DIGITRON™ Semiconductors

High-reliability discrete products
and engineering services since 1977

2N3583-2N3585, 2N4240 – NPN
2N6420-2N6423 - PNP

SILICON MEDIUM 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

Ratings	Symbol	2N3583 2N6420	2N3584 2N6421	2N3585 2N6422	2N4240 2N6423	Unit
Collector-Emitter Voltage	V_{CEO}	175	250	300	300	Vdc
Collector-Base Voltage	V_{CBO}	250	375	500	500	Vdc
Emitter-Base Voltage	V_{EBO}	6.0				Vdc
Base Current	I_B	1.0				Adc
Collector Current **Peak**	I_C	1.0 5.0	2.0 5.0			Adc
Total Power Dissipation T_C = 25°C Derate above 25°C	P_D	35 0.2				W W/°C
Operating & Storage Junction Temperature Range	T_J, T_{stg}	-65 to +200				°C
Maximum Thermal Resistance Junction to Case	$R_{\theta JC}$	5.0				°C/W

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

Characteristics		Symbol	Min.	Max.	Unit
OFF CHARACTERISTICS					
Collector-Emitter Sustaining Voltage					
I_C = 200mA, I_B = 0 – NPN	2N3583, 2N6420	$V_{CEO(sus)}$	175	-	Vdc
	2N3584, 2N6421		250	-	
	2N3585, 2N6422		300	-	
I_C = 50mA, I_B = 0 – PNP	2N4240, 2N6423		300	-	
Collector Cutoff Current	2N3583, 2N6420	I_{CEO}	-	10	mA
V_{CE} = -150V, I_B = 0	2N3584, 2N6421		-	5.0	
	2N3585, 2N6422		-	5.0	
	2N4240, 2N6423		-	5.0	
Collector Cutoff Current		I_{CEX}			mA
V_{CE} = 225V, $V_{BE(off)}$ = 1.5V	2N3583, 2N6420		-	1.0	
V_{CE} = 340V, $V_{BE(off)}$ = 1.5V	2N3584, 2N6421		-	1.0	
V_{CE} = 450V, $V_{BE(off)}$ = 1.5V	2N3585, 2N6422		-	1.0	
	2N4240, 2N6423		-	2.0	
V_{CE} = 225V, $V_{BE(off)}$ = 1.5V, T_C = 150°C	2N3583, 2N6420		-	3.0	
V_{CE} = 300V, $V_{BE(off)}$ = 1.5V, T_C = 150°C	2N3584, 2N6421		-	3.0	
	2N3585, 2N6422		-	3.0	
	2N4240, 2N6423		-	5.0	
Emitter Cutoff Current	2N3583, 2N6420	I_{Ebo}	-	5.0	mAdc
V_{EB} = 6.0Vdc, I_C = 0	2N3584, 2N6421		-	0.5	
	2N3585, 2N6422		-	0.5	
	2N4240, 2N6423		-	0.5	

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

Characteristics		Symbol	Min.	Max.	Unit
ON CHARACTERISTICS[1]					
DC Current Gain					
I_C = 0.1Adc, V_{CE} = 10 Vdc	All devices		40	-	
I_C = 0.5Adc, V_{CE} = 10 Vdc	2N3583, 2N6420		40	200	
I_C = 0.75Adc, V_{CE} = 2.0 Vdc	2N4240, 2N6423		10	100	
I_C = 0.75Adc, V_{CE} = 10 Vdc	2N4240, 2N6423	h_{FE}	30	150	-
I_C = 1.0Adc, V_{CE} = 2.0 Vdc	2N3584, 2N6421		8.0	80	
	2N3585, 2N6422		8.0	80	
I_C = 1.0Adc, V_{CE} = 10 Vdc	2N3583, 2N6420		10		
	2N3584, 2N6421		25	100	
	2N3585, 2N6422		25	100	
Collector-Emitter Saturation Voltage					
I_C = 0.75Adc, I_B = 75mAdc	2N4240, 2N6423		-	1.0	
I_C = 1.0Adc, I_B = 125mAdc	2N3583, 2N6420	$V_{CE(sat)}$	-	5.0	Vdc
	2N3584, 2N6421		-	0.75	
	2N3585, 2N6422		-	0.75	
Base-Emitter Saturation Voltage					
I_C = 0.75Adc, I_B = 75mAdc	2N4240, 2N6423	$V_{BE(SAT)}$	-	1.8	Vdc
I_C = 1.0Adc, I_B = 125mAdc	2N3584, 2N6421		-	1.4	
	2N3585, 2N6422		-	1.4	
Base-Emitter On Voltage		$V_{BE(on)}$			V
I_C = 1.0A, V_{CE} = 10V			-	1.4	

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

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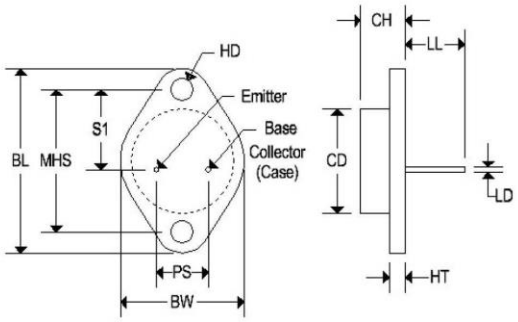
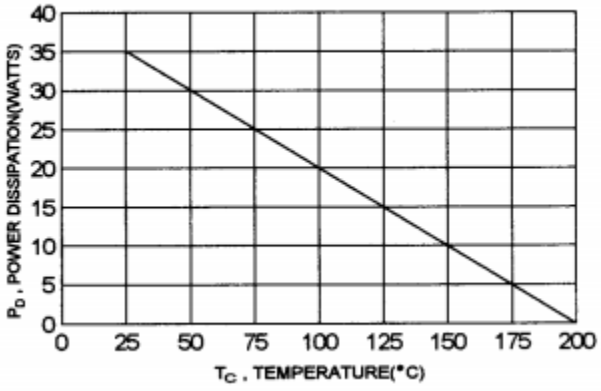
MECHANICAL CHARACTERISTICS

Case	TO-66
Marking	Alpha-numeric
Polarity	See below



Dim	TO-66			
	Inches		Millimeters	
	Min	Max	Min	Max
BL	1.205	1.280	30.60	32.50
CD	0.445	0.557	11.303	14.148
CH	0.257	0.284	6.540	7.220
LL	0.374	0.413	9.500	10.50
BW	0.680	0.727	17.26	18.46
LD	0.030	0.036	0.760	0.920
HT	0.054	0.065	1.380	1.650
MHS	0.951	0.976	24.16	24.78
S1	0.545	0.614	13.84	15.60
HD	0.131	0.154	3.320	3.920
PS	0.191	0.210	4.860	5.340

FIGURE -1 POWER DERATING



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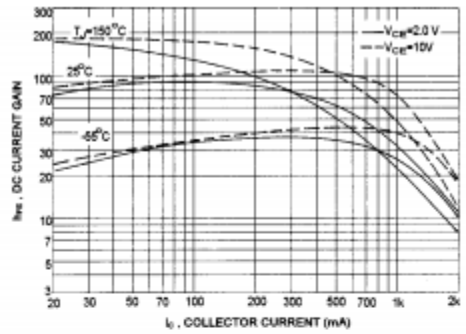
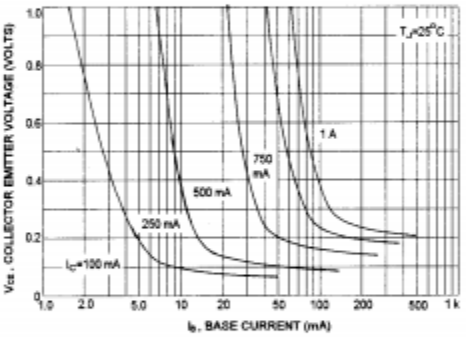
SILICON MEDIUM POWER TRANSISTORS

2N3583 thru 2N3585,2N4240

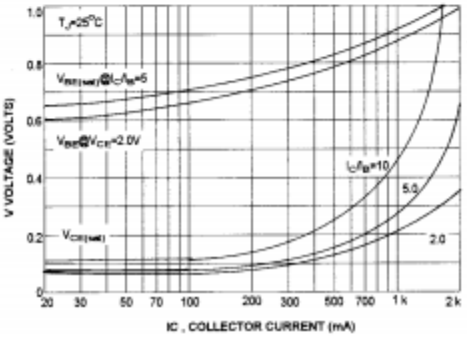
DC CURRENT GAIN



COLLECTOR SATURATION REGION

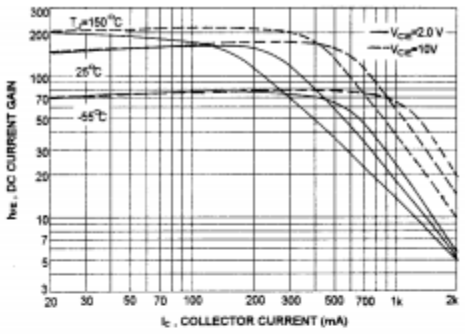


"ON" VOLTAGES

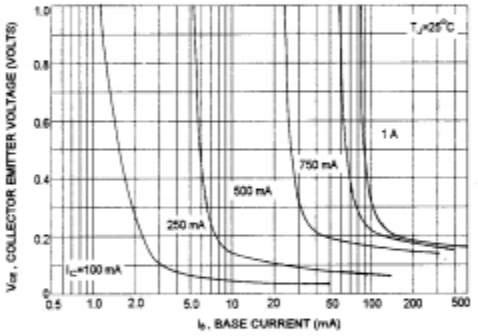


2N6420 thru 2N6423

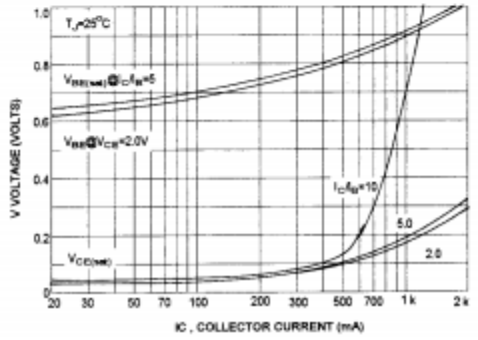
DC CURRENT GAIN



COLLECTOR SATURATION REGION



"ON" VOLTAGES



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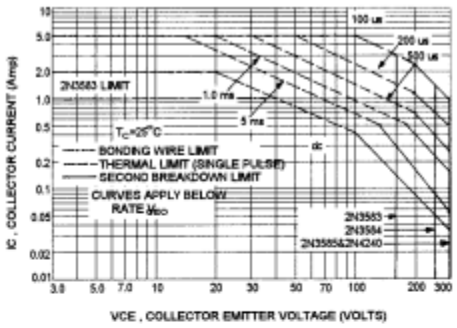
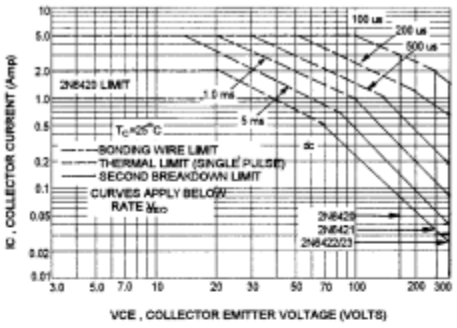
2N3583 thru 2N3585,2N4240

ACTIVE REGION SAFE OPERATING AREA

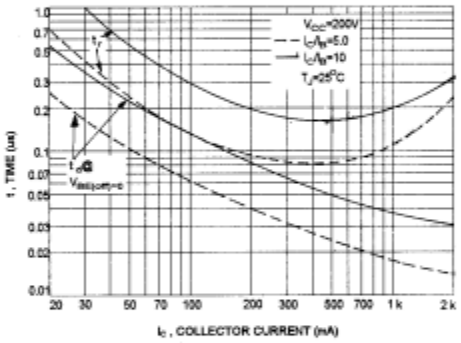


2N6420 thru 2N6423

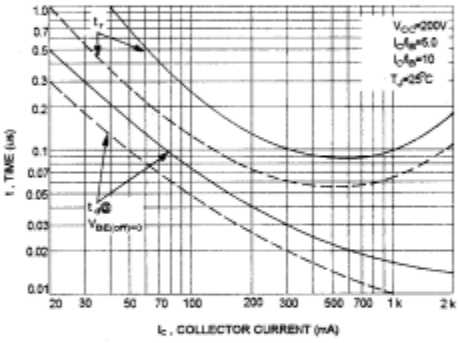
ACTIVE REGION SAFE OPERATING AREA



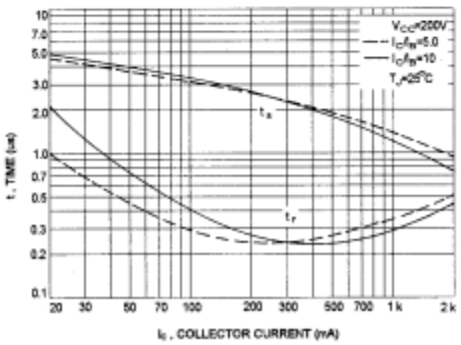
TURN-ON TIME



TURN-ON TIME



TURN-OFF TIME



TURN-OFF TIME