

**Features**

- Complementary NPN Type Available MMDT2222A
- Halogen Free. "Green" Device (Note 1)
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

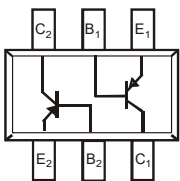
**Maximum Ratings @ 25°C Unless Otherwise Specified**

- Operating Junction Temperature Range: -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C

Parameter	Symbol	Rating	Unit
Collector-Base Voltage	$V_{CBO}$	-60	V
Collector-Emitter Voltage	$V_{CEO}$	-60	V
Emitter-Base Voltage	$V_{EBO}$	-5	V
Collector Current	$I_C$	-600	mA
Collector Power Dissipation	$P_C$	200	mW

Note: 1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

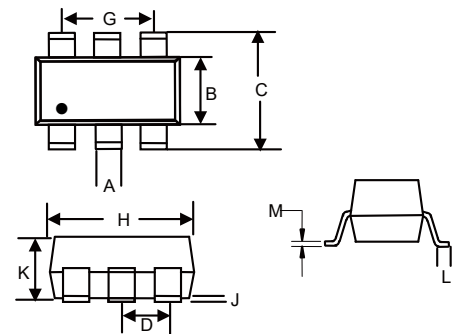
**Internal Structure**



**Marking: K2F**

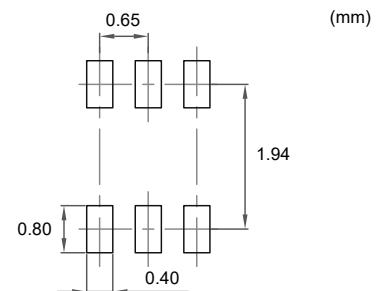
**PNP  
Plastic Encapsulate  
Transistors**

**SOT-363**



DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.006	0.014	0.15	0.35	
B	0.045	0.053	1.15	1.35	
C	0.079	0.096	2.00	2.45	
D	0.026		0.65		TYP.
G	0.047	0.055	1.20	1.40	
H	0.071	0.087	1.80	2.20	
J	----	0.004	----	0.10	
K	0.031	0.043	0.80	1.10	
L	0.010	0.018	0.26	0.46	
M	0.003	0.006	0.08	0.15	

**Suggested Solder Pad Layout**



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

Parameter	Symbol	Min	Typ	Max	Units	Conditions
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	-60			V	$I_C = -10\mu A, I_E = 0$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	-60			V	$I_C = -10mA, I_B = 0$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	-5			V	$I_E = -10\mu A, I_C = 0$
Collector-Base Cutoff Current	$I_{CBO}$			-10	nA	$V_{CB} = -50V, I_E = 0$
Collector Cutoff Current	$I_{CEX}$			-50	nA	$V_{CE} = -30V, V_{BE} = 0.5V$
Emitter-Base Cutoff Current	$I_{EBO}$			-10	nA	$V_{EB} = -5V, I_C = 0$
DC Current Gain <sup>(Note2)</sup>	$h_{FE(1)}$	75				$V_{CE} = -10V, I_C = -0.1mA$
	$h_{FE(2)}$	100				$V_{CE} = -10V, I_C = -1mA$
	$h_{FE(3)}$	100				$V_{CE} = -10V, I_C = -10mA$
	$h_{FE(4)}$	100		300		$V_{CE} = -10V, I_C = -150mA$
	$h_{FE(5)}$	50				$V_{CE} = -10V, I_C = -500mA$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$			-0.4	V	$I_C = -150mA, I_B = -15mA$
				-1.6	V	$I_C = -500mA, I_B = -50mA$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$			-1.3	V	$I_C = -150mA, I_B = -15mA$
				-2.6	V	$I_C = -500mA, I_B = -50mA$
Transition Frequency	$f_T$	200			MHz	$V_{CE} = -20V, I_C = -50mA, f = 100MHz$
Output Capacitance	$C_{cbo}$			8	pF	$V_{CB} = -10V, I_E = 0, f = 1MHz,$
Input Capacitance	$C_{ibo}$			30	pF	$V_{EB} = -2V, I_C = 0, f = 1MHz,$
Delay Time	$t_d$			10	ns	$V_{CC} = -3V, I_C = -150mA$
Rise Time	$t_r$			40	ns	$I_{B1} = -15mA$
Storage Time	$t_s$			225	ns	$V_{CC} = -3V, I_C = -150mA$
Fall Time	$t_f$			60	ns	$I_{B1} = I_{B2} = -15mA$

 Note: 2. Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2.0\%$

**Curve Characteristics**

Fig. 1 - Static Characteristics

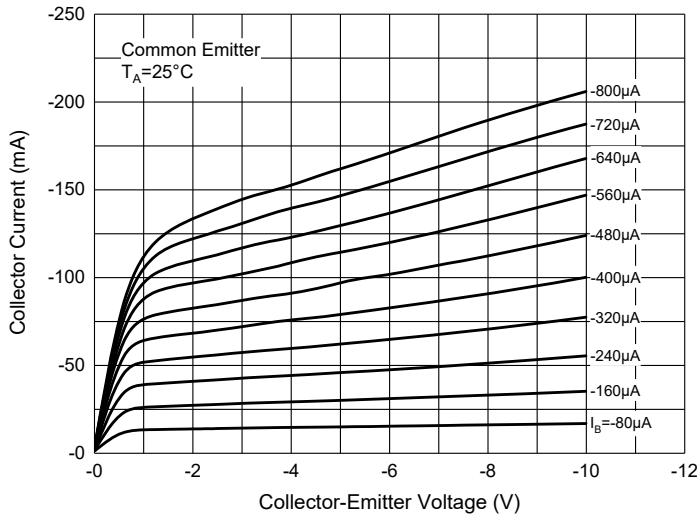


Fig. 2 - DC Current Gain Characteristics

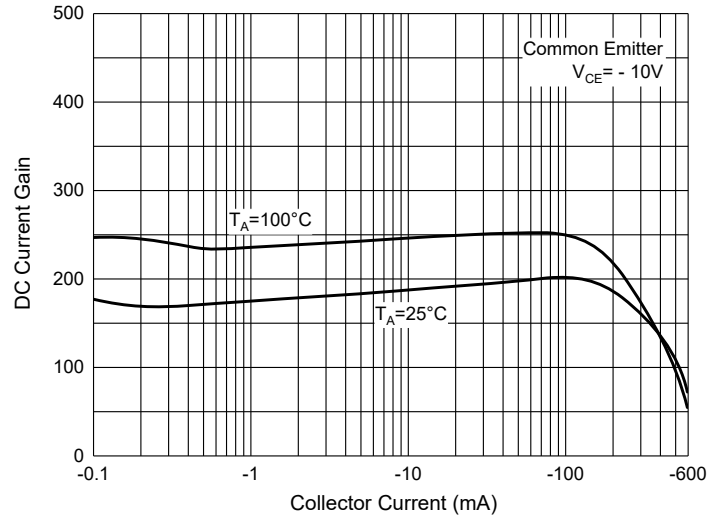


Fig. 3 - Collector-Emitter Saturation Voltage Characteristics

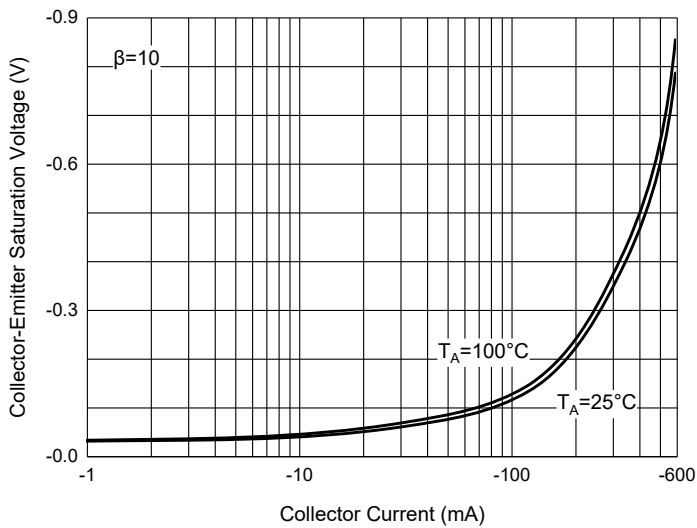


Fig. 4 - Base-Emitter Saturation Voltage Characteristics

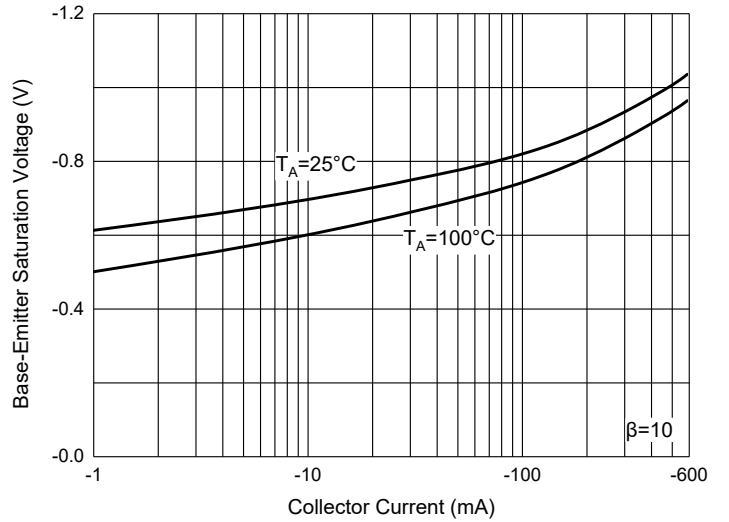


Fig. 5 - Base-Emitter Voltage Characteristics

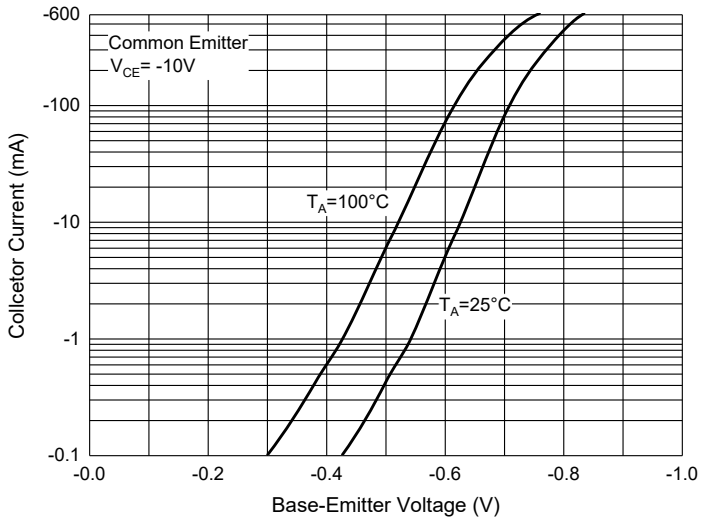
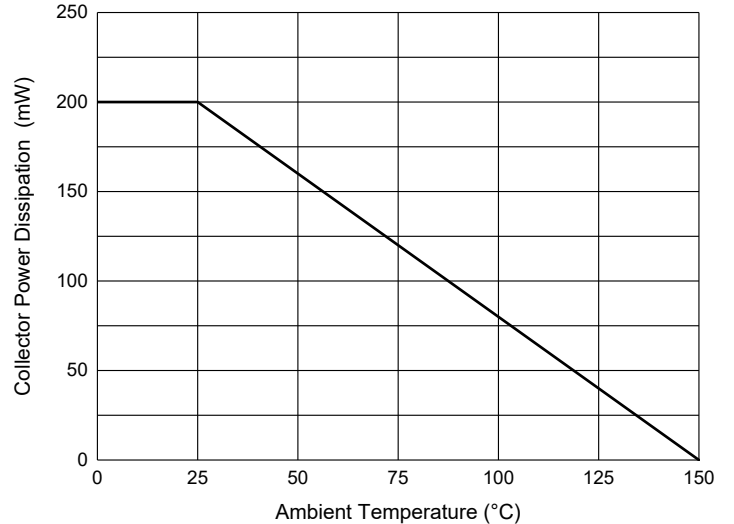


Fig. 6 - Collector Power Derating Curve



## Ordering Information

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

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