



Micro Commercial Components

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# MMDT4401

## NPN Plastic-Encapsulate Transistors

### Features

- Ultra-Small Surface Mount Package
- Epitaxial Planar Die Construction
- Case Material: Molded Plastic. UL Flammability Classification Rating 94-0 and MSL Rating 1
- Marking: K2X

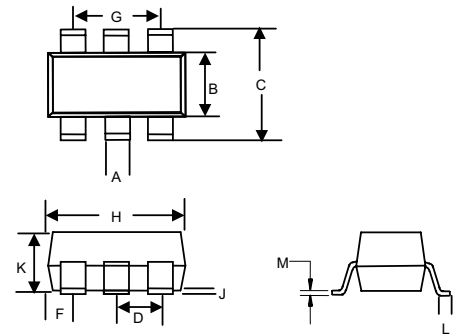
### Maximum Ratings @ 25°C Unless Otherwise Specified

Symbol	Rating	Rating(NPN)	Unit
V <sub>CEO</sub>	Collector-Emitter Voltage	40	V
V <sub>CBO</sub>	Collector-Base Voltage	60	V
V <sub>EBO</sub>	Emitter-Base Voltage	6	V
I <sub>C</sub>	Collector Current-Continuous	0.6	A
P <sub>C</sub>	Collector Dissipation	0.2	W
T <sub>J</sub>	Operating Junction Temperature	-55 to +150	°C
T <sub>STG</sub>	Storage Temperature	-55 to +150	°C

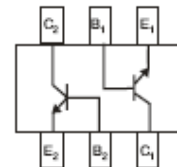
### Electrical Characteristics @ 25°C Unless Otherwise Specified

Symbol	Parameter	Min	Max	Units
V <sub>(BR)CEO</sub>	Collector-Emitter Breakdown Voltage (I <sub>C</sub> =1mA, I <sub>B</sub> =0)	40	---	Vdc
V <sub>(BR)CBO</sub>	Collector-Base Breakdown Voltage (I <sub>C</sub> =100μA, I <sub>E</sub> =0)	60	---	Vdc
V <sub>(BR)EBO</sub>	Collector-Emitter Breakdown Voltage (I <sub>E</sub> =100μA, I <sub>C</sub> =0)	6	---	Vdc
I <sub>CBO</sub>	Collector Cutoff Current (V <sub>CB</sub> =50Vdc, I <sub>E</sub> =0)	---	0.1	μA
I <sub>EBO</sub>	Emitter Cutoff Current (V <sub>EB</sub> =5Vdc, I <sub>C</sub> =0)	---	0.1	μA
h <sub>FE</sub>	DC Current Gain (I <sub>C</sub> =0.1mA, V <sub>CE</sub> =1Vdc) (I <sub>C</sub> =1mA, V <sub>CE</sub> =1Vdc) (I <sub>C</sub> =10mA, V <sub>CE</sub> =1Vdc) (I <sub>C</sub> =150mA, V <sub>CE</sub> =1Vdc) (I <sub>C</sub> =500mA, V <sub>CE</sub> =2Vdc)	20 40 80 100 40	--- --- --- 300 ---	---
V <sub>CE(sat)</sub>	Collector-Emitter Saturation Voltage (I <sub>C</sub> =150mA, I <sub>B</sub> =15mA) (I <sub>C</sub> =500mA, I <sub>B</sub> =50mA)	---	0.4 0.75	Vdc
V <sub>BE(sat)</sub>	Base-Emitter Saturation Voltage (I <sub>C</sub> =150mA, I <sub>B</sub> =15mA) (I <sub>C</sub> =500mA, I <sub>B</sub> =50mA)	0.75	0.95 1.2	Vdc
f <sub>T</sub>	Current Gain-Bandwidth Product (V <sub>CE</sub> =10.0Vdc, I <sub>C</sub> =20mA, f=100MHz)	250	---	MHz
C <sub>ob</sub>	Output Capacitance (V <sub>CB</sub> =5Vdc, f=1.0MHz, I <sub>E</sub> =0)	---	6.5	pF
t <sub>d</sub>	Delay Time	V <sub>CC</sub> =30V, I <sub>C</sub> =150mA, V <sub>BE</sub> =2.00V, I <sub>B1</sub> =15.00mA		ns
t <sub>r</sub>	Rise Time	V <sub>CC</sub> =30V, I <sub>C</sub> =150mA, I <sub>B1</sub> =-I <sub>B2</sub> =15mA		ns
t <sub>s</sub>	Storage Time	V <sub>CC</sub> =30V, I <sub>C</sub> =150mA, I <sub>B1</sub> =-I <sub>B2</sub> =15mA		ns
t <sub>f</sub>	Fall Time	V <sub>CC</sub> =30V, I <sub>C</sub> =150mA, I <sub>B1</sub> =-I <sub>B2</sub> =15mA		ns

### SOT-363



DIM	DIMENSIONS				NOTE
	INCHES		MM		
	MIN	MAX	MIN	MAX	
A	.004	.012	0.10	0.30	
B	.045	.053	1.15	1.35	
C	.079	.087	2.00	2.20	
D	.026		0.65Nominal		
F	.012	.016	0.30	0.40	
H	.071	.087	1.80	2.20	
J	---	.004	---	0.10	
K	.035	.039	0.90	1.00	
L	.010	.016	0.25	0.40	
M	.004	.016	0.10	0.25	



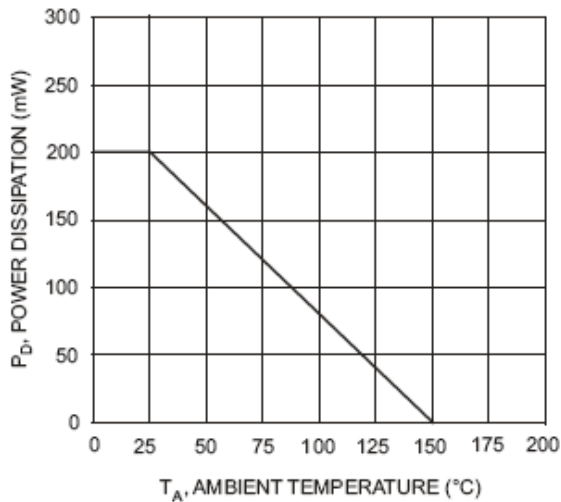


Fig. 1 Max Power Dissipation vs Ambient Temperature

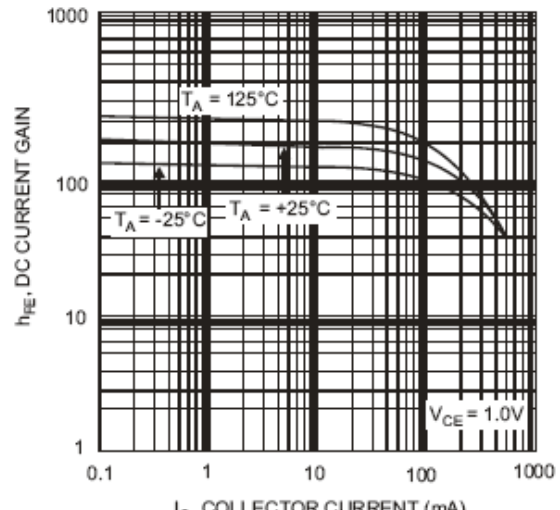


Fig. 2 Typical DC Current Gain vs Collector Current

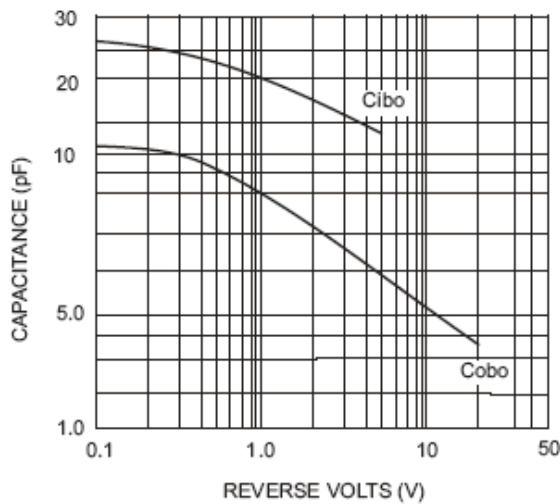


Fig. 3 Typical Capacitance

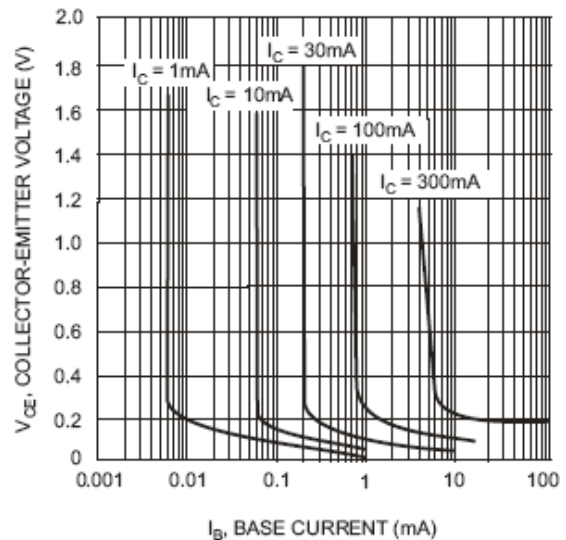


Fig. 4 Typical Collector Saturation Region

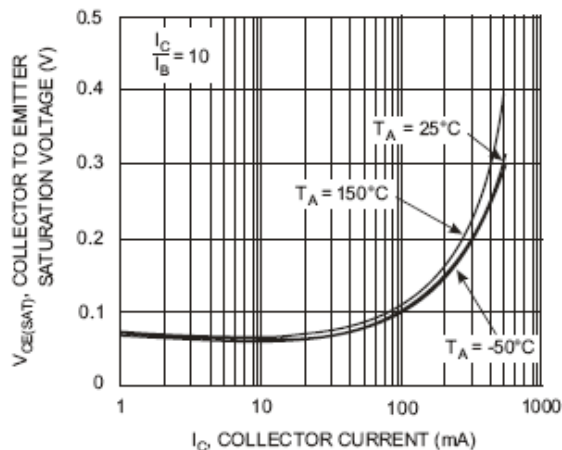


Fig. 5 Collector Emitter Saturation Voltage vs. Collector Current

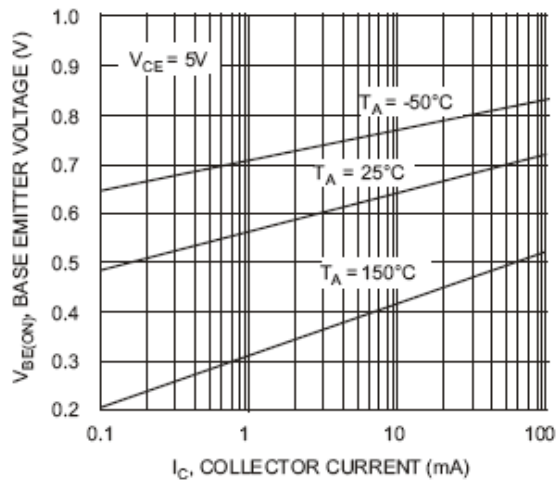


Fig. 6 Base Emitter Voltage vs. Collector Current



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## Ordering Information

Device	Packing
(Part Number)-TP	Tape&Reel;3Kpcs/Reel

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