

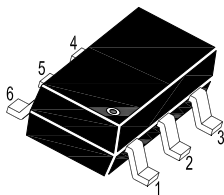
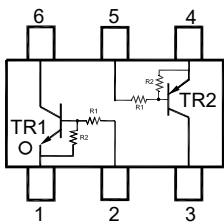
# MMDTX241DW

## Complementary NPN/PNP Silicon Epitaxial Planar Digital Transistor

For switching and interface circuit and drivecircuit applications

### Features

- Transistors with different polarity and built-in bias resistors R1 and R2
- Simplification of circuit design
- Reduces number of components and board space



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

### Absolute Maximum Ratings at (T<sub>a</sub> = 25°C):TR1

Parameter	Symbol	Value	Unit
Collector Base Voltage	V <sub>CBO</sub>	50	V
Collector Emitter Voltage	V <sub>CEO</sub>	50	V
Emitter Base Voltage	V <sub>EBO</sub>	10	V
Collector Current	I <sub>c</sub>	100	mA

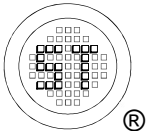
### Absolute Maximum Ratings at (T<sub>a</sub> = 25°C): TR2

Parameter	Symbol	Value	Unit
Collector Base Voltage	-V <sub>CBO</sub>	50	V
Collector Emitter Voltage	-V <sub>CEO</sub>	50	V
Emitter Base Voltage	-V <sub>EBO</sub>	10	V
Collector Current	-I <sub>c</sub>	100	mA

### Absolute Maximum Ratings at (T<sub>a</sub> = 25°C):TR1 and TR2

Parameter	Symbol	Value	Unit
Total Power Dissipation	P <sub>tot</sub>	200	mW
Junction Temperature	T <sub>j</sub>	150	°C
Storage Temperature Range	T <sub>stg</sub>	- 55 to + 150	°C
Thermal Resistance Junction to Ambient <sup>1)</sup>	R <sub>θJA</sub>	625	°C/W

<sup>1)</sup> Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout



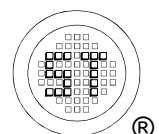
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## Characteristics at $T_a = 25^\circ\text{C}$ :TR1

Parameter	Symbol	Min.	Typ.	Max.	Unit
DC Current Gain at $V_{CE} = 5\text{ V}$ , $I_C = 10\text{ mA}$	$h_{FE}$	70	-	-	-
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 $V_{EB} = 10\text{ V}$	$I_{EBO}$	0.17	-	0.33	mA
Collector Emitter Saturation Voltage at $I_C = 5\text{ mA}$ , $I_B = 0.25\text{ mA}$	$V_{CE(sat)}$	-	-	0.3	V
Input Voltage (OFF) at $V_{CE} = 5\text{ V}$ , $I_C = 100\text{ }\mu\text{A}$	$V_{I(OFF)}$	1	-	1.5	V
Input Voltage (ON) at $V_{CE} = 0.2\text{ V}$ , $I_C = 5\text{ mA}$	$V_{I(ON)}$	1.3	-	3	V
Gain Bandwidth Product at $V_{CE} = 10\text{ V}$ , $I_C = 5\text{ mA}$ , $f = 100\text{ MHz}$	$f_T$	-	250	-	MHz
Collector Output Capacitance at $V_{CB} = 10\text{ V}$ , $f = 1\text{ MHz}$	$C_{ob}$	-	-	6	pF
Input Resistance	$R_1$	15.4	22	28.6	K $\Omega$
Resistance Ratio	$R_1/R_2$	0.9	1	1.1	-

## Characteristics at $T_a = 25^\circ\text{C}$ :TR2

Parameter	Symbol	Min.	Typ.	Max.	Unit
DC Current Gain at $-V_{CE} = 5\text{ V}$ , $-I_C = 10\text{ mA}$	$h_{FE}$	70	-	-	-
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 $-V_{EB} = 10\text{ V}$	$-I_{EBO}$	0.17	-	0.33	mA
Collector Emitter Saturation Voltage at $-I_C = 5\text{ mA}$ , $-I_B = 0.25\text{ mA}$	$-V_{CE(sat)}$	-	-	0.3	V
Input Voltage (OFF) at $-V_{CE} = 5\text{ V}$ , $-I_C = 100\text{ }\mu\text{A}$	$-V_{I(OFF)}$	1	-	1.5	V
Input Voltage (ON) at $-V_{CE} = 0.2\text{ V}$ , $-I_C = 5\text{ mA}$	$-V_{I(ON)}$	1.3	-	3	V
Gain Bandwidth Product at $-V_{CE} = 10\text{ V}$ , $-I_C = 5\text{ mA}$ , $f = 100\text{ MHz}$	$f_T$	-	200	-	MHz
Collector Output Capacitance at $-V_{CB} = 10\text{ V}$ , $f = 1\text{ MHz}$	$C_{ob}$	-	-	6	pF
Input Resistance	$R_1$	15.4	22	28.6	K $\Omega$
Resistance Ratio	$R_1/R_2$	0.9	1	1.1	-



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## Electrical Characteristics Curves :TR1

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

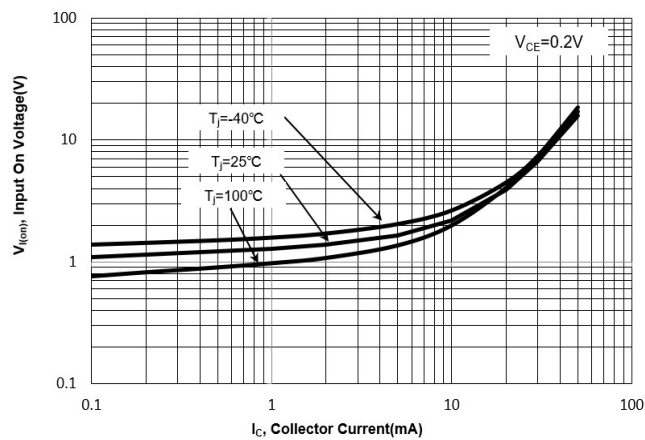


Fig 2.  $V_{I(off)}$  vs. Collector Current

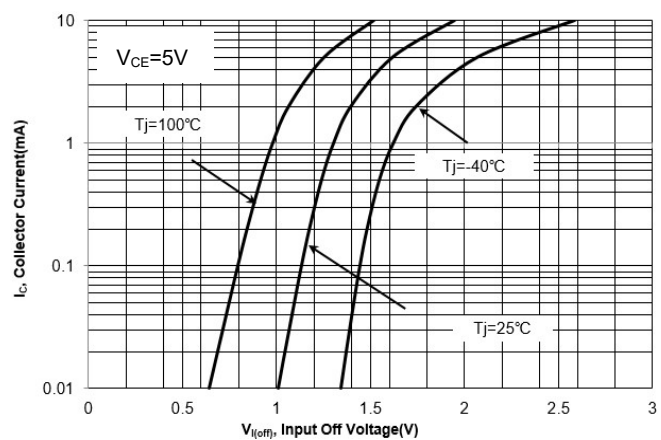


Fig 3. DC Current Gain vs. Collector Current

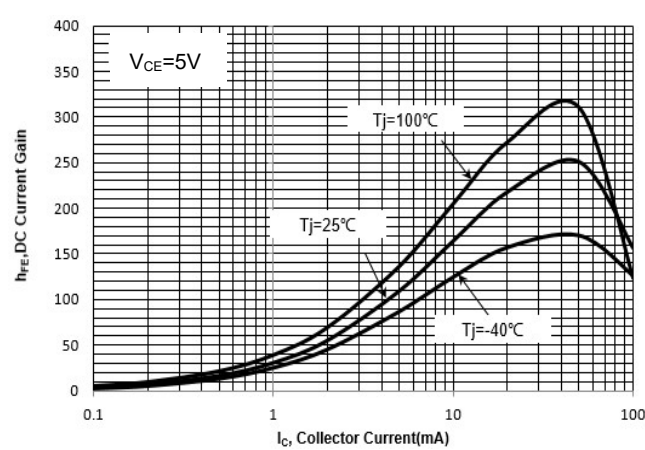
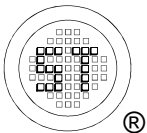
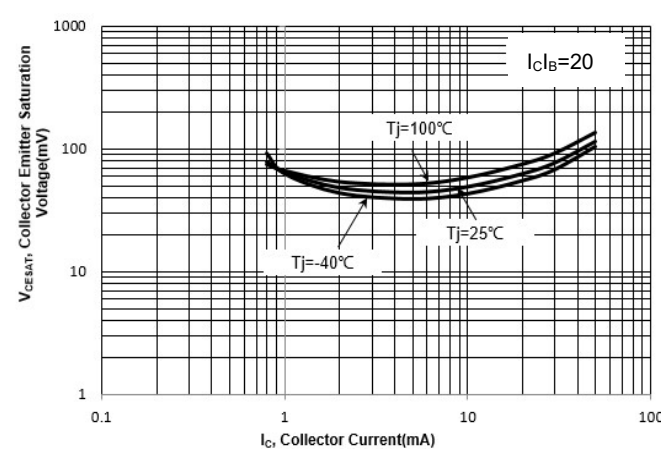


Fig 4.  $V_{CE(sat)}$  vs. Collector Current



# MMDTX241DW

## Electrical Characteristics Curves :TR2

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

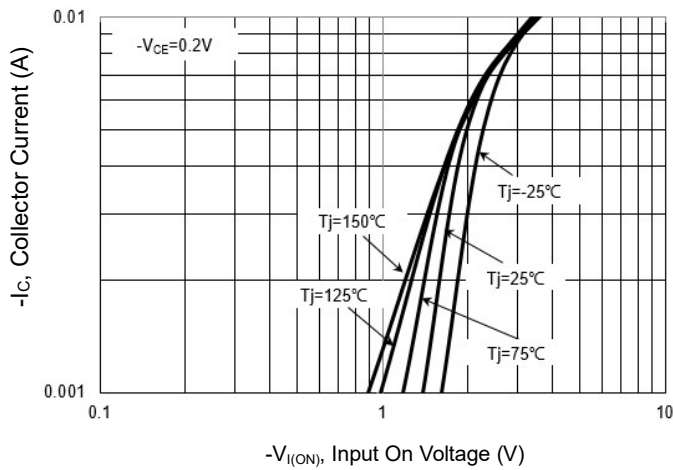


Fig 2.  $V_{I(off)}$  vs. Collector Current

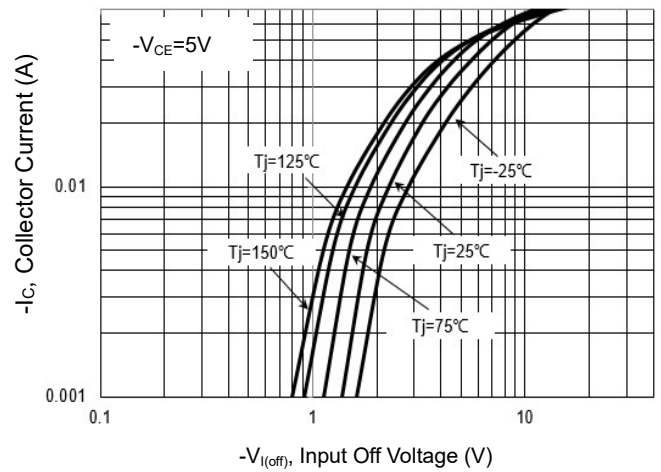


Fig 3. DC Current Gain vs. Collector Current

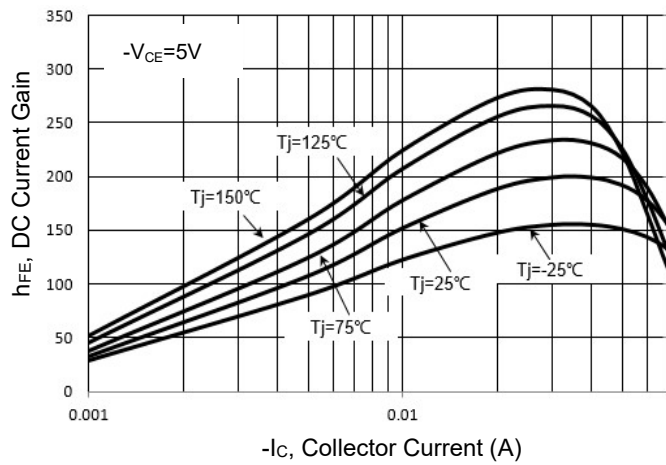
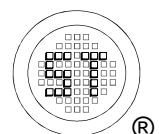
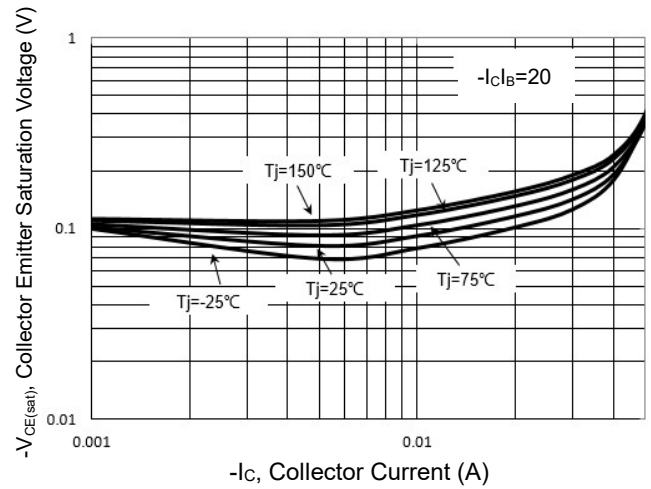


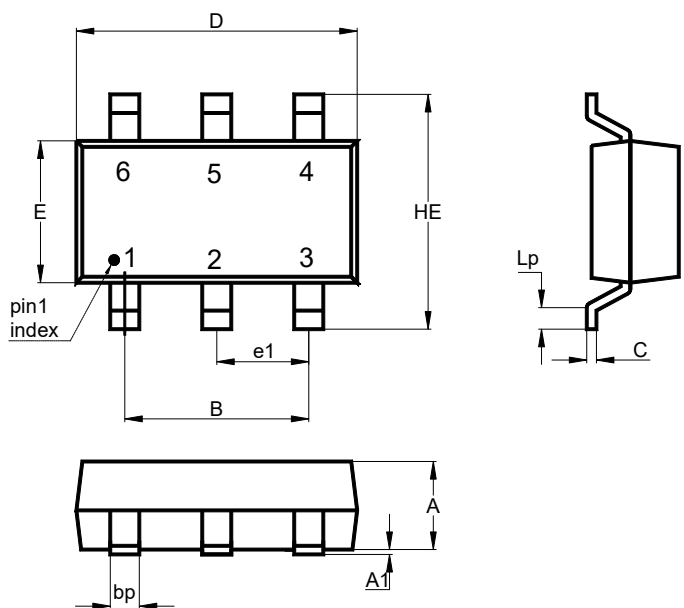
Fig 4.  $V_{CE(sat)}$  vs. Collector Current



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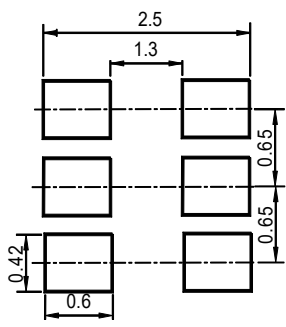
## Package Outline (Dimensions in mm)

SOT-363



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

## Recommended Soldering Footprint

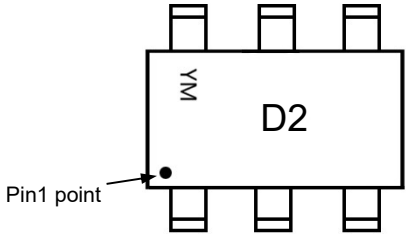


## Packing information

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

"D2" = Part No.  
"YM" = Date Code Marking  
"Y" = Year  
"M" = Month  
Font type: Arial



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