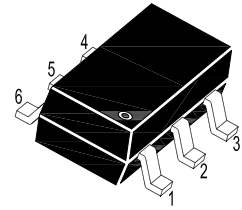
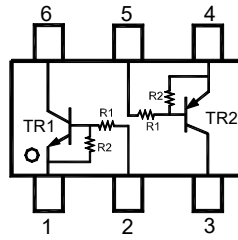


# MMDTX431DW

## Complementary NPN/PNP Silicon Epitaxial Planar Digital Transistor

### Features

- Epitaxial planar die construction
- Built-In biasing resistors



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

### Resistor Value

Resistance	R1 (K $\Omega$ )	R2 (K $\Omega$ )
Value	4.7	4.7

### Maximum Ratings ( $T_a = 25^\circ\text{C}$ ):TR1

Parameter	Symbol	Value	Unit
Collector Emitter Voltage	$V_{CE0}$	50	V
Emitter Base Voltage	$V_{EBO}$	- 10 to + 30	V
Collector Current	$I_c$	100	mA
Peak Collector Current	$I_{CM}$	100	mA

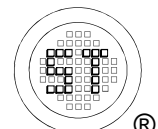
### Maximum Ratings ( $T_a = 25^\circ\text{C}$ ):TR2

Parameter	Symbol	Value	Unit
Collector Emitter Voltage	$-V_{CE0}$	50	V
Emitter Base Voltage	$-V_{EBO}$	+ 10 to - 30	V
Collector Current	$-I_c$	100	mA
Peak Collector Current	$-I_{CM}$	100	mA

### Maximum Ratings ( $T_a = 25^\circ\text{C}$ )

Parameter	Symbol	Value	Unit
Total Power Dissipation	$P_{tot}$	200	mW
Junction Temperature	$T_j$	150	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	- 55 to + 150	$^\circ\text{C}$
Thermal Resistance from Junction to Ambient <sup>1)</sup>	$R_{\theta JA}$	625	$^\circ\text{C/W}$

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



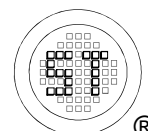
# MMDTX431DW

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

Parameter	Symbol	Min.	Typ.	Max.	Unit
DC Current Gain at $V_{CE} = 5\text{ V}$ , $I_C = 10\text{ mA}$	$h_{FE}$	50	-	-	-
Collector Base Cutoff Current at $V_{CB} = 50\text{ V}$	$I_{CBO}$	-	-	0.5	$\mu\text{A}$
Emitter Base Cutoff Current at $V_{EB} = 5\text{ V}$	$I_{EBO}$	-	-	0.88	mA
Collector Emitter Saturation Voltage at $I_C = 10\text{ mA}$ , $I_B = 0.5\text{ mA}$	$V_{CE(sat)}$	-	-	300	mV
Input Voltage (on) at $V_{CE} = 0.3\text{ V}$ , $I_C = 20\text{ mA}$	$V_{I(on)}$	-	-	3	V
Input Voltage (off) at $V_{CE} = 5\text{ V}$ , $I_C = 100\text{ }\mu\text{A}$	$V_{I(off)}$	0.5	-	-	V
Transition Frequency at $V_{CE} = 10\text{ V}$ , $I_E = 5\text{ mA}$ , $f = 100\text{ MHz}$	$f_T$	-	250	-	MHz
Input Resistance (R1) Tolerance	$\Delta R1$	- 30	-	+ 30	%
Resistance Ratio Tolerance	$\Delta R2 / R1$	- 20	-	+ 20	%

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

Parameter	Symbol	Min.	Typ.	Max.	Unit
DC Current Gain at $-V_{CE} = 5\text{ V}$ , $-I_C = 10\text{ mA}$	$h_{FE}$	40	-	-	-
Collector Base Cutoff Current at $-V_{CB} = 50\text{ V}$	$-I_{CBO}$	-	-	0.5	$\mu\text{A}$
Emitter Base Cutoff Current at $-V_{EB} = 5\text{ V}$	$-I_{EBO}$	-	-	0.88	mA
Collector Emitter Saturation Voltage at $-I_C = 10\text{ mA}$ , $-I_B = 0.5\text{ mA}$	$-V_{CE(sat)}$	-	-	300	mV
Input Voltage (on) at $-V_{CE} = 0.3\text{ V}$ , $-I_C = 20\text{ mA}$	$-V_{I(on)}$	-	-	3	V
Input Voltage (off) at $-V_{CE} = 5\text{ V}$ , $-I_C = 100\text{ }\mu\text{A}$	$-V_{I(off)}$	0.5	-	-	V
Transition Frequency at $-V_{CE} = 10\text{ V}$ , $-I_E = 5\text{ mA}$ , $f = 100\text{ MHz}$	$f_T$	-	250	-	MHz
Input Resistance (R1) Tolerance	$\Delta R1$	- 30	-	+ 30	%
Resistance Ratio Tolerance	$\Delta R2 / R1$	- 20	-	+ 20	%



# MMDTX431DW

## Electrical Characteristics Curves:TR1

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

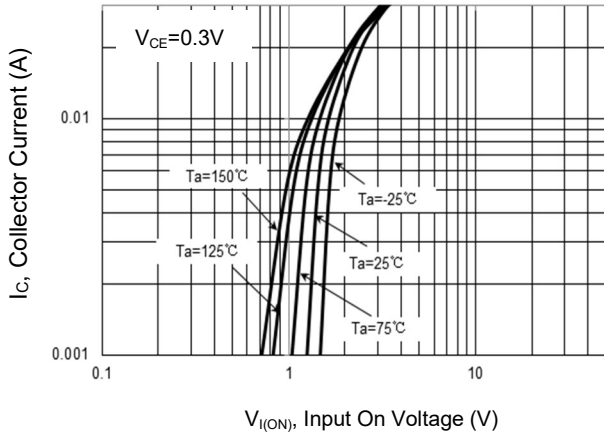


Fig 2.  $V_{I(off)}$  vs. Collector Current

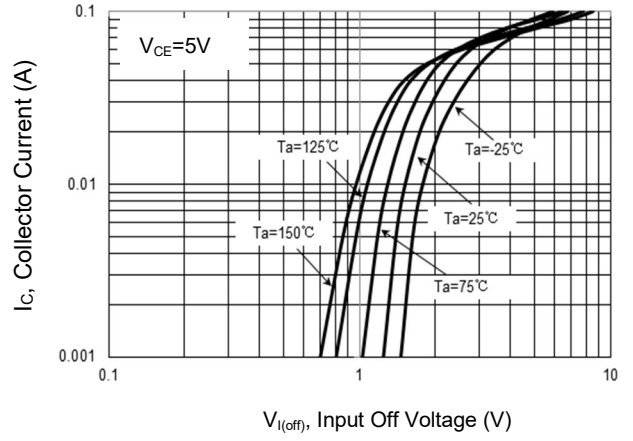


Fig 3. DC Current Gain vs. Collector Current

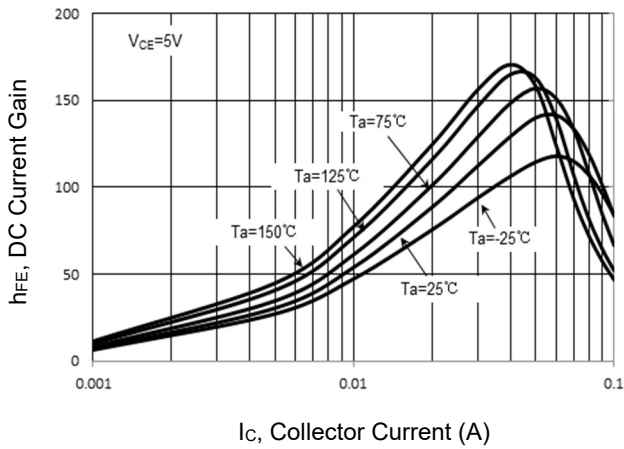
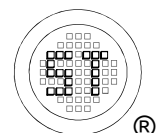
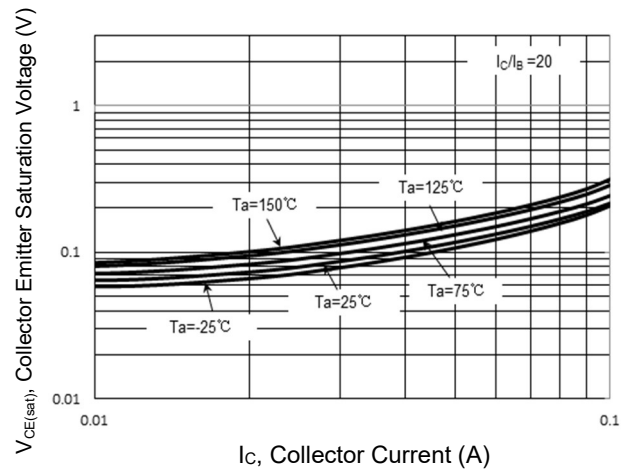


Fig 4.  $V_{CE(sat)}$  vs. Collector Current



# MMDTX431DW

## Electrical Characteristics Curves:TR2

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

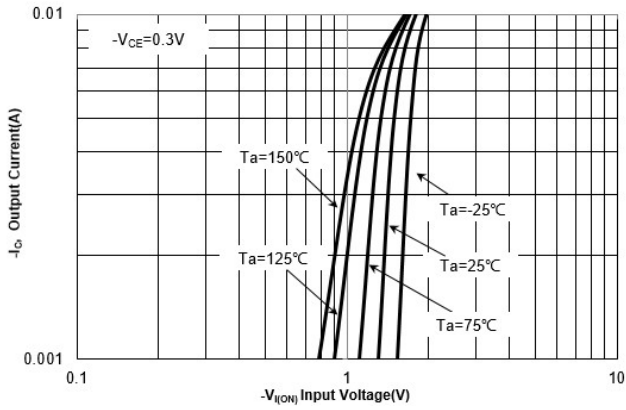


Fig 2.  $V_{I(off)}$  vs. Collector Current

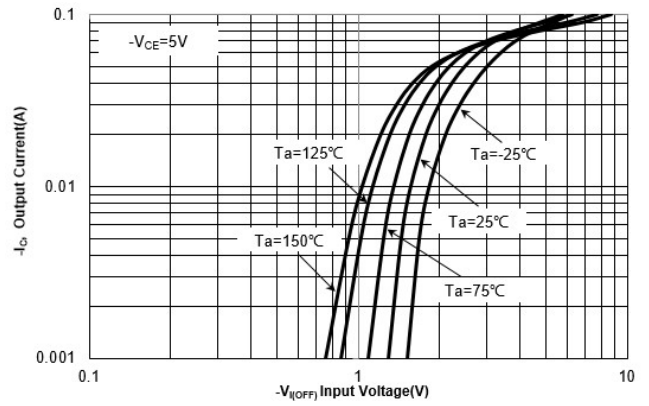


Fig 3. DC Current Gain vs. Collector Current

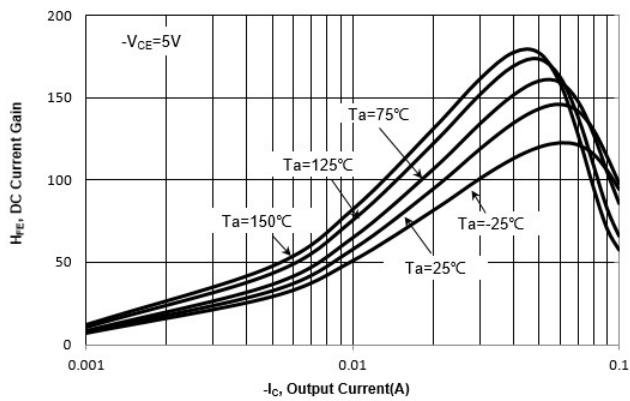
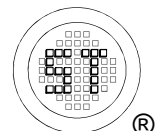
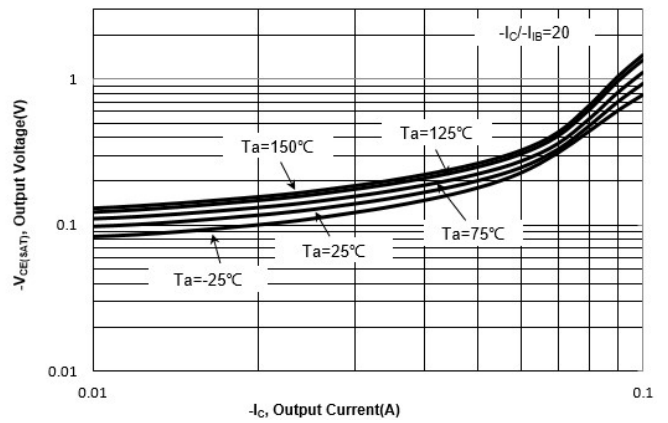


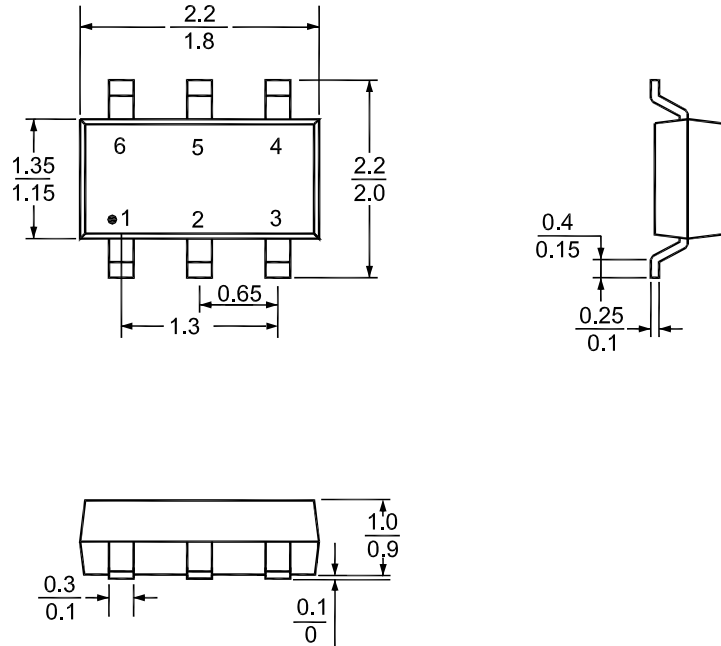
Fig 4.  $V_{CE(sat)}$  vs. Collector Current



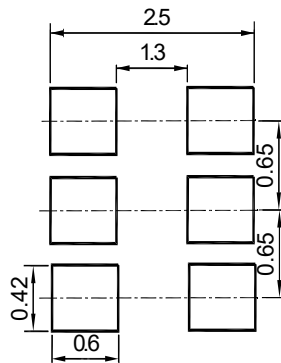
# MMDTX431DW

## Package Outline Dimensions (Units: mm)

SOT-363



## 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

" D5 " = Part No.  
 " YM " = Date Code Marking  
 " Y " = Year  
 " M " = Month  
 Font type: Arial

