

Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



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Micro Commercial Components

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# MMDT4401

## NPN Plastic-Encapsulate Transistors

### Features

- Halogen free available upon request by adding suffix "-HF"
- Lead Free Finish/RoHS Compliant ("P" Suffix designates RoHS Compliant. See ordering information)
- Ultra-Small Surface Mount Package
- Epitaxial Planar Die Construction
- Epoxy meets UL 94 V-0 flammability rating
- Moisture Sensitivity Level 1
- Marking:K2X

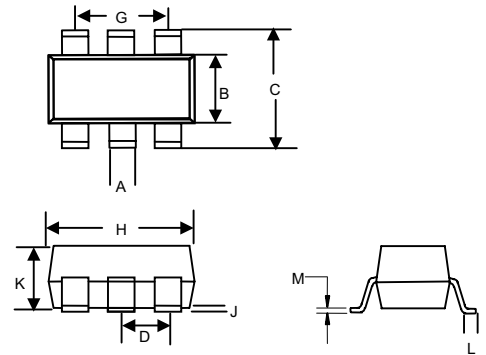
### Maximum Ratings @ 25°C Unless Otherwise Specified

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

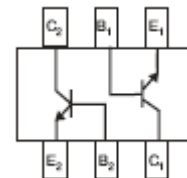
### Electrical Characteristics @ 25°C Unless Otherwise Specified

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)	20	---	---
	(I <sub>C</sub> =1mA, V <sub>CE</sub> =1Vdc)	40	---	
	(I <sub>C</sub> =10mA, V <sub>CE</sub> =1Vdc)	80	---	
	(I <sub>C</sub> =150mA, V <sub>CE</sub> =1Vdc)	100	300	
V <sub>CE(sat)</sub>	Collector-Emitter Saturation Voltage (I <sub>C</sub> =150mA, I <sub>B</sub> =15mA)	---	0.4	Vdc
	(I <sub>C</sub> =500mA, I <sub>B</sub> =50mA)	---	0.75	
V <sub>BE(sat)</sub>	Base-Emitter Saturation Voltage (I <sub>C</sub> =150mA, I <sub>B</sub> =15mA)	0.75	0.95	Vdc
	(I <sub>C</sub> =500mA, I <sub>B</sub> =50mA)	---	1.2	
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,		---
t <sub>r</sub>	Rise Time	V <sub>BE</sub> =2.00V, I <sub>B1</sub> =15.00mA		15 ns
t <sub>s</sub>	Storage Time	V <sub>CC</sub> =30V, I <sub>C</sub> =150mA,		---
t <sub>f</sub>	Fall Time	I <sub>B1</sub> =-I <sub>B2</sub> =15mA		225 ns
		---	30	ns

### SOT-363



DIM	DIMENSIONS				NOTE
	INCHES		MM		
	MIN	MAX	MIN	MAX	
A	.006	.014	0.15	0.35	
B	.045	.053	1.15	1.35	
C	.085	.096	2.15	2.45	
D	.026		0.65Nominal		
G	.047	.055	1.20	1.40	
H	.071	.087	1.80	2.20	
J	---	.004	---	0.10	
K	.035	.043	0.90	1.10	
L	.010	.018	0.26	0.46	
M	.003	.006	0.08	0.15	



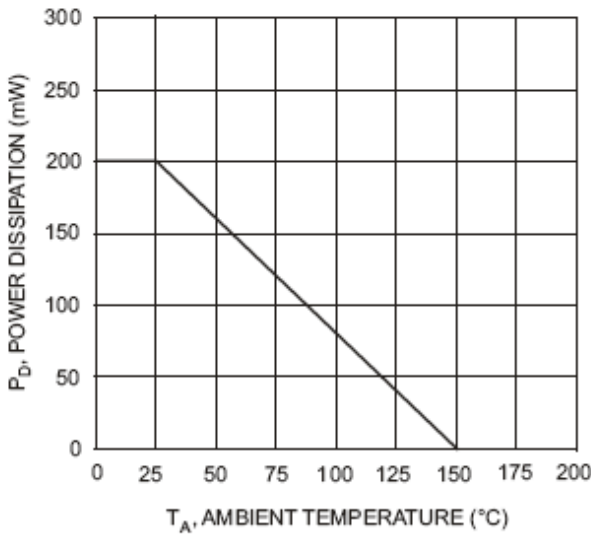


Fig. 1 Max Power Dissipation vs Ambient Temperature

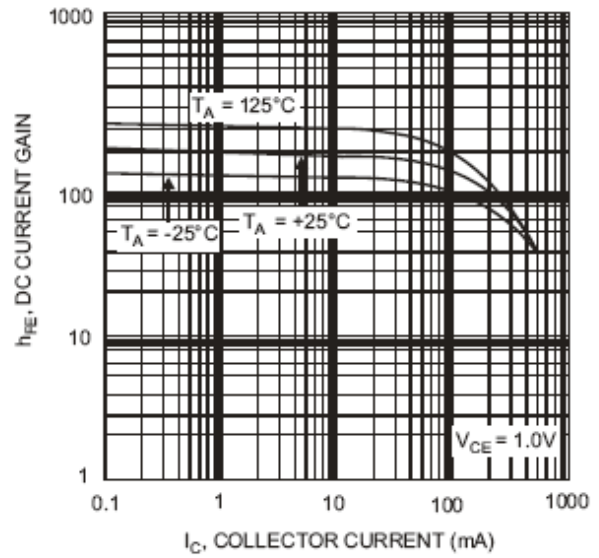


Fig. 2 Typical DC Current Gain vs Collector Current

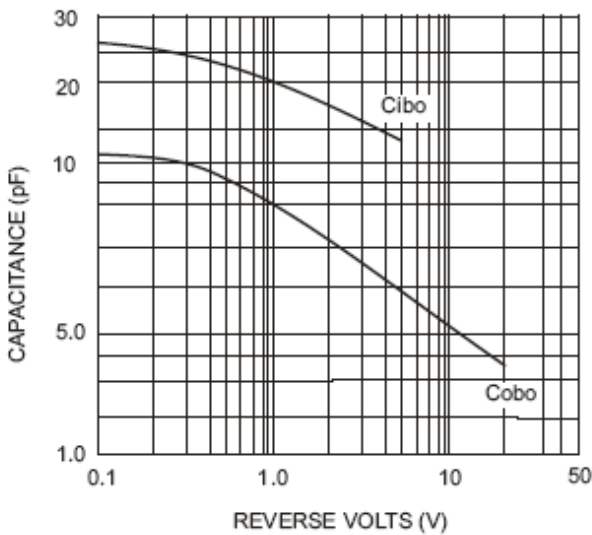


Fig. 3 Typical Capacitance

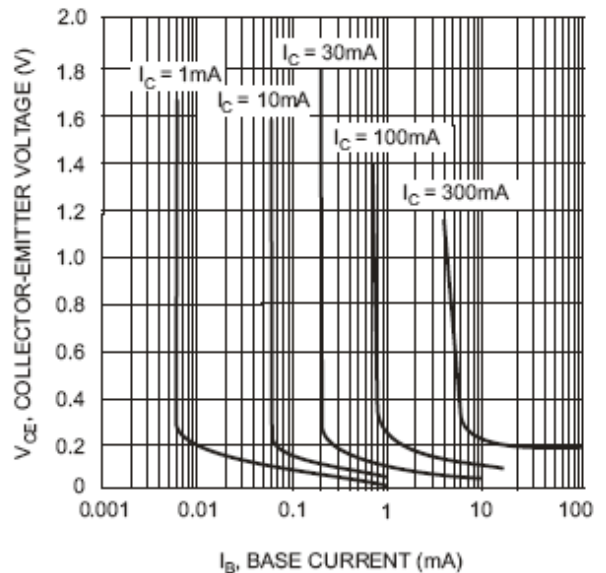


Fig. 4 Typical Collector Saturation Region

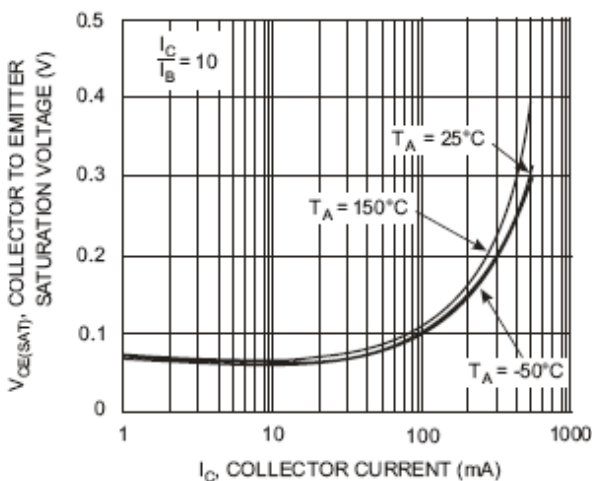


Fig. 5 Collector Emitter Saturation Voltage vs. Collector Current

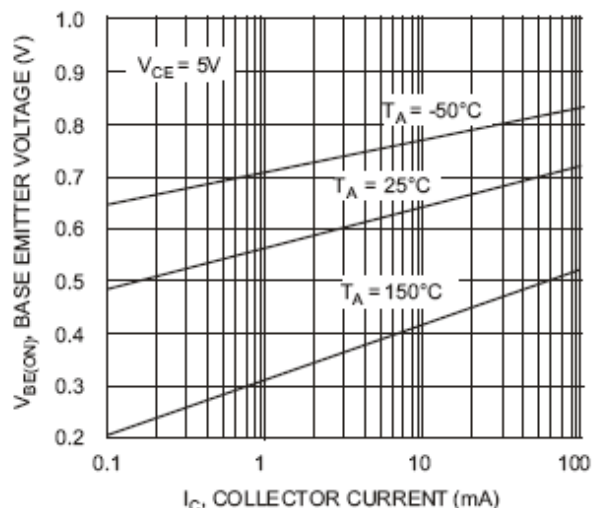


Fig. 6 Base Emitter Voltage vs. Collector Current



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### Ordering Information :

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

Note : Adding "-HF" suffix for halogen free, eg. Part Number-TP-HF

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