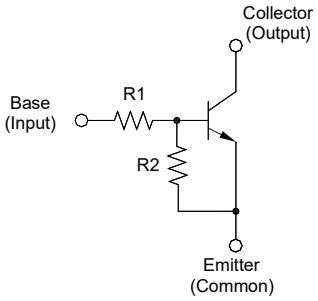
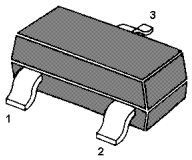
MMDT5N431

NPN Silicon Epitaxial Planar Digital Transistor

Features

- With built-in bias resistors, R1 = R2 = 4.7 KΩ
- Simplify circuit design
- Reduce a quantity of parts and manufacturing process





1. Base 2. Emitter 3. Collector
SOT-23 Plastic Package

Applications

- For switching and interface circuit and drive circuit

Absolute Maximum Ratings (T_a = 25 °C)

Parameter	Symbol	Value	Unit
Collector Base Voltage	V_{CBO}	50	V
Collector Emitter Voltage	V_{CEO}	50	V
Emitter Base Voltage	V_{EBO}	- 10 to + 30	V
Collector Current	I_C	500	mA
Power Dissipation	P_{tot}	200	mW
Junction Temperature	T_j	150	°C
Storage Temperature Range	T_{stg}	- 55 to + 150	°C

Thermal Characteristics

Parameter	Symbol	Max.	Unit
Thermal Resistance from Junction to Ambient [1)]	$R_{\theta JA}$	625	°C/W

[1)] Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.

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Characteristics at T_a = 25 °C

Parameter	Symbol	Min.	Typ.	Max.	Unit
DC Current Gain at V_{CE} = 5 V, I_C = 50 mA	h_{FE}	47	-	-	-
Collector Base Cutoff Current at V_{CB} = 50 V	I_{CBO}	-	-	0.5	µA
Emitter Base Cutoff Current at V_{EB} = 5 V	I_{EBO}	-	-	1.8	mA
Collector Emitter Saturation Voltage at I_C = 50 mA, I_B = 2.5 mA	$V_{CE(sat)}$	-	-	0.3	V
Input on Voltage at V_{CE} = 0.3 V, I_C = 20 mA	$V_{I(on)}$	3	-	-	V
Input off Voltage at V_{CE} = 5 V, I_C = 100 µA	$V_{I(off)}$	-	-	0.5	V
Transition frequency at V_{CE} = 10 V, $-I_E$ = 5 mA, f = 100 MHz	f_T	-	200	-	MHz
Input Resistance	R_1	3.29	4.7	6.11	KΩ
Resistance Ratio	R_2 / R_1	0.8	1	1.2	-

Electrical Characteristics Curves

Fig 1. $V_{I(ON)}$ Vs. Output Current

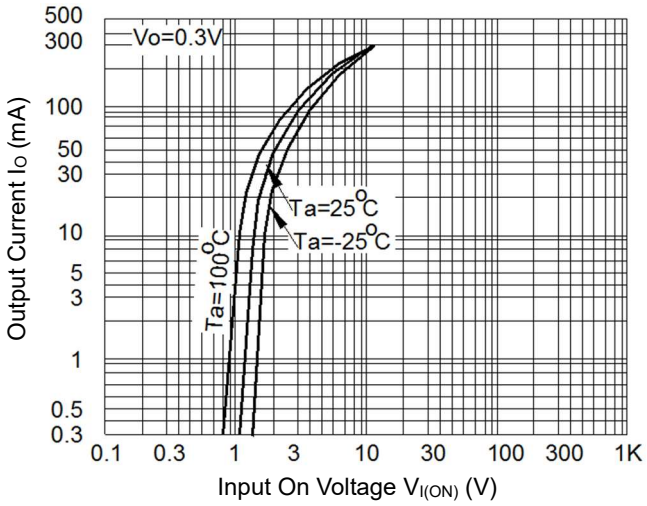


Fig 2. $V_{I(OFF)}$ Vs. Output Current

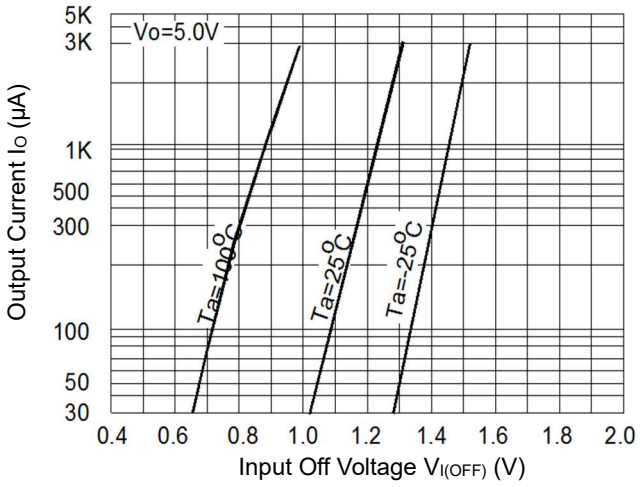


Fig 3. DC Current Gain Vs. Output Current

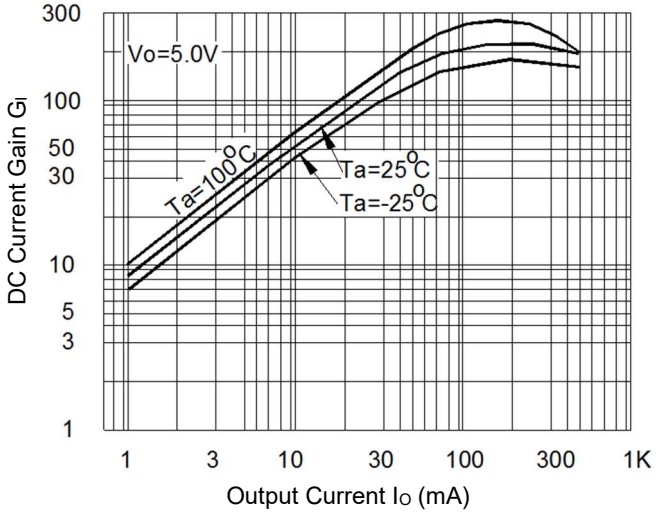
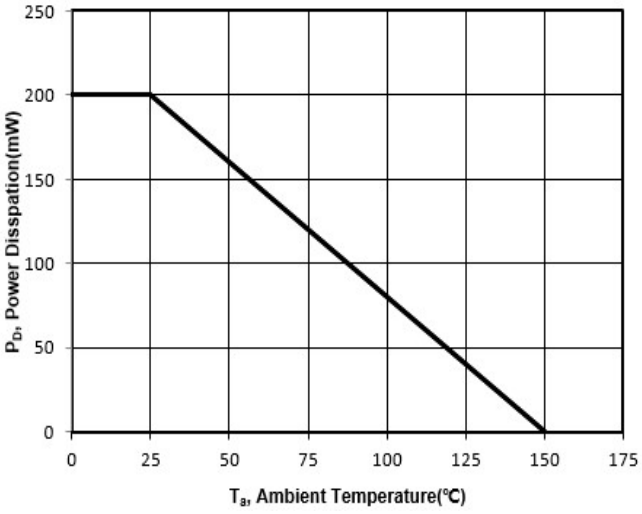


Fig 4. Power Derating Curve



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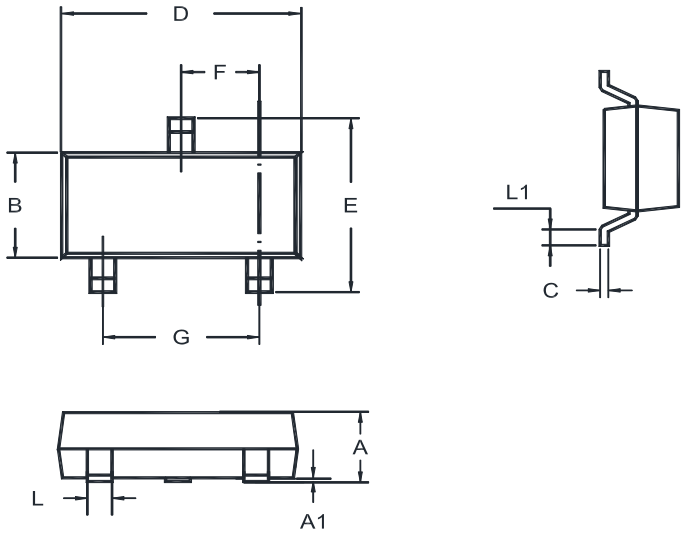
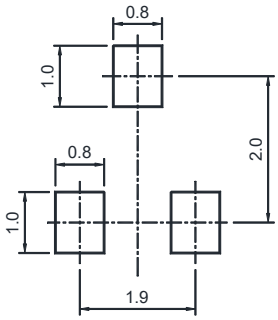
Package Outline (Dimensions in mm) SOT-23



Unit	A	A1	B	C	D	E	F	G	L	L1
mm	1.20 0.89	0.100 0.013	1.40 1.20	0.19 0.08	3.04 2.80	2.6 2.2	1.02 0.89	2.04 1.78	0.51 0.37	0.2 MIN

Recommended Soldering Footprint



Packing information

Package	Tape Width (mm)	Pitch		Reel Size		Per Reel Packing Quantity
		mm	inch	mm	inch	
SOT-23	8	4 ± 0.1	0.157 ± 0.004	178	7	3,000

Marking information

" HP " = Part No.

"YM" = Date Code Marking

"Y" = Year

"M" = Month

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