} with temperature



Variation of R_{BB} with voltage



Characteristic curve