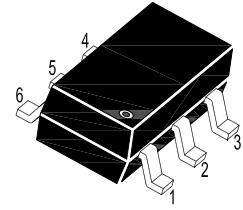
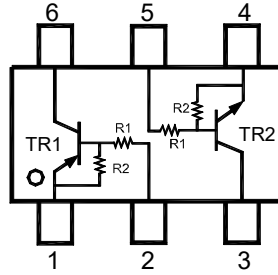


MMDTX237PDW

Complementary PNP/NPN Silicon Epitaxial Planar Digital Transistor

Features

- With built-in bias resistors



TR1: 1. Emitter 2. Base 6. Collector
 TR2: 4. Emitter 5. Base 3. Collector
 SOT-363 Plastic Package

PNP Absolute Maximum Ratings ($T_a = 25^\circ\text{C}$ unless otherwise specified)(TR1)

Parameter	Symbol	Value	Unit
Collector Base Voltage	$-V_{CBO}$	50	V
Collector Emitter Voltage	$-V_{CEO}$	50	V
Emitter Base Voltage	$-V_{EBO}$	5	V
Collector Current	$-I_C$	100	mA

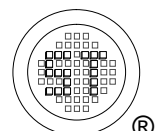
NPN Absolute Maximum Ratings ($T_a = 25^\circ\text{C}$ unless otherwise specified)(TR2)

Parameter	Symbol	Value	Unit
Collector Base Voltage	V_{CBO}	50	V
Collector Emitter Voltage	V_{CEO}	50	V
Emitter Base Voltage	V_{EBO}	5	V
Collector Current	I_C	100	mA

Thermal Resistance Ratings(TR1\TR2)

Parameter	Symbol	Max.	Unit
Total Power Dissipation	P_D	200	mW
Thermal Resistance Junction to Ambient ¹⁾	$R_{\theta JA}$	625	$^\circ\text{C}/\text{W}$
Operating Junction Temperature	T_j	150	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	- 55 to + 150	$^\circ\text{C}$

¹⁾ Device mounted on FR-4 substrate PC board, with minimum recommended pad layout.



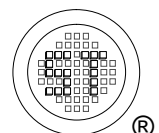
MMDTX237PDW

PNP Characteristics at $T_a = 25^\circ\text{C}$ unless otherwise specified (TR1)

Parameter	Symbol	Min.	Typ.	Max.	Unit
DC Current Gain at $-V_{CE} = 5\text{ V}$, $-I_C = 10\text{ mA}$	h_{FE}	80	-	-	-
Collector Base Cutoff Current at $-V_{CB} = 50\text{ V}$	$-I_{CBO}$	-	-	100	nA
Collector Emitter Cutoff Current at $-V_{CE} = 50\text{ V}$	$-I_{CEO}$	-	-	500	nA
Emitter Base Cutoff Current at $-V_{EB} = 5\text{ V}$	$-I_{EBO}$	-	-	145	μA
Collector Emitter Saturation Voltage at $-I_C = 5\text{ mA}$, $-I_B = 0.25\text{ mA}$	$-V_{CE(sat)}$	-	-	300	mV
Input Voltage (on) at $-V_{CE} = 0.2\text{ V}$, $-I_C = 5\text{ mA}$	$-V_{I(on)}$	-	-	1.1	V
Input Voltage (off) at $-V_{CE} = 5\text{ V}$, $-I_C = 0.1\text{ mA}$	$-V_{I(off)}$	0.5	-	-	V
Transition Frequency at $-V_{CE} = 10\text{ V}$, $-I_C = 5\text{ mA}$, $f = 100\text{ MHz}$	f_T	-	200	-	MHz
Input Resistance	R1	1.54	2.2	2.86	K Ω
Resistance Ratio	R2/R1	23.7	21.3	19.4	-

NPN Characteristics at $T_a = 25^\circ\text{C}$ unless otherwise specified (TR2)

Parameter	Symbol	Min.	Typ.	Max.	Unit
DC Current Gain at $V_{CE} = 5\text{ V}$, $I_C = 10\text{ mA}$	h_{FE}	80	-	-	-
Collector Base Cutoff Current at $V_{CB} = 50\text{ V}$	I_{CBO}	-	-	100	nA
Collector Emitter Cutoff Current at $V_{CE} = 50\text{ V}$	I_{CEO}	-	-	500	nA
Emitter Base Cutoff Current at $V_{EB} = 5\text{ V}$	I_{EBO}	-	-	145	μA
Collector Emitter Saturation Voltage at $I_C = 5\text{ mA}$, $I_B = 0.25\text{ mA}$	$V_{CE(sat)}$	-	-	300	mV
Input Voltage (on) at $V_{CE} = 0.2\text{ V}$, $I_C = 5\text{ mA}$	$V_{I(on)}$	-	-	1.1	V
Input Voltage (off) at $V_{CE} = 5\text{ V}$, $I_C = 0.1\text{ mA}$	$V_{I(off)}$	0.5	-	-	V
Transition Frequency at $V_{CE} = 10\text{ V}$, $I_C = 5\text{ mA}$, $f = 100\text{ MHz}$	f_T	-	250	-	MHz
Input Resistance	R1	1.54	2.2	2.86	K Ω
Resistance Ratio	R2/R1	23.7	21.3	19.4	-



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Electrical Characteristics Curves: TR1

Fig 1. Collector Current vs. $V_{I(ON)}$

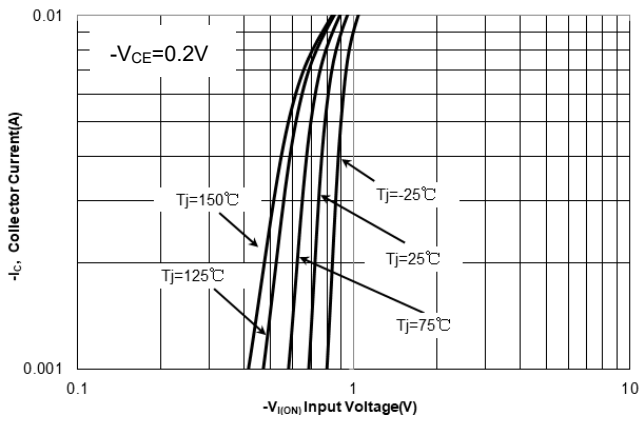


Fig 2. Collector Current vs. $V_{I(off)}$

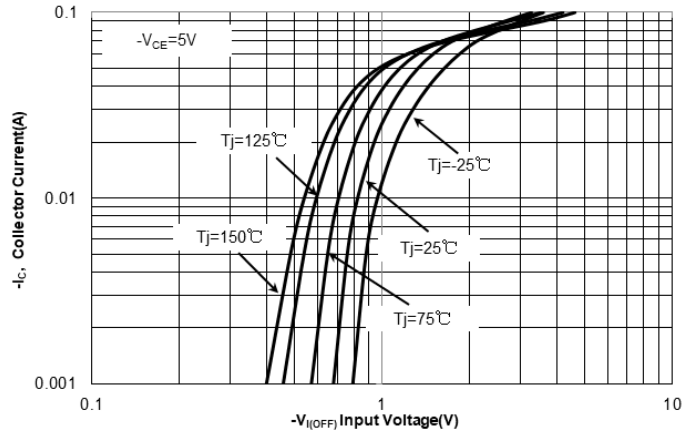


Fig 3. DC Current Gain vs. Collector Current

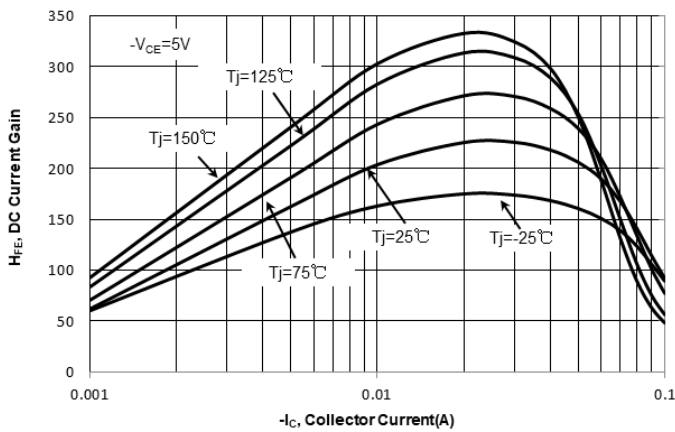
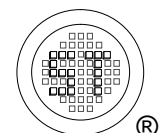
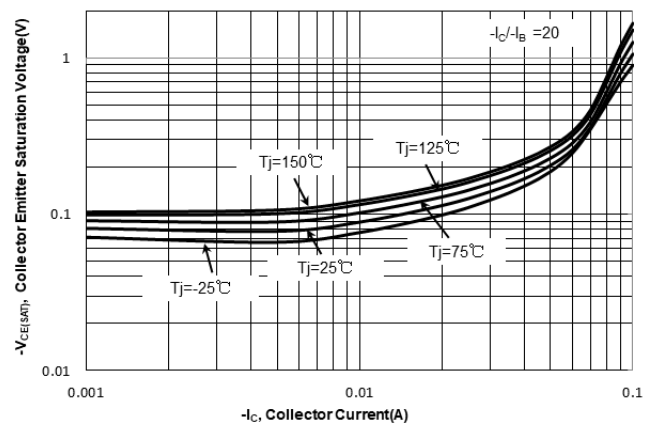


Fig 4. $V_{CE(sat)}$ vs. Collector Current



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Electrical Characteristics Curves: TR2

Fig 1. Collector Current vs. $V_{I(off)}$

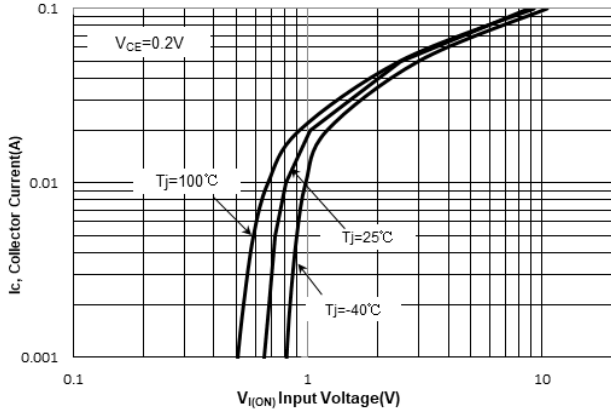


Fig 2. Collector Current vs. $V_{I(on)}$

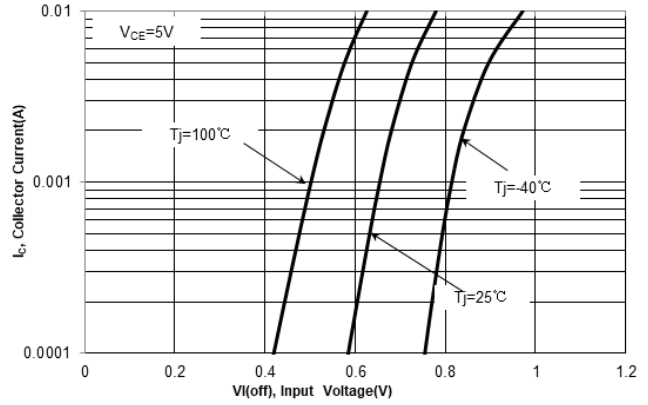


Fig 3. DC Current Gain vs. Collector Current

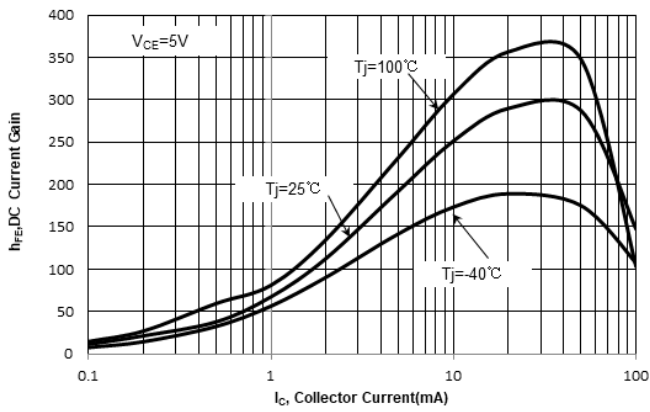
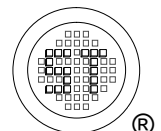
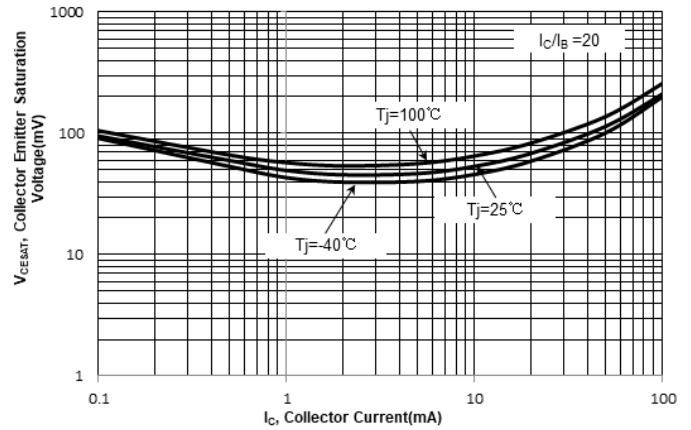


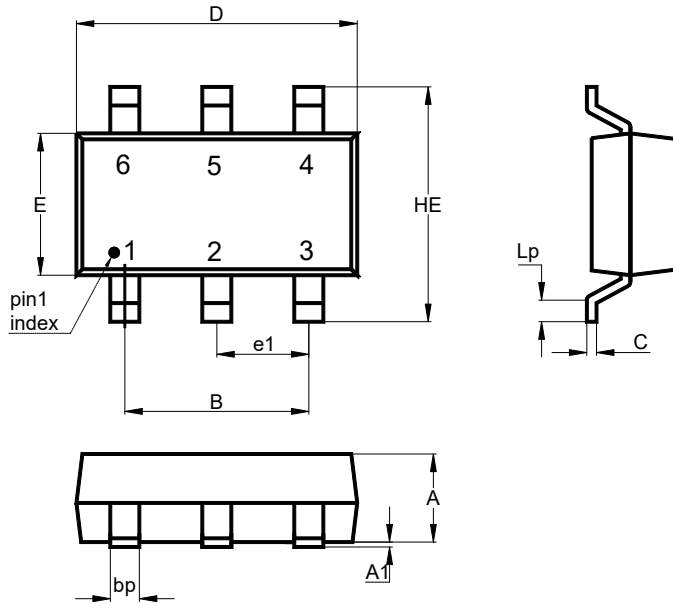
Fig 4. $V_{CE(sat)}$ vs. Collector Current



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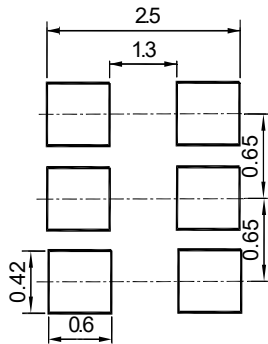
Package Outline (Dimensions in mm)

SOT-363



Unit	A	A1	B	C	D	E	e1	HE	Lp	bp
mm	1.0	0.1	1.3	0.25	2.2	1.35	0.65	2.2	0.4	0.3
	0.9	0	typ.	0.1	1.8	1.15	typ.	2.0	0.15	0.1

Recommended Soldering Footprint



Packing information

Package	Tape Width (mm)	Pitch		Reel Size		Per Reel Packing Quantity
		mm	inch	mm	inch	
SOT-363	8	4 ± 0.1	0.157 ± 0.004	178	7	3,000

Marking information

" D4 " = Part No.
 "YM" = Date Code Marking
 "Y" = Year
 "M" = Month
 Font type: Arial

