



Micro Commercial Components



Micro Commercial Components  
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# MMDT2222A

## Features

- Halogen free available upon request by adding suffix "-HF"
- Lead Free Finish/RoHS Compliant ("P" Suffix designates RoHS Compliant. See ordering information)
- Epitaxial Die Construction
- Small Surface Mount Package
- Marking:K1P
- Epoxy meets UL 94 V-0 flammability rating
- Moisture Sensitivity Level 1

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

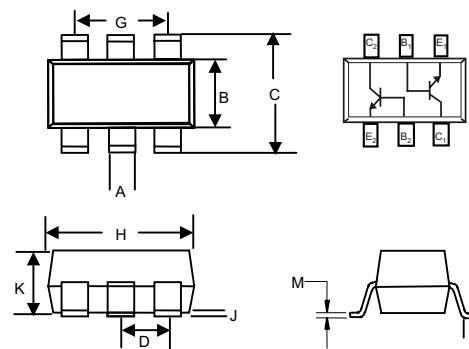
Symbol	Rating	Rating	Unit
V <sub>CEO</sub>	Collector-Emitter Voltage	40	V
V <sub>CBO</sub>	Collector-Base Voltage	75	V
V <sub>EBO</sub>	Emitter-Base Voltage	6	V
I <sub>C</sub>	Collector Current-Continuous	0.6	A
P <sub>C</sub>	Collector Dissipation	0.15	W
R <sub>θJA</sub>	Thermal Resistance Junction to Ambient	833	°C/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	Typ	Max	Units
V <sub>(BR)CEO</sub>	Collector-Emitter Breakdown Voltage (I <sub>C</sub> =10mAdc, I <sub>B</sub> =0)	40	---	---	Vdc
V <sub>(BR)CBO</sub>	Collector-Base Breakdown Voltage (I <sub>C</sub> =10uAdc, I <sub>E</sub> =0)	75	---	---	Vdc
V <sub>(BR)EBO</sub>	Collector-Emitter Breakdown Voltage (I <sub>E</sub> =10uAdc, I <sub>C</sub> =0)	6	---	---	Vdc
I <sub>CBO</sub>	Collector Cutoff Current (V <sub>CB</sub> =60Vdc, I <sub>E</sub> =0Vdc)	---	---	10	nAdc
I <sub>CEX</sub>	Collector Cutoff Current (V <sub>CE</sub> =60Vdc, V <sub>EB(OFF)</sub> =3Vdc)	---	---	10	nAdc
I <sub>EBO</sub>	Emitter Cutoff Current (V <sub>EB</sub> =3Vdc, I <sub>C</sub> =0Vdc)	---	---	10	nAdc
I <sub>BL</sub>	Base Cutoff Current (V <sub>CE</sub> =60Vdc, V <sub>EB(OFF)</sub> =3Vdc)	---	---	20	nAdc
h <sub>FE</sub>	DC Current Gain (I <sub>C</sub> =0.1mAdc, V <sub>CE</sub> =10Vdc) (I <sub>C</sub> =1mAdc, V <sub>CE</sub> =10Vdc) (I <sub>C</sub> =10mAdc, V <sub>CE</sub> =10Vdc) (I <sub>C</sub> =150mAdc, V <sub>CE</sub> =10Vdc) (I <sub>C</sub> =500mAdc, V <sub>CE</sub> =10Vdc) (I <sub>C</sub> =150mAdc, V <sub>CE</sub> =1Vdc)	35 50 75 100 40 35	---	---	---
V <sub>CE(sat)</sub>	Collector-Emitter Saturation Voltage (I <sub>C</sub> =150mAdc, I <sub>B</sub> =15mAdc) (I <sub>C</sub> =500mAdc, I <sub>B</sub> =50mAdc)	---	---	0.3 1.0	Vdc
V <sub>BE(sat)</sub>	Base-Emitter Saturation Voltage (I <sub>C</sub> =150mAdc, I <sub>B</sub> =15mAdc) (I <sub>C</sub> =500mAdc, I <sub>B</sub> =50mAdc)	0.6 ---	---	1.2 2.0	Vdc

## NPN Plastic-Encapsulate Transistors

### 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	

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## Electrical Characteristics @ 25°C Unless Otherwise Specified

Symbol	Parameter	Min	Typ	Max	Units	
$f_T$	Transition Frequency ( $V_{CE}=20V_{dc}$ , $I_C=20mA_{dc}$ , $f=100MHz$ )	300	---	---	MHz	
$C_{ob}$	Output Capacitance ( $V_{CB}=10V_{dc}$ , $f=1.0MHz$ , $I_E=0$ )	---	---	8	pF	
NF	Noise Figure ( $V_{CE}=10V$ , $I_C=0.1mA$ , $f=1KHz$ , $R_S=1k\Omega$ , $BW=200Hz$ )	---	---	4	dB	
$t_d$	Delay Time	$V_{CC}=30V$ , $I_C=150mA$ , $V_{BE(off)}=-0.5V$ , $I_{B1}=15mA$		---	10	ns
$t_r$	Rise Time	$V_{CC}=30V$ , $I_C=150mA$ , $I_{B1}=I_{B2}=15mA$		---	25	ns
$t_s$	Storage Time	$V_{CC}=30V$ , $I_C=150mA$ , $I_{B1}=I_{B2}=15mA$		---	225	ns
$t_f$	Fall Time	$V_{CC}=30V$ , $I_C=150mA$ , $I_{B1}=I_{B2}=15mA$		---	60	ns

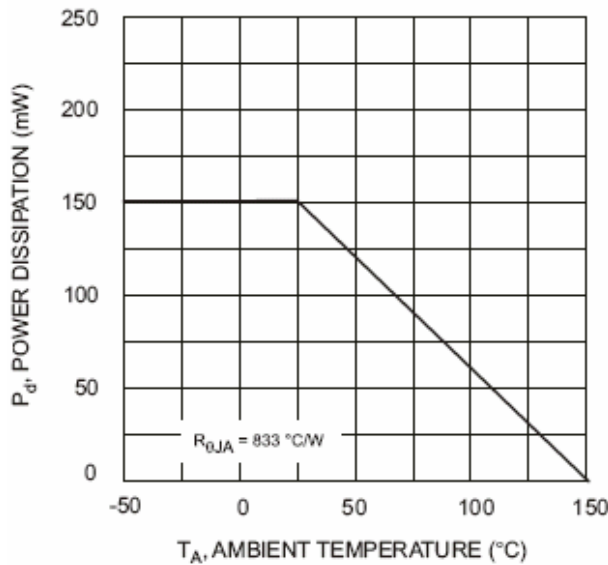


Fig. 1, Derating Curve - Total

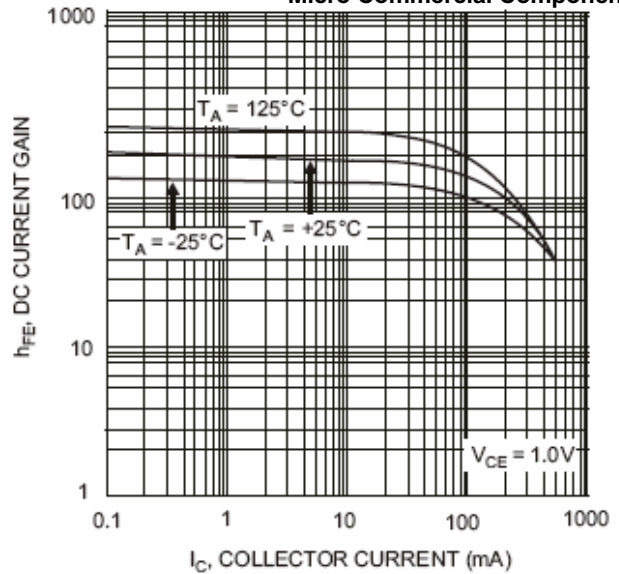


Fig. 2 Typical DC Current Gain vs Collector Current

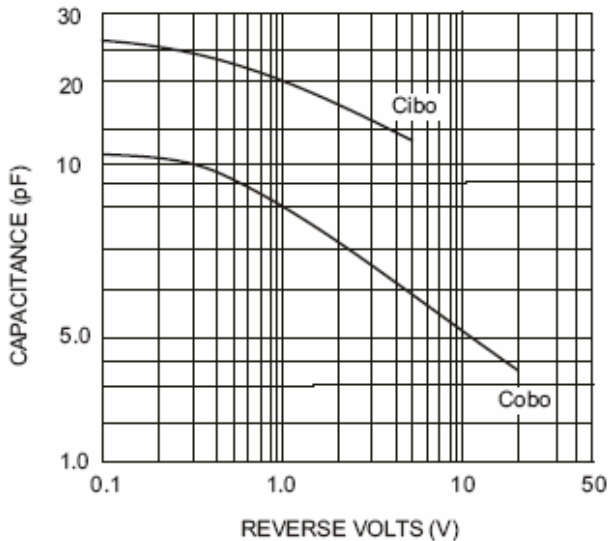


Fig. 3 Typical Capacitance

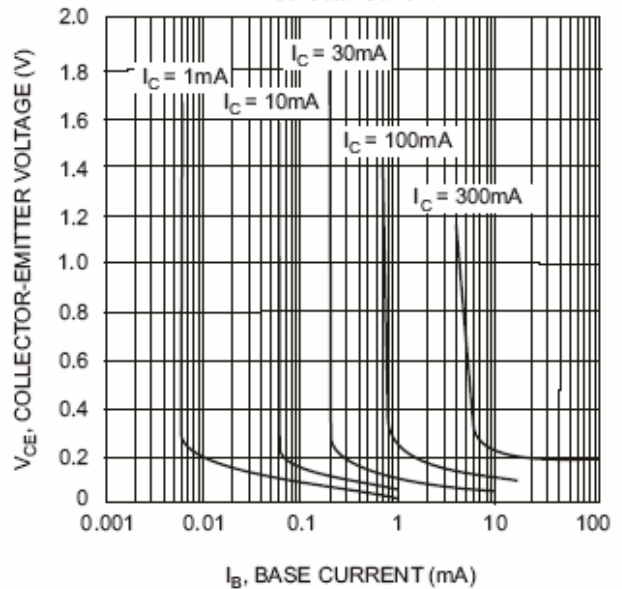


Fig. 4 Typical Collector Saturation Region

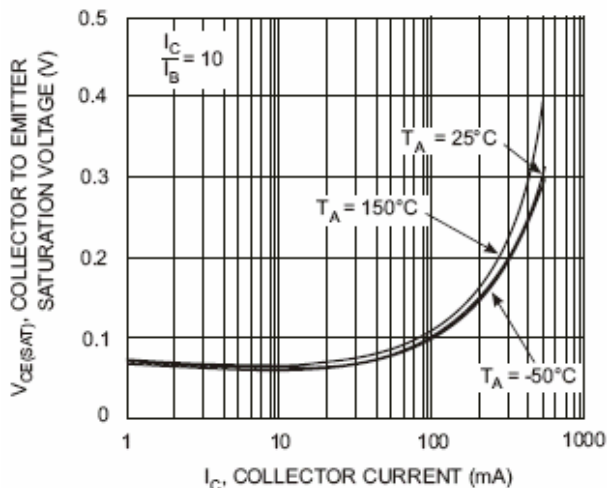


Fig. 5 Collector Emitter Saturation Voltage vs. Collector Current

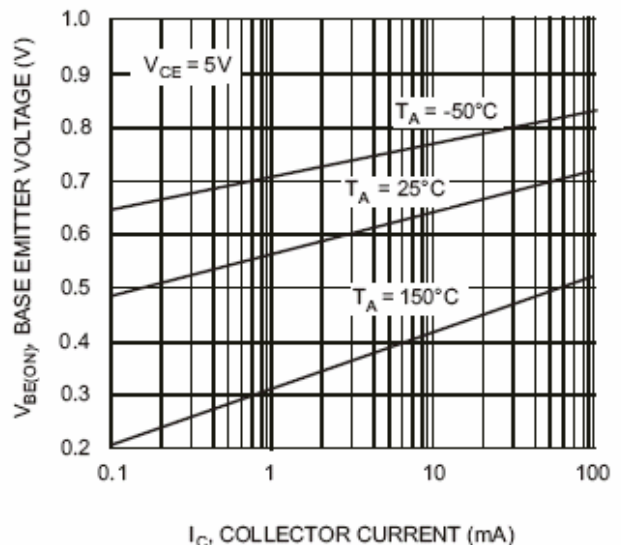


Fig. 6 Base Emitter Voltage vs. Collector Current

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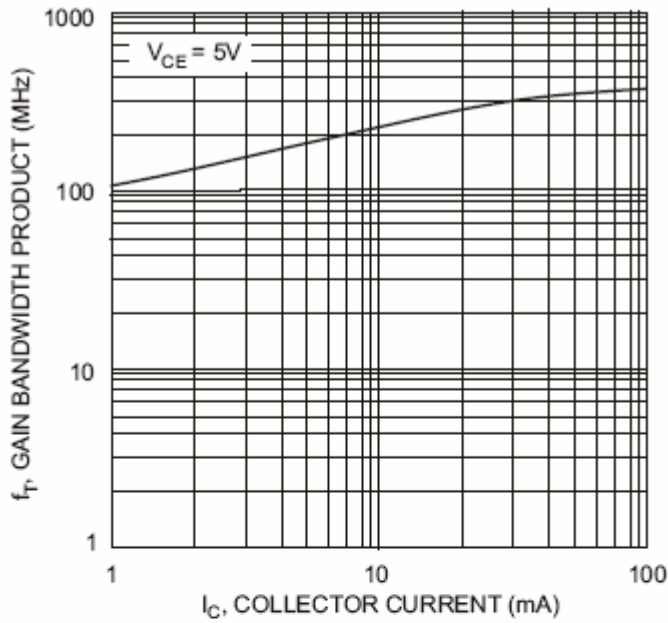


Fig. 7 Gain Bandwidth Product vs. Collector Current



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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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