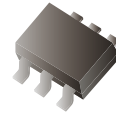


MMDT3906-HF (PNP+PNP)

RoHS Device
Halogen Free



Features

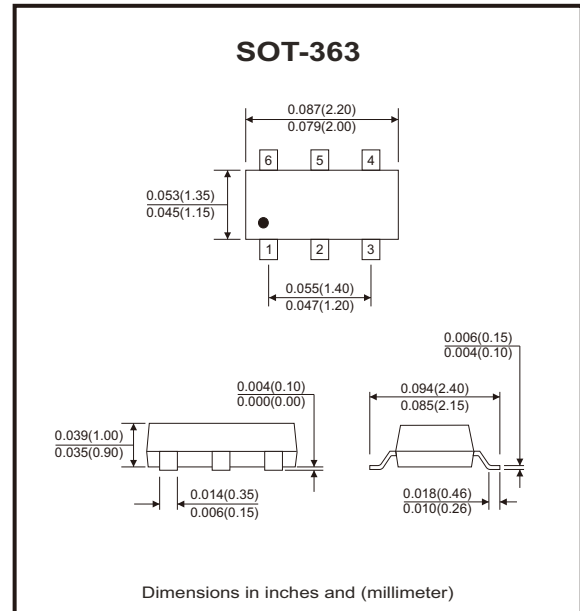
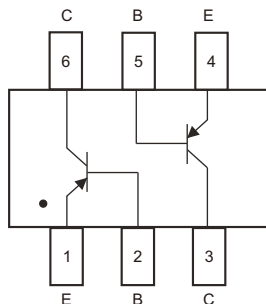
- Epitaxial planar die construction.
- Ideal for low power amplification and switching.
- High stability and high reliability.

Mechanical data

- Case: SOT-363 small outline plastic package.
- Epoxy UL: 94V-0.
- Mounting position: Any.

Circuit Diagram

- 1,4 : Emitter
- 2,5 : Base
- 3,6 : Collector



Maximum Ratings (at $T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Collector-base voltage	V_{CBO}	-40	V
Collector-emitter voltage	V_{CEO}	-40	V
Emitter-base voltage	V_{EBO}	-5	V
Collector current-continuous	I_C	-200	mA
Collector power dissipation	P_C	200	mW
Thermal resistance from junction to ambient	$R_{\theta JA}$	625	$^{\circ}\text{C/W}$
Junction temperature	T_J	150	$^{\circ}\text{C}$
Storage temperature range	T_{STG}	-55 to +150	$^{\circ}\text{C}$

Electrical Characteristics (at $T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Conditions	Symbol	Min	Max	Unit
Collector-base breakdown voltage	$I_C = -10\mu\text{A}, I_E = 0$	$V_{(BR)CBO}$	-40		V
Collector-emitter breakdown voltage	$I_C = -1\text{mA}, I_B = 0$	$V_{(BR)CEO}$	-40		V
Emitter-base breakdown voltage	$I_E = -10\mu\text{A}, I_C = 0$	$V_{(BR)EBO}$	-5		V
Collector cut-off current	$V_{CE} = -30\text{V}, V_{EB(off)} = -3\text{V}$	I_{CEX}		-50	nA
Base cut-off current	$V_{EB} = -5\text{V}, I_C = 0$	I_{EBO}		-50	nA
DC current gain	$V_{CE} = -1\text{V}, I_C = -0.1\text{mA}$	$h_{FE(1)}$	60		
	$V_{CE} = -1\text{V}, I_C = -1\text{mA}$	$h_{FE(2)}$	80		
	$V_{CE} = -1\text{V}, I_C = -10\text{mA}$	$h_{FE(3)}$	100	300	
	$V_{CE} = -1\text{V}, I_C = -50\text{mA}$	$h_{FE(4)}$	60		
	$V_{CE} = -1\text{V}, I_C = -100\text{mA}$	$h_{FE(5)}$	30		
Collector-emitter saturation voltage	$I_C = -10\text{mA}, I_B = -1\text{mA}$	$V_{CE(sat)1}$		-0.25	V
	$I_C = -50\text{mA}, I_B = -5\text{mA}$	$V_{CE(sat)2}$		-0.40	V
Base-emitter saturation voltage	$I_C = -10\text{mA}, I_B = -1\text{mA}$	$V_{BE(sat)1}$	-0.65	-0.85	V
	$I_C = -50\text{mA}, I_B = -5\text{mA}$	$V_{BE(sat)2}$		-0.95	V
Transition frequency	$V_{CE} = -20\text{V}, I_C = -10\text{mA}, f = 100\text{MHz}$	f_T	250		MHz
Collector output capacitance	$V_{CB} = -5\text{V}, I_E = 0, f = 1\text{MHz}$	C_{ob}		4.5	pF
Noise figure	$V_{EB} = -5\text{V}, I_E = 0, f = 1\text{MHz}$	NF		4	dB
Delay time	$V_{CC} = -3\text{V}, V_{BE(off)} = -0.5\text{V}$ $I_C = -10\text{mA}, I_{B1} = -1\text{mA}$	t_d		35	nS
Rise time		t_r		35	nS
Storage time		t_s		225	nS
Fall time	$I_{B1} = I_{B2} = -1\text{mA}$	t_f		75	nS

Note: Pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2.0\%$.

Typical Rating and Characteristic Curves (MMDT3906-HF)

Fig.1 - Static Characteristic

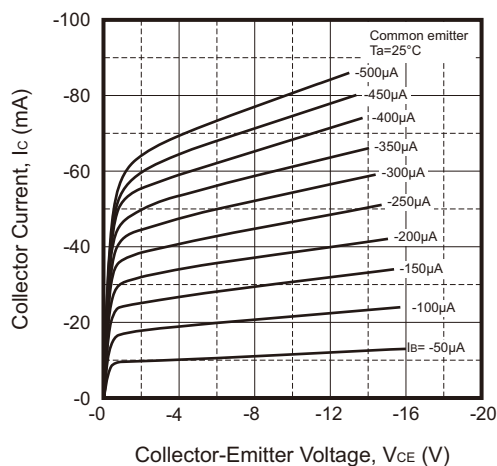
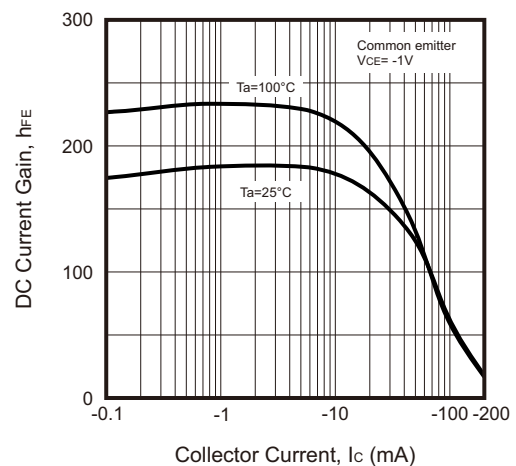


Fig.2 - $h_{FE} - I_C$



Typical Rating and Characteristic Curves (MMDT3906-HF)

Fig.3 - V_{CEsat} — I_c

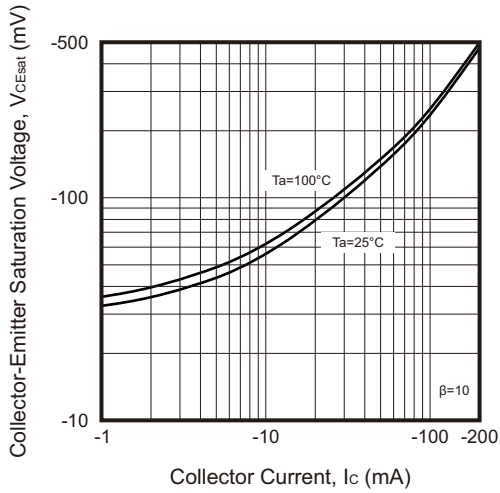


Fig.4 - V_{BEsat} — I_c

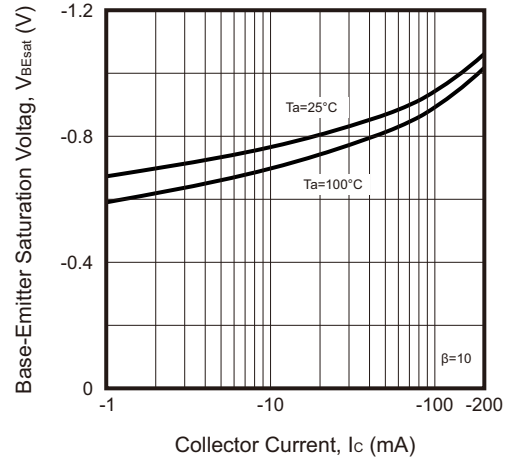


Fig.5 - I_c — V_{BE}

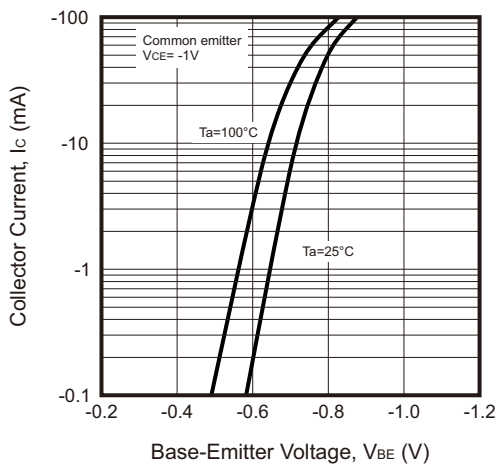


Fig.6 - C_{ob}/C_{ib} — V_{CB}/V_{EB}

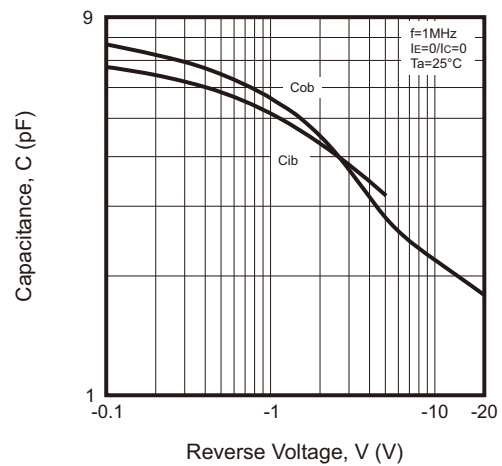


Fig.7 - f_T — I_c

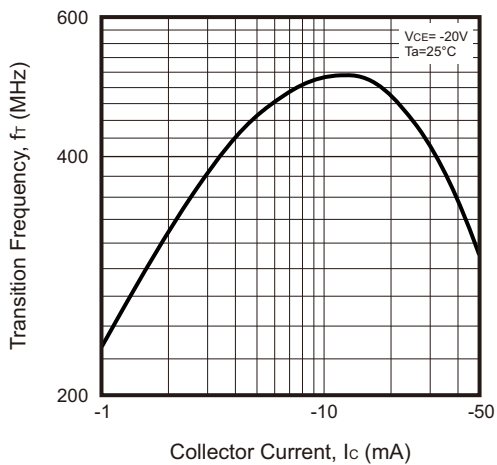
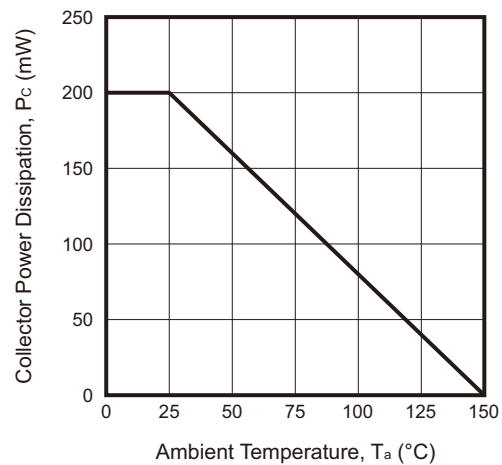
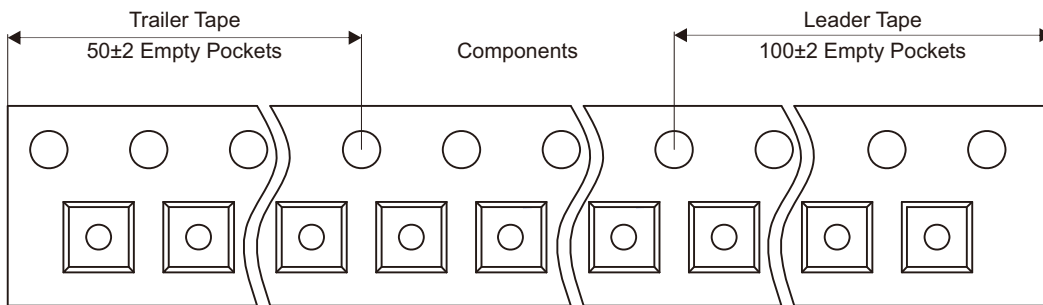
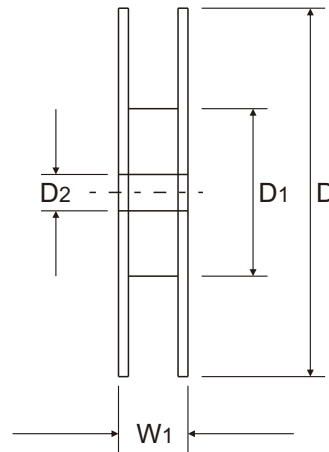
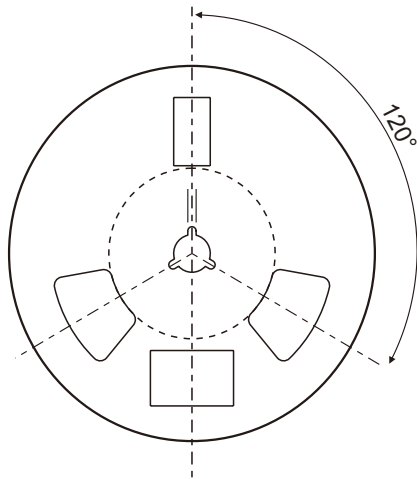
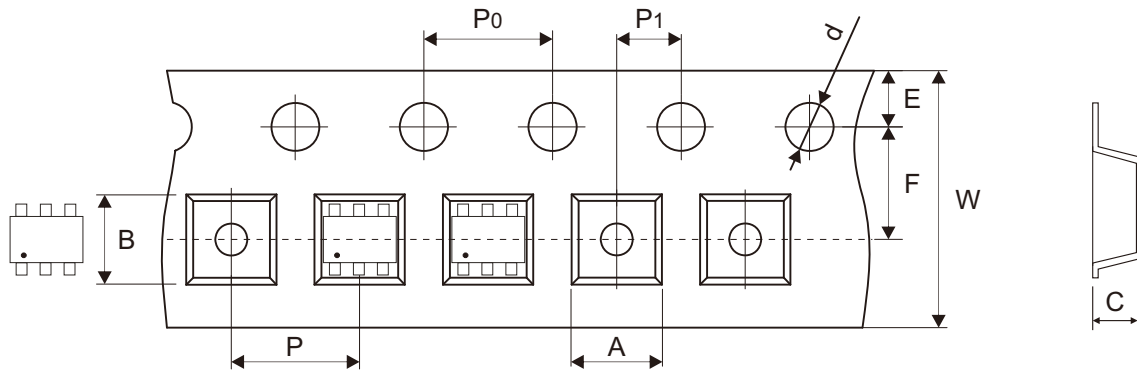


Fig.8 - P_c — T_a



Reel Taping Specification

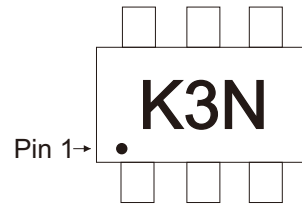


SOT-363	SYMBOL	A	B	C	d	D	D1	D2
	(mm)	2.25 ± 0.10	2.55 ± 0.10	1.20 ± 0.10	1.50 + 1.00 - 0.00	178.00 ± 2.00	54.40 ± 1.00	13.00 ± 1.00
	(inch)	0.089 ± 0.004	0.100 ± 0.004	0.047 ± 0.004	0.059 + 0.039 - 0.000	7.008 ± 0.079	2.142 ± 0.039	0.512 ± 0.039

SOT-363	SYMBOL	E	F	P	P0	P1	W	W1
	(mm)	1.75 ± 0.10	3.50 ± 0.05	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	8.00 + 0.30 - 0.10	12.30 ± 1.00
	(inch)	0.069 ± 0.004	0.138 ± 0.002	0.157 ± 0.004	0.157 ± 0.004	0.079 ± 0.002	0.315 + 0.012 - 0.004	0.484 ± 0.039

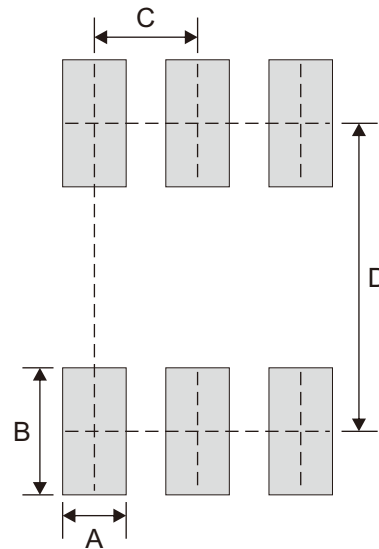
Marking Code

Part Number	Marking Code
MMDT3906-HF	K3N



Suggested P.C.B. PAD Layout

SIZE	SOT-363	
	(mm)	(inch)
A	0.40	0.016
B	0.80	0.031
C	0.65	0.026
D	1.94	0.076



Standard Packaging

Case Type	REEL PACK	
	REEL (pcs)	Reel Size (inch)
SOT-363	3,000	7