DIGITRON™ Semiconductors

High-reliability discrete products
and engineering services since 1977

MJ413, MJ423

NPN SILICON 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	MJ413	MJ423	Unit
Collector emitter voltage	V_{CEX}	400	400	Vdc
Collector base voltage	V_{CB}	400	400	Vdc
Emitter base voltage	V_{EB}	5.0	5.0	Vdc
Collector current-Continuous	I_C	10	10	Adc
Base current	I_B	2.0	2.0	Adc
Total power dissipation @ T_C = 25°C **Derate above 25°C**	P_D	125 1.0		W W/°C
Operating temperature range	T_J	-65 to +150		°C
Storage temperature range	T_{stg}	-65 to +200		°C
Thermal resistance, junction to case	$R_{\Theta JC}$	1.0		°C/W

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

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector emitter sustaining voltage[1] (I_C = 100mA, I_B = 0)		$V_{(BR)CEO(sus)}$	325	-	Vdc
Collector cutoff current (V_{CEV} = 400Vdc, $V_{EB(OFF)}$ = 1.5 Vdc) (V_{CEV} = 400Vdc, $V_{EB(OFF)}$ = 1.5dc, T_C = 125°C)		I_{CEX}	- -	0.25 0.5	mAdc
Emitter cutoff current (V_{BE} = 5Vdc, I_C = 0)		I_{EBO}	-	5.0	mAdc
ON CHARACTERISTICS					
DC current gain [1] (I_C = 0.5Adc, V_{CE} = 5Vdc) (I_C = 1.0Adc, V_{CE} = 5Vdc) (I_C = 1.0Adc, V_{CE} = 5Vdc) (I_C = 2.5Adc, V_{CE} = 5Vdc)	 MJ413 MJ423	h_{FE}	 20 15 30 10	 80 - 90 -	-
Collector emitter saturation voltage[1] (I_C = 0.5Adc, I_B = 0.05Adc) (I_C = 1.0Adc, I_B = 0.10Adc)	 MJ413 MJ423	$V_{CE(sat)}$	 - -	 0.8 0.8	Vdc
Base emitter saturation voltage (I_C = 0.5Adc, I_B = 0.05Adc) (I_C = 1.0Adc, I_B = 0.10Adc)	 MJ413 MJ423	$V_{BE(sat)}$	 - -	 1.25 1.25	Vdc

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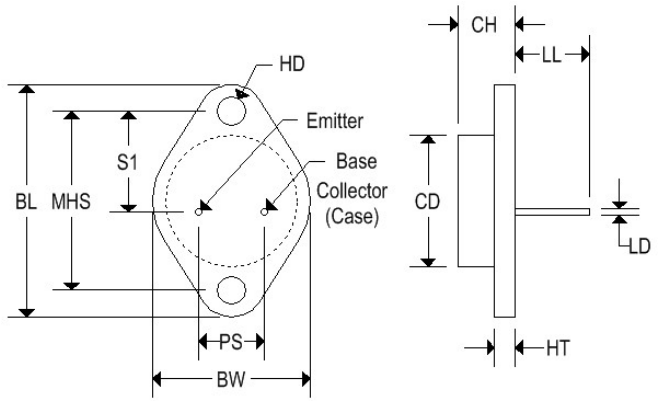
ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise specified)

Characteristic	Symbol	Min	Max	Unit
DYNAMIC CHARACTERISTICS				
Current gain- bandwidth product (I_C = 200mAdc, V_{CE} = 10Vdc, f = 1MHz)	f_T	2.5	-	MHz

Note 1: Pulse test: pulse width ≤ 300µs, duty cycle ≤ 2.0%.

MECHANICAL CHARACTERISTICS

Case	TO-3
Marking	Alpha-numeric
Polarity	See below



	TO-3			
	Inches		Millimeters	
	Min	Max	Min	Max
CD	-	0.875	-	22.220
CH	0.250	0.380	6.860	9.650
HT	0.060	0.135	1.520	3.430
BW	-	1.050	-	26.670
HD	0.131	0.188	3.330	4.780
LD	0.038	0.043	0.970	1.090
LL	0.312	0.500	7.920	12.700
BL	1.550 REF		39.370 REF	
MHS	1.177	1.197	29.900	30.400
PS	0.420	0.440	10.670	11.180
S1	0.655	0.675	16.640	17.150

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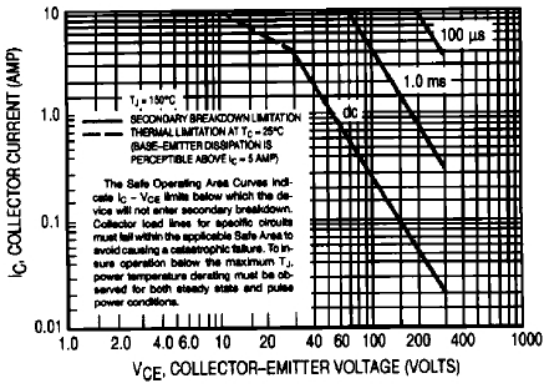

Figure 1. Active–Region Safe–Operating Area

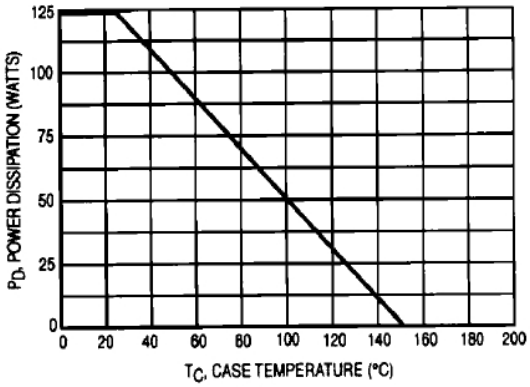

Figure 2. Power–Temperature Derating Curve

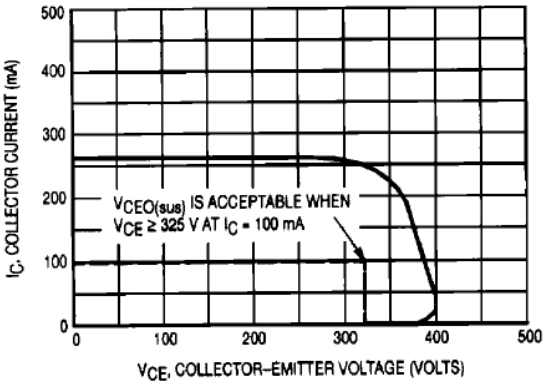

Figure 3. Sustaining Voltage Test Load Line

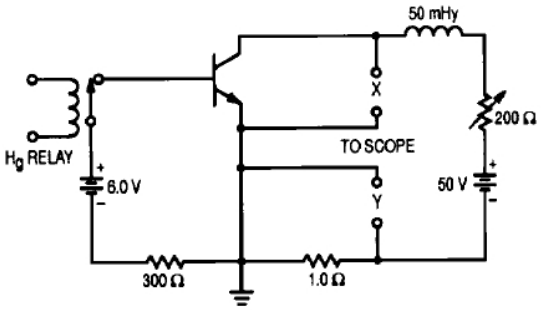

Figure 4. Sustaining Voltage Test Circuit

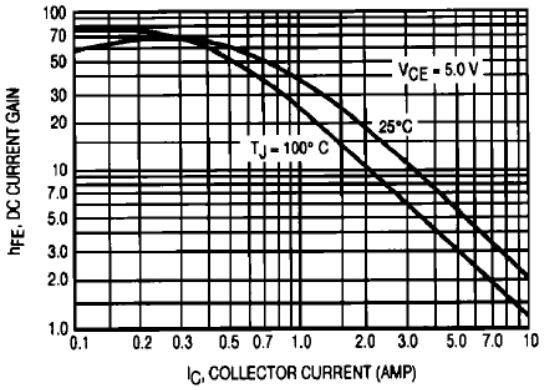

Figure 5. Current Gain

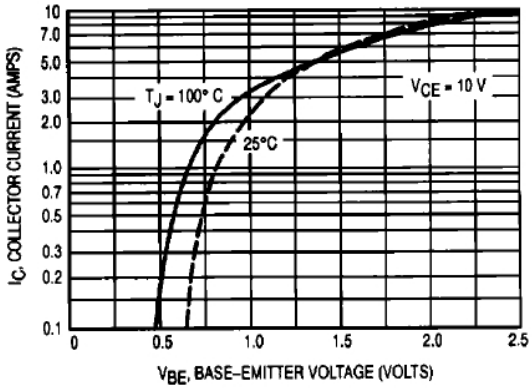

Figure 6. Transconductance