MJD31,MJD31C(NPN)
MJD32,MJD32C(PNP)

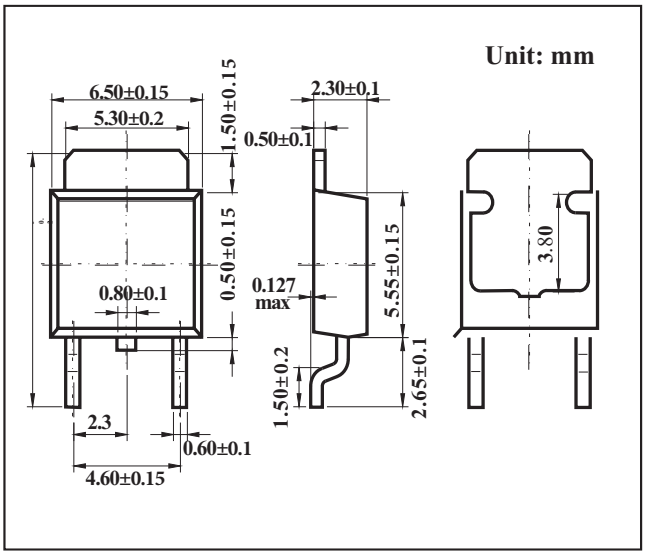
TO-252 Plastic-Encapsulate Transistors

Features

- Lead Formed for Surface Mount Applications in Plastic
- Sleeves Pb-Free Packages are Available
- Complementary Power Transistors

MECHANICAL DATA

- Case style:TO-252 molded plastic
- Mounting position:any



MAXIMUM RATINGS AND CHARACTERISTICS

@ 25°C Ambient Temperature (unless otherwise noted)

Parameter		Symbol	Rating	Unit
Collector-emitter voltage	MJD31,MJD32	V_{CEO}	40	V
	MJD31C,MJD32C		100	V
Collector-base voltage	MJD31,MJD32	V_{CB}	40	V
	MJD31C,MJD32C		100	V
Emitter-base voltage		V_{EB}	5	V
Collector current		I_C	3	A
Collector current (pulse)		I_{CP}	5	A
Base current		I_B	1	A
Total Device Dissipation FR-5 Board @T_A = 25℃ Derate above 25℃		P_D	15 0.12	W W/℃
Total Device Dissipation Alumina Substrate @T_A = 25℃ Derate above 25℃		P_D	1.56 0.012	W W/℃
Junction temperature		T_j	150	℃
Storage temperature		T_{stg}	-65 to +150	℃
Thermal Resistance, Junction-to-Case		$R_{\theta JC}$	8.3	℃/W
Thermal Resistance, Junction-to-Ambient		$R_{\theta JA}$	80	℃/W
Lead Temperature for Soldering Purposes		TL	260	℃

Parameter		Symbol	Testconditons	Min	Typ	Max	Unit
Collector-emitter sustaining voltage	MJD31,MJD32	$V_{CEo(sus)}$	I_C = 30 mA, I_B = 0	40			V
	MJD31C,MJD32C			100			V
Collector cutoff current	MJD31,MJD32	I_{CEO}	V_{CE} = 40 V, I_B = 0			50	μA
	MJD31C,MJD32C		V_{CE} = 60 V, I_B = 0			50	μA
Collector cutoff current		I_{CES}	V_{CE} = Rated V_{CEO},V_{EB} = 0			20	μA
Emitter cutoff current		I_{EBO}	V_{BE} = 5V, I_C = 0			1	mA
DC current gain *		h_{FE}	I_C = 1 A, V_{CE} = 4 V	25			
			I_C = 3 A, V_{CE} = 4 V	10		50	
Collector-emitter saturation voltage *		$V_{CE(sat)}$	I_C = 3 A, I_B = 375 mA			1.2	V
Base-emitter saturation voltage *		$V_{BE(on)}$	I_C = 3 A, V_{CE} = 4 V			1.8	V
Current-gain-bandwidth product *2		f_T	I_C = 500 mA,V_{CE} = 10 V,f_{test} = 1 MHz	3			MHz
Small-signal current gain		h_{fe}	I_C = 0.5 A, V_{CE} = 10 V, f = 1 kHz	20			

*1 Pulse test: pulse width ⩽ 300 μs, duty cycle ⩽ 2.0%.

*2 f_T= | h_{fe} | f_{test}

■ h_{FE} Classification

TYPE	MJD31	MJD31C	MJD32	MJD32C
Marking	J31	J31C	J32	J32C

RATINGS AND CHARACTERISTIC CURVES

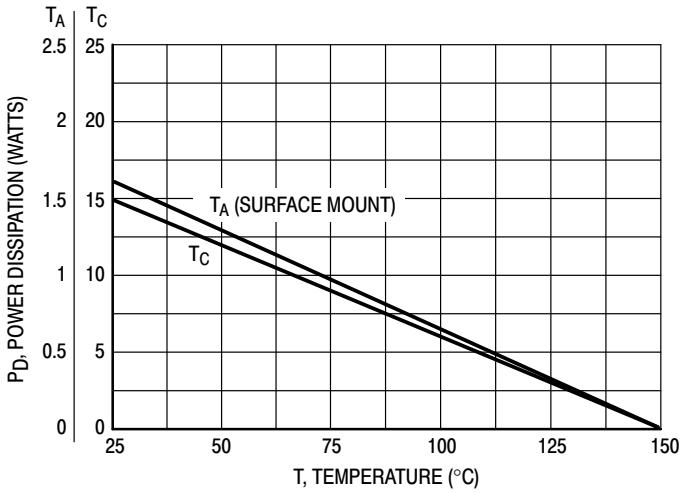
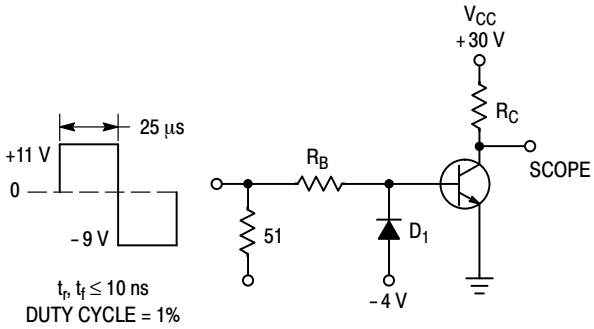


Figure 1. Power Derating



R_B and R_C VARIED TO OBTAIN DESIRED CURRENT LEVELS
D_1 MUST BE FAST RECOVERY TYPE, e.g.:
1N5825 USED ABOVE $I_B \approx 100$ mA
MSD6100 USED BELOW $I_B \approx 100$ mA
REVERSE ALL POLARITIES FOR PNP.

Figure 2. Switching Time Test Circuit

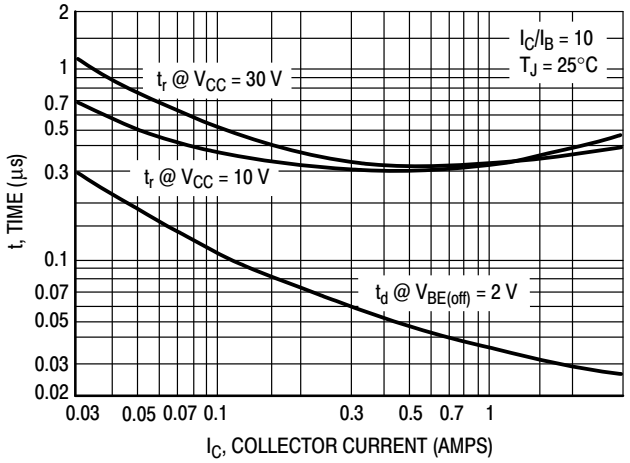


Figure 3. Turn−On Time

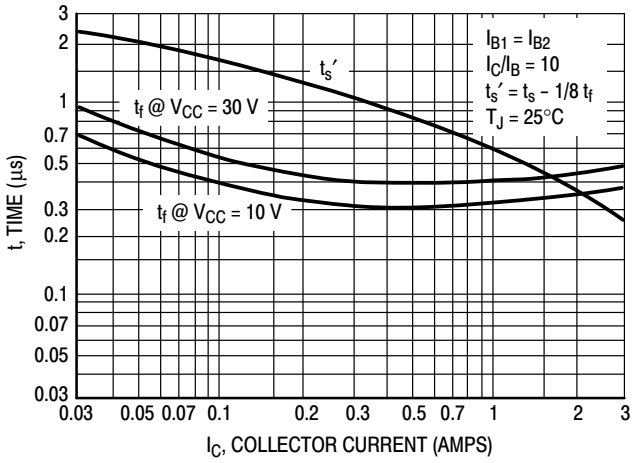


Figure 4. Turn−Off Time

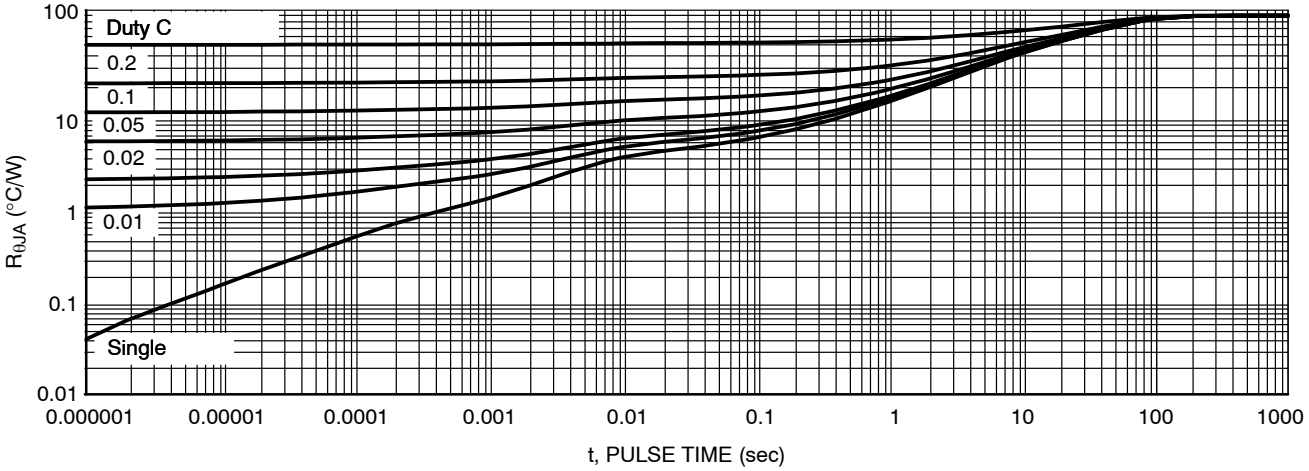


Figure 5. Thermal Response

RATINGS AND CHARACTERISTIC CURVES

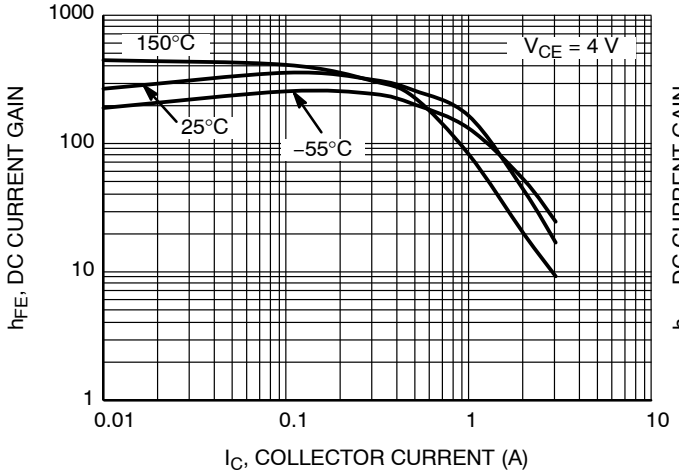


Figure 6. DC Current Gain at V_{CE} = 4 V

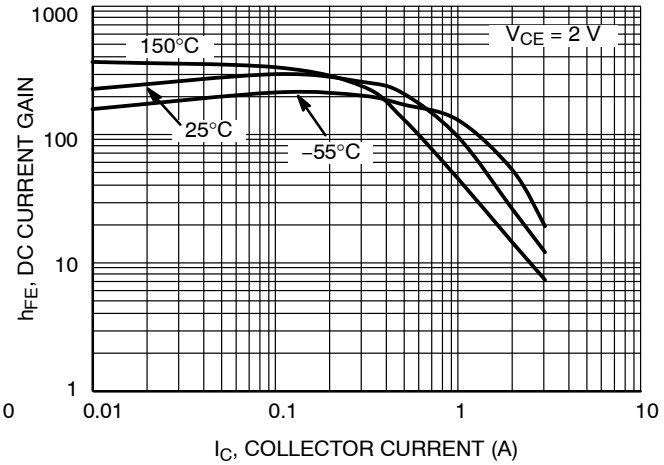


Figure 7. DC Current Gain at V_{CE} = 2 V

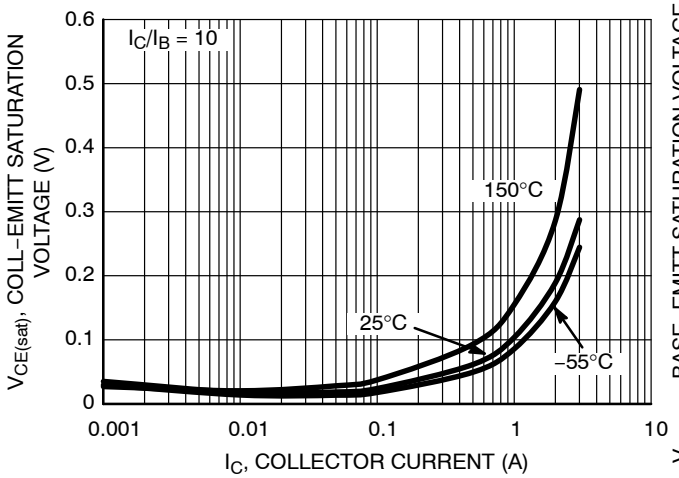


Figure 8. Collector−Emitter Saturation Voltage

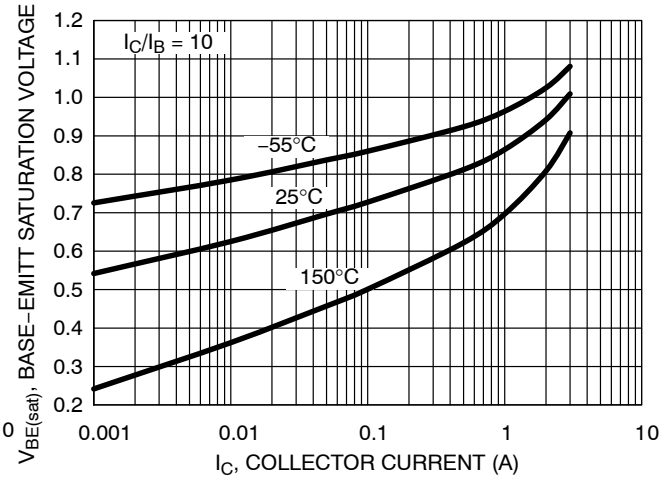


Figure 9. Base−Emitter Saturation Voltage

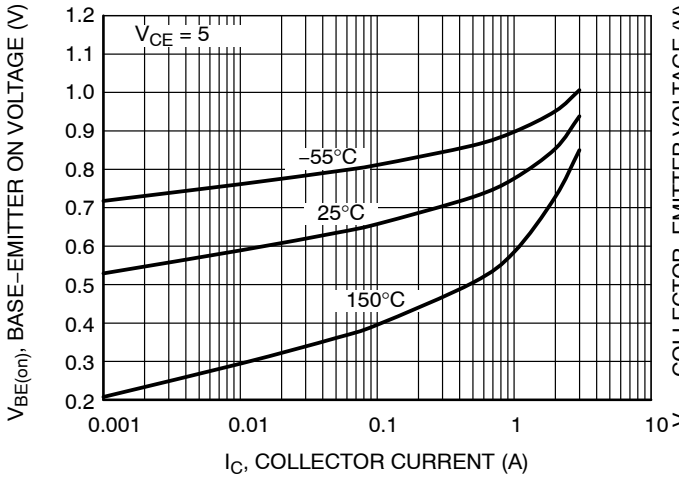


Figure 10. Base-Emitter "On" Voltage

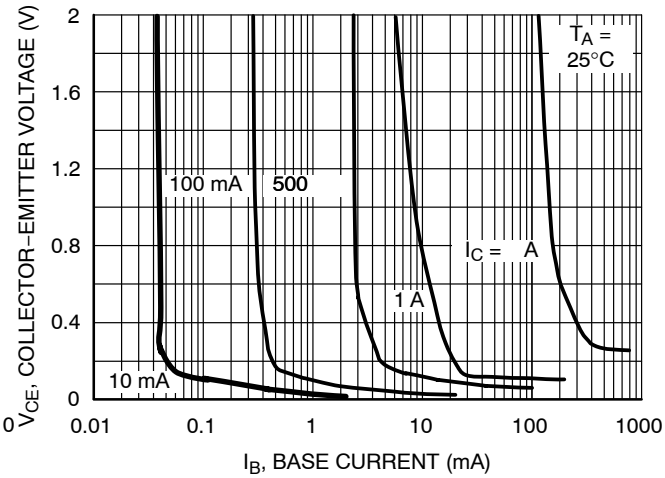


Figure 11. Collector Saturation Region

RATINGS AND CHARACTERISTIC CURVES

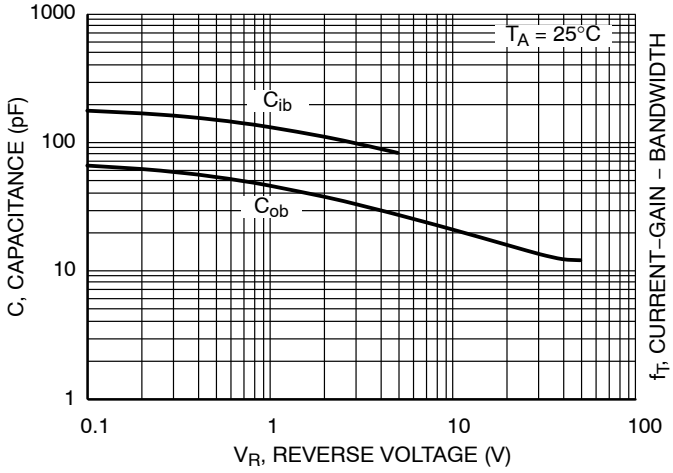


Figure 12. Capacitance

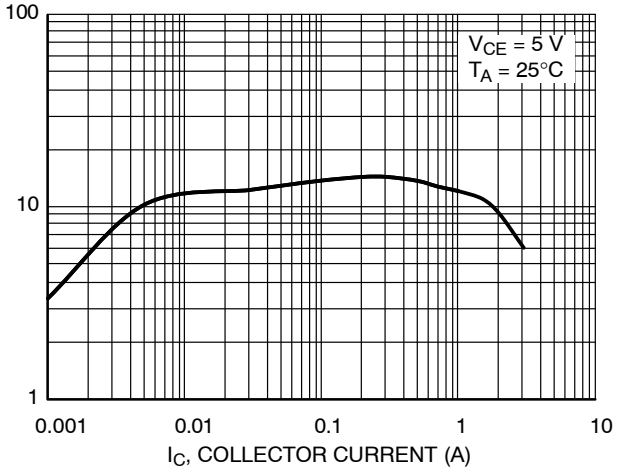


Figure 13. Current−Gain−Bandwidth Product

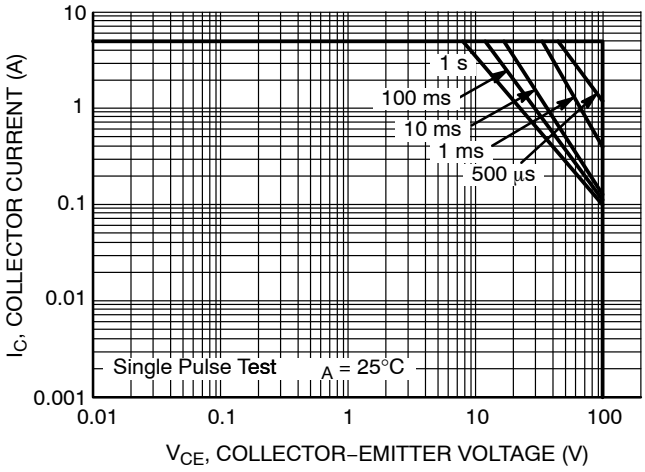


Figure 14. Safe Operating Area