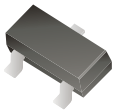
General Purpose Transistor

MMST2222A-HF (NPN)

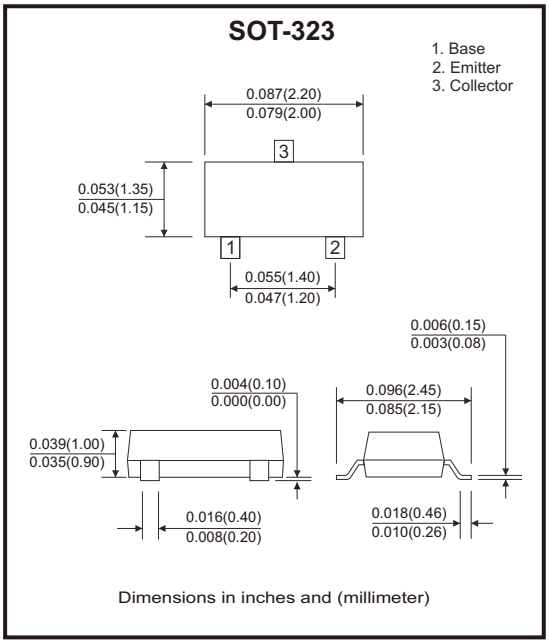
RoHS Device

Halogen Free



Features

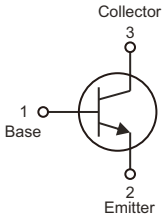
- Power dissipation of 200mW.
- High stability and high reliability.



Mechanical data

- Case: SOT-323, molded plastic.
- Epoxy UL: 94V-0.
- Mounting position: Any.

Circuit Diagram



Maximum Ratings (at Ta=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Collector-base voltage	V_{CBO}	75	V
Collector-emitter voltage	V_{CEO}	40	V
Emitter-base voltage	V_{EBO}	6	V
Collector current - continuous	I_C	600	mA
Collector power dissipation	P_C	200	mW
Junction temperature	T_J	150	°C
Storage temperature range	T_{STG}	-55 to +150	°C

Electrical Characteristics (at Ta=25°C unless otherwise noted)

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Collector-base breakdown voltage	I_C = 10μA, I_E = 0	$V_{(BR)CBO}$	75			V
Collector-emitter breakdown voltage	I_C = 10mA, I_B = 0	$V_{(BR)CEO}$	40			V
Emitter-base breakdown voltage	I_E = 10μA, I_C = 0	$V_{(BR)EBO}$	6			V
Collector cut-off current	V_{CB} = 70V, I_E = 0	I_{CBO}			100	nA
Collector cut-off current	V_{CE} = 35V, I_B = 0	I_{CEO}			100	nA
Emitter cut-off current	V_{EB} = 3V, I_C = 0	I_{EBO}			100	nA
DC current gain (Note 1)	V_{CE} = 10V, I_C = 150mA	$h_{FE(1)}$	100		300	
	V_{CE} = 10V, I_C = 0.1mA	$h_{FE(2)}$	35			
	V_{CE} = 10V, I_C = 10mA	$h_{FE(3)}$	75			
	V_{CE} = 10V, I_C = 500mA	$h_{FE(4)}$	40			
	V_{CE} = 1V, I_C = 150mA	$h_{FE(5)}$	35			
Collector-emitter saturation voltage (Note 1)	I_C = 500mA, I_B = 50mA I_C = 150mA, I_B = 15mA	$V_{CE(sat)}$			1.0 0.3	V
Base-emitter saturation voltage (Note 1)	I_C = 500mA, I_B = 50mA I_C = 150mA, I_B = 15mA	$V_{BE(sat)}$			2.0 1.2	V
Transition frequency	V_{CE} = 20V, I_C = 20mA, f = 100MHz	f_T	300			MHz
Output capacitance	V_{CB} = 10V, I_E = 0, f = 1MHz	C_{ob}			8	pF
Delay time	V_{CC} = 30V, $V_{BE(off)}$ = -0.5V I_C = 150mA, I_{B1} = 15mA	t_d			10	ns
Rise time		t_r			25	
Storage time	V_{CC} = 30V, I_C = 150mA I_{B1} = I_{B2} = 15mA	t_s			225	ns
Fall time		t_f			60	

Note: 1. Pulse width ≤ 300μs, duty cycle ≤ 2%.

Typical Rating and Characteristic Curves (MMST2222A-HF)

Fig.1 - Static Characteristic

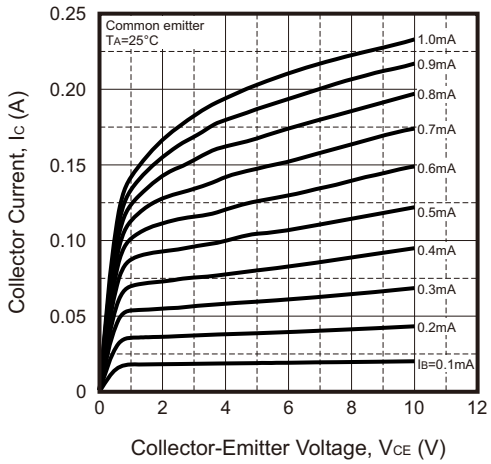
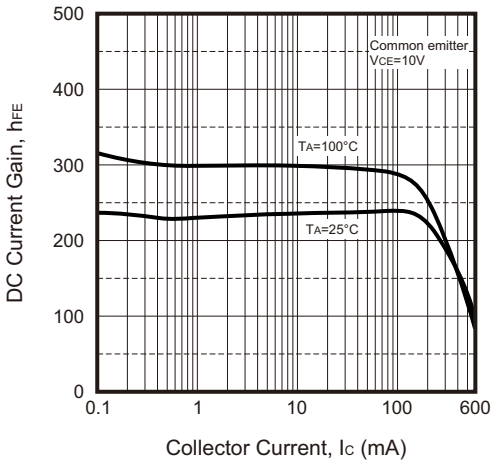


Fig.2 - h_{FE} — I_C



Typical Rating and Characteristic Curves (MMST2222A-HF)

Fig.3 - V_{CEsat} — I_C

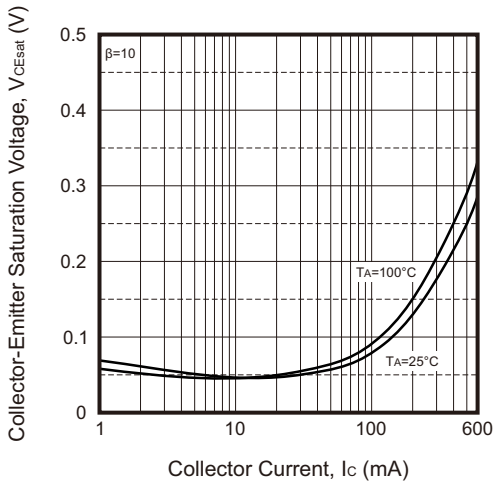


Fig.4 - V_{BEsat} — I_C

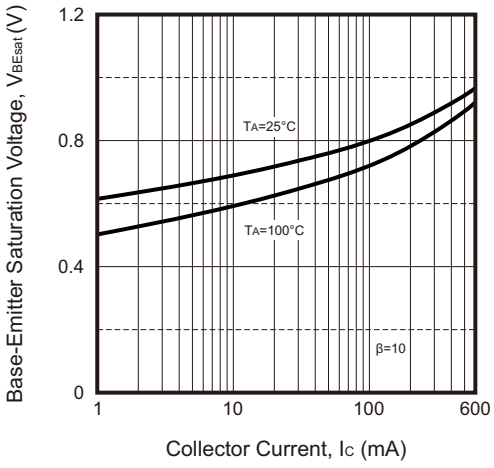


Fig.5 - I_C — V_{BE}

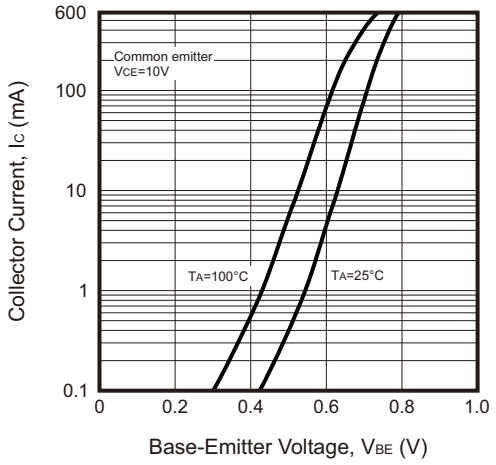


Fig.6 - Cob/Cib — V_{CB}/V_{EB}

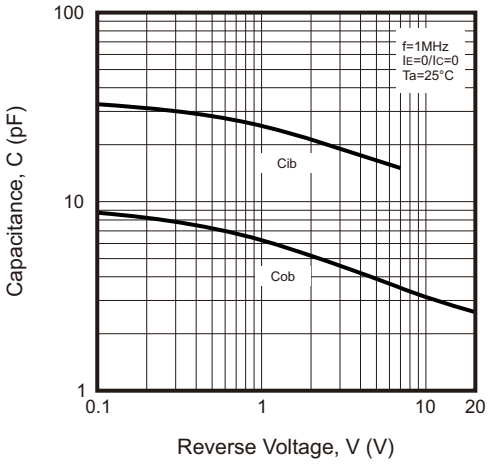


Fig.7 - f_T — I_C

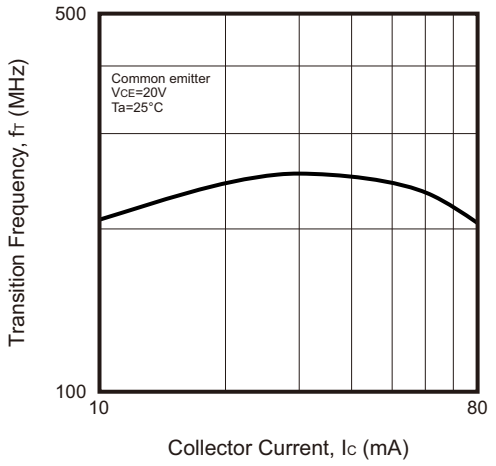
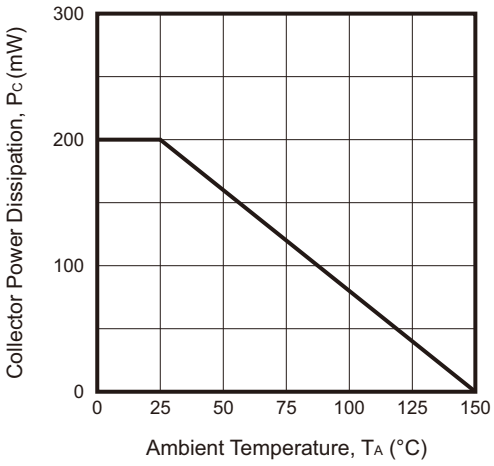
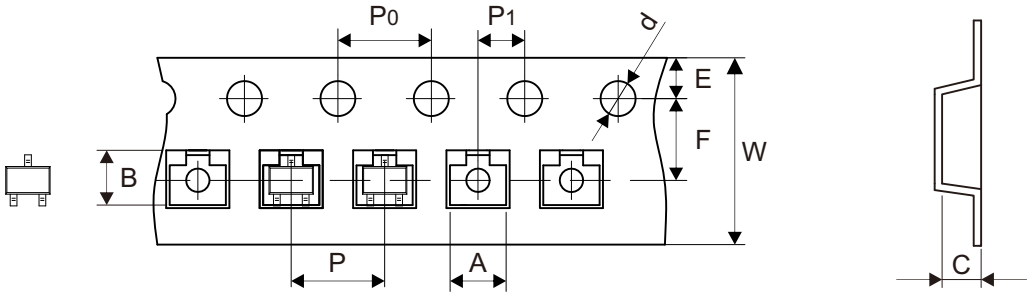
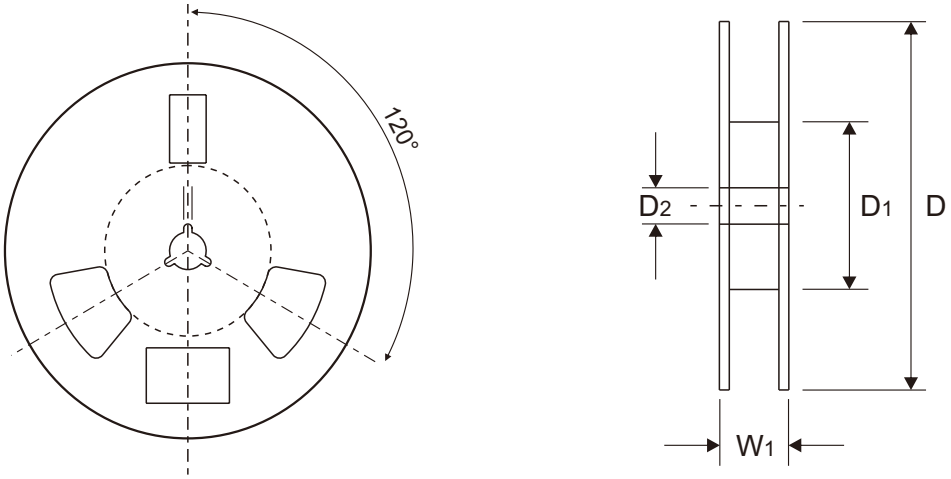


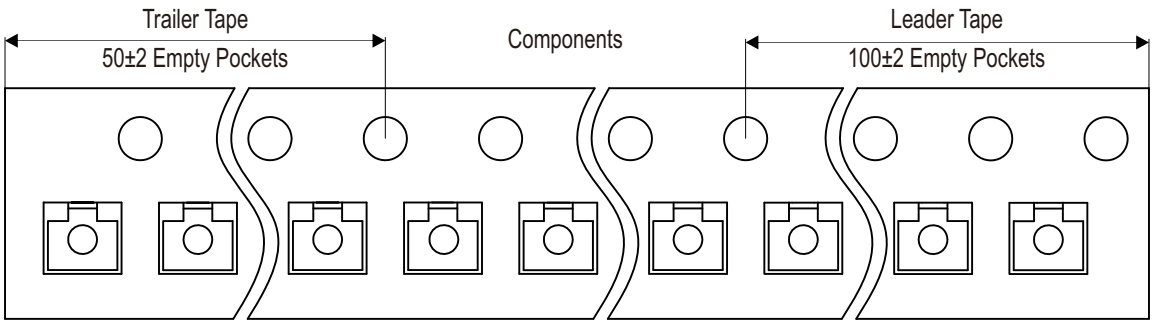
Fig.8 - P_C — T_a



Reel Taping Specification







	SYMBOL	A	B	C	d	D	D1	D2
SOT-323	(mm)	2.25 ± 0.10	2.55 ± 0.10	1.19 ± 0.10	1.50 + 0.50 − 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 + 0.020 − 0.000	7.008 ± 0.079	2.142 ± 0.039	0.512 ± 0.039

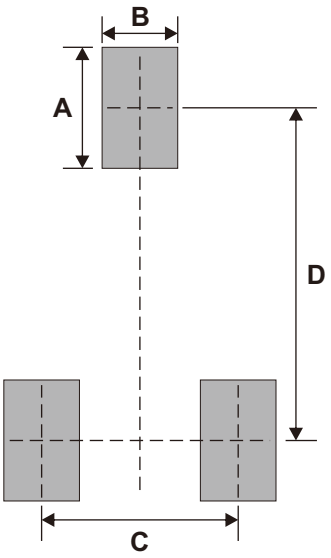
	SYMBOL	E	F	P	P0	P1	W	W1
SOT-323	(mm)	1.75 ± 0.10	3.50 ± 0.05	4.00 ± 0.20	4.00 ± 0.10	2.00 ± 0.10	8.00 + 0.30 − 0.10	12.30 ± 1.00
	(inch)	0.069 ± 0.004	0.138 ± 0.002	0.157 ± 0.008	0.157 ± 0.004	0.079 ± 0.004	0.315 + 0.012 − 0.004	0.484 ± 0.039

Marking Code

Part Number	Marking Code
MMST2222A-HF	K3P

Suggested P.C.B. PAD Layout

SIZE	SOT-323	
	(mm)	(inch)
A	0.80	0.031
B	0.50	0.020
C	1.30	0.051
D	2.20	0.087



Standard Packaging

Case Type	REEL PACK	
	REEL (pcs)	Reel Size (inch)
SOT-323	3,000	7