



Micro Commercial Components

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 20736 Marilla Street Chatsworth  
 CA 91311  
 Phone: (818) 701-4933  
 Fax: (818) 701-4939

# MMDT2222A

## Features

- Epitaxial Die Construction
- Small Surface Mount Package
- Marking:K1P
- Case Material:Molded Plastic. UL Flammability Classificatio Rating 94-0 and MSL Rating 1

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

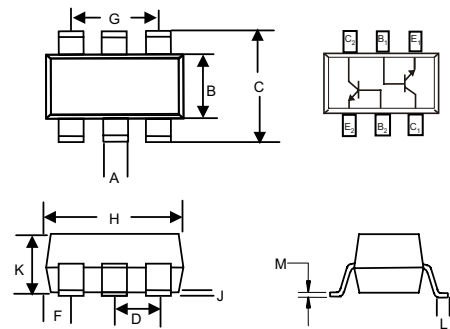
Symbol	Rating	Rating	Unit
V <sub>CEO</sub>	Collector-Emitter Voltage	40	V
V <sub>CBO</sub>	Collector-Base Voltage	75	V
V <sub>EBO</sub>	Emitter-Base Voltage	6	V
I <sub>C</sub>	Collector Current-Continuous	0.6	A
P <sub>C</sub>	Collector Dissipation	0.15	W
R <sub>θJA</sub>	Thermal Resistance Junction to 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> =10mA, 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> =0.1mA, V <sub>CE</sub> =10Vdc) (I <sub>C</sub> =1mA, V <sub>CE</sub> =10Vdc) (I <sub>C</sub> =10mA, V <sub>CE</sub> =10Vdc) (I <sub>C</sub> =150mA, V <sub>CE</sub> =10Vdc) (I <sub>C</sub> =500mA, V <sub>CE</sub> =10Vdc) (I <sub>C</sub> =150mA, V <sub>CE</sub> =1Vdc)	35 50 75 100 40 35	---	---	---
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)	---	---	0.3 1.0	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)	0.6 ---	---	1.2 2.0	Vdc

## NPN Plastic-Encapsulate Transistors

### SOT-363



DIM	DIMENSIONS				NOTE
	INCHES		MM		
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	

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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	$V_{CC}=30V$ , $I_C=150mA$ , $I_{B1}=15mA$		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

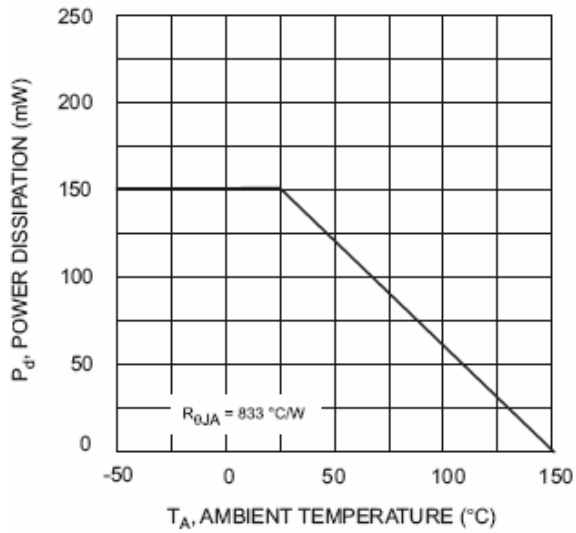


Fig. 1, Derating Curve - Total

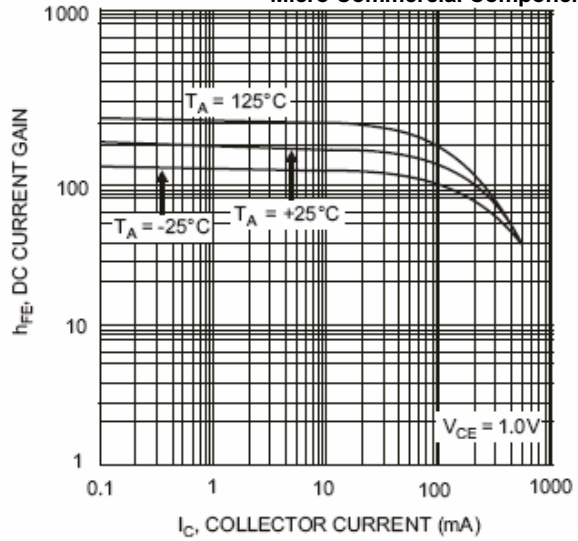


Fig. 2 Typical DC Current Gain vs. Collector Current

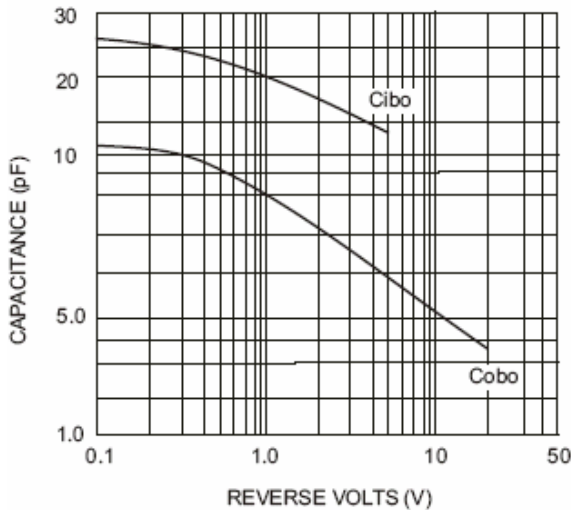


Fig. 3 Typical Capacitance

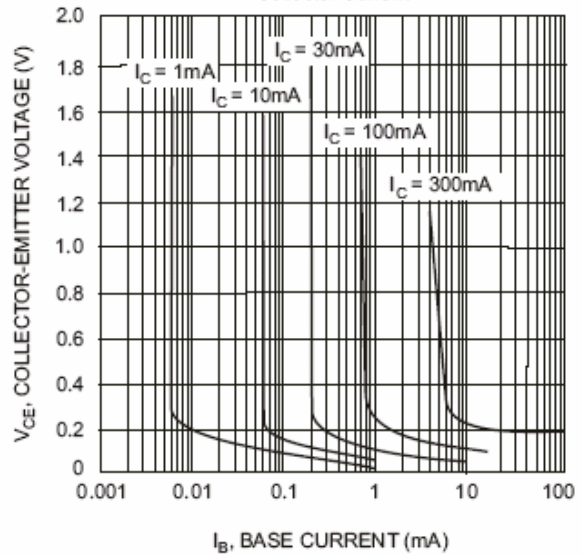


Fig. 4 Typical Collector Saturation Region

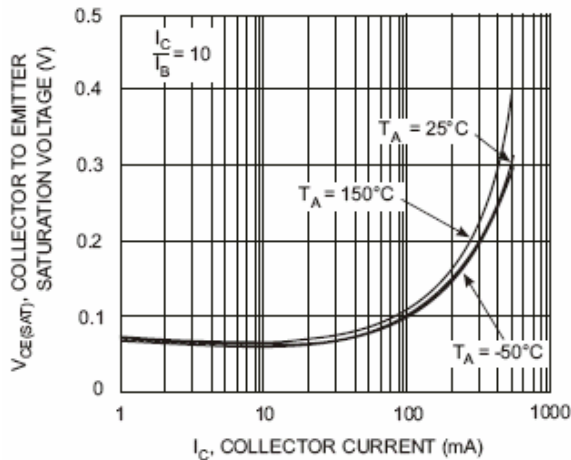


Fig. 5 Collector Emitter Saturation Voltage vs. Collector Current

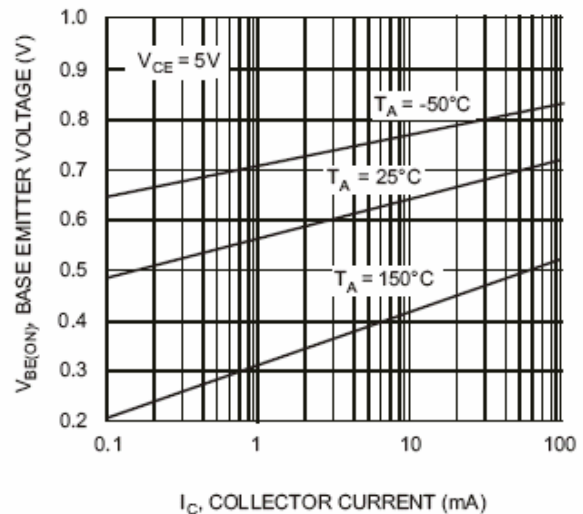
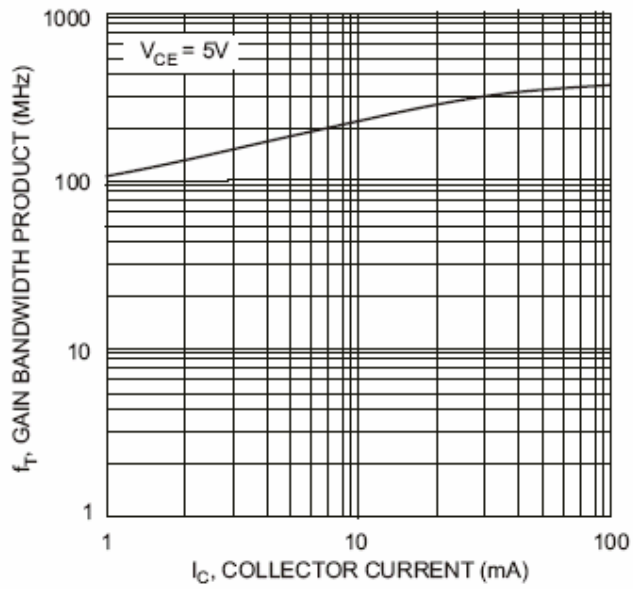


Fig. 6 Base Emitter Voltage vs. Collector Current

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## Ordering Information

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

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