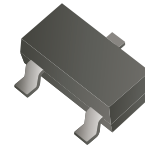


MMBT4403-P2-HF (PNP)

RoHS Device

Halogen Free



Features

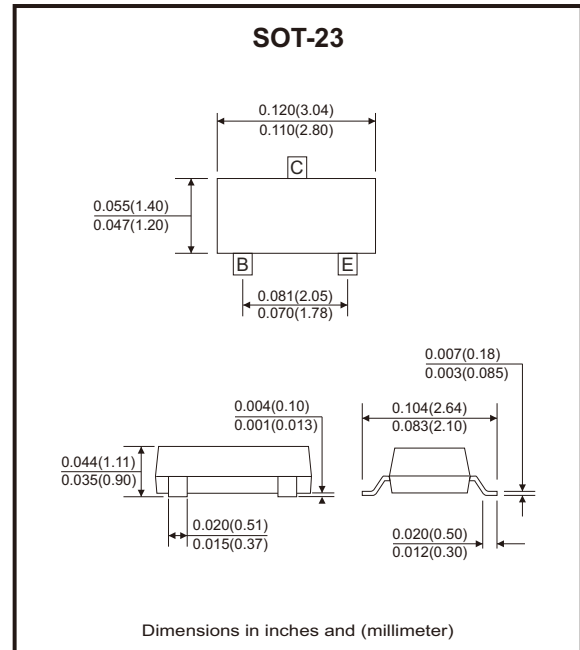
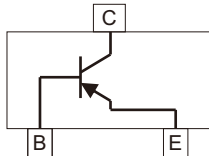
- Capable of 300mW of power dissipation.
- Surface mount SOT-23 package.

Mechanical data

- Case: SOT-23, molded plastic.
- Terminals: Solderable per MIL-STD-750, method 2026.
- Mounting position: Any.

Circuit Diagram

B: Base
E: Emitter
C: 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	I_C	-600	mA
Collector power dissipation (Note 1)	P_D	300	mW
Thermal resistance from junction to ambient	$R_{\theta JA}$	417	$^{\circ}\text{C/W}$
Junction temperature	T_J	150	$^{\circ}\text{C}$
Storage temperature range	T_{STG}	-55 to +150	$^{\circ}\text{C}$

Notes: 1. Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Collector-emitter breakdown voltage	V_{CEO}	$I_C = -1mA, I_B = 0$	-40			V
Collector-base breakdown voltage	V_{CBO}	$I_C = -100\mu A, I_E = 0$	-40			V
Emitter-base breakdown voltage	V_{EBO}	$I_E = -100\mu A, I_C = 0$	-5			V
Collector-base cut-off current	I_{CBO}	$V_{CB} = -35V, I_E = 0$			-100	nA
Collector cut-off current	I_{CEX}	$V_{CE} = -35V, V_{BE} = 0.4V$			-100	nA
Emitter-base cut-off current	I_{EBO}	$V_{EB} = -4V, I_C = 0$			-100	nA
DC current gain	$h_{FE(1)}$	$I_C = -0.1mA, V_{CE} = -1V$	30			
	$h_{FE(2)}$	$I_C = -1mA, V_{CE} = -1V$	60			
	$h_{FE(3)}$	$I_C = -10mA, V_{CE} = -1V$	100			
	$h_{FE(4)}$	$I_C = -150mA, V_{CE} = -2V$	100		300	
	$h_{FE(5)}$	$I_C = -500mA, V_{CE} = -2V$	20			
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = -150mA, I_B = -15mA$			-0.4	V
		$I_C = -500mA, I_B = -50mA$			-0.75	
Base-emitter saturation voltage	$V_{BE(sat)}$	$I_C = -150mA, I_B = -15mA$			-0.95	V
		$I_C = -500mA, I_B = -50mA$			-1.3	
Transition frequency	f_r	$I_C = -20mA, V_{CE} = -10V, f = 100MHz$	200			MHz
Collector-base capacitance	C_{cb}	$V_{CB} = -10V, I_E = 0, f = 1MHz$			8.5	pF
Emitter-base capacitance	C_{eb}	$V_{EB} = -0.5V, I_C = 0, f = 1MHz$			30	pF
Switching Characteristics						
Delay time	t_d	$V_{CC} = -3V, V_{BE} = -0.5V, I_C = -150mA$ $I_{B1} = -15mA$			15	ns
Rise time	t_r				20	ns
Storage time	t_s	$V_{CC} = -3V, I_C = -150mA, I_{B1} = I_{B2} = -15mA$			225	ns
Fall time	t_f				30	ns

Typical Rating and Characteristic Curves (MMBT4403-P2-HF)

Fig.1 - Static Characteristic

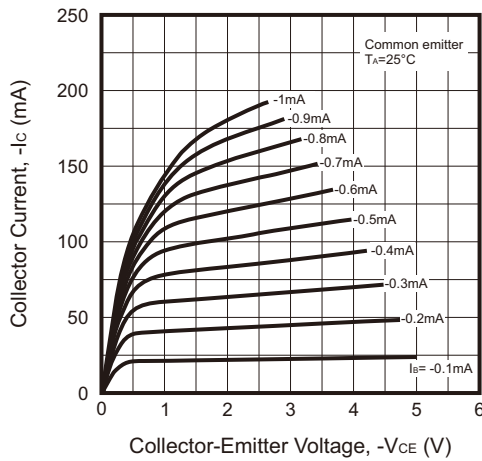


Fig.2 - DC Current Gain Characteristics

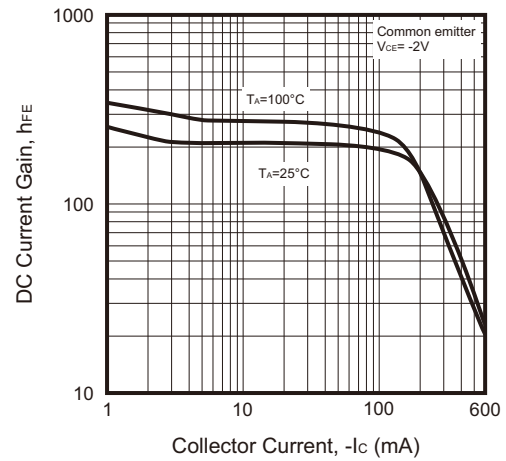


Fig.3 - Collector-Emitter Saturation Voltage Characteristics

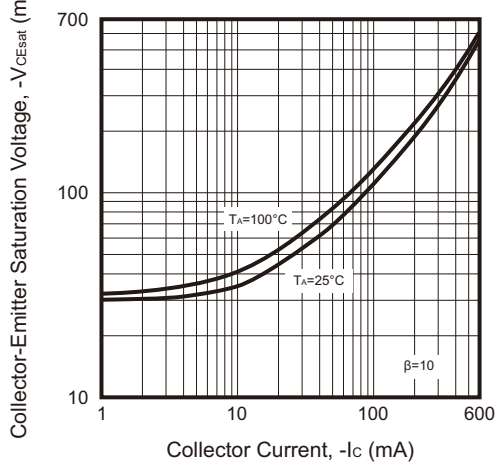


Fig.4 - Base-Emitter Saturation Voltage Characteristics

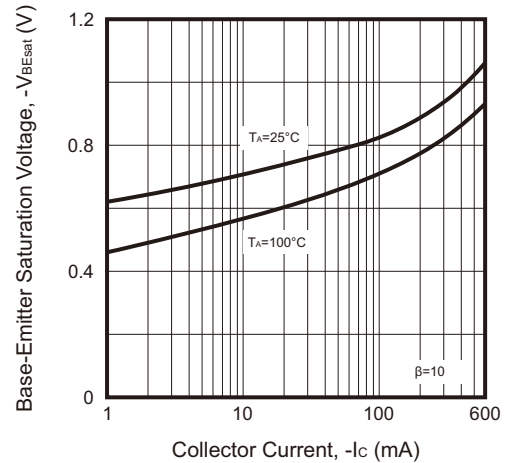


Fig.5 - Base-Emitter Voltage Characteristics

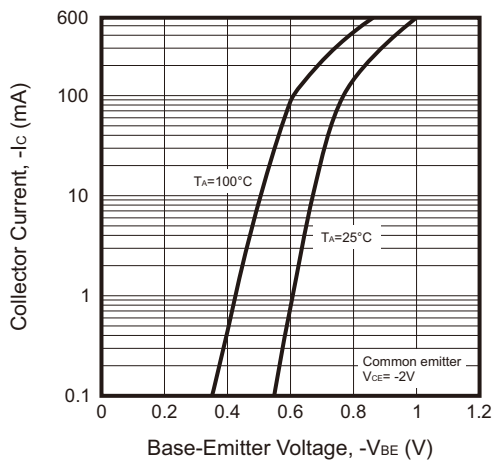
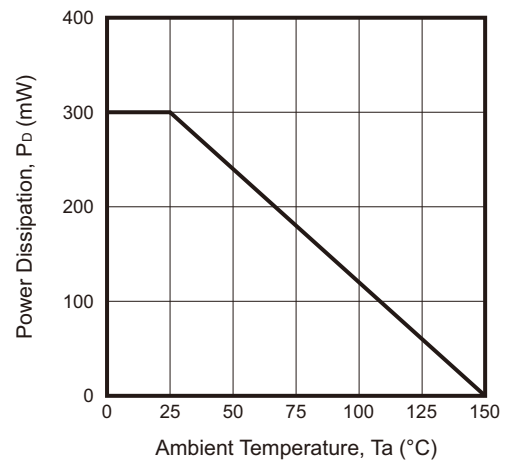
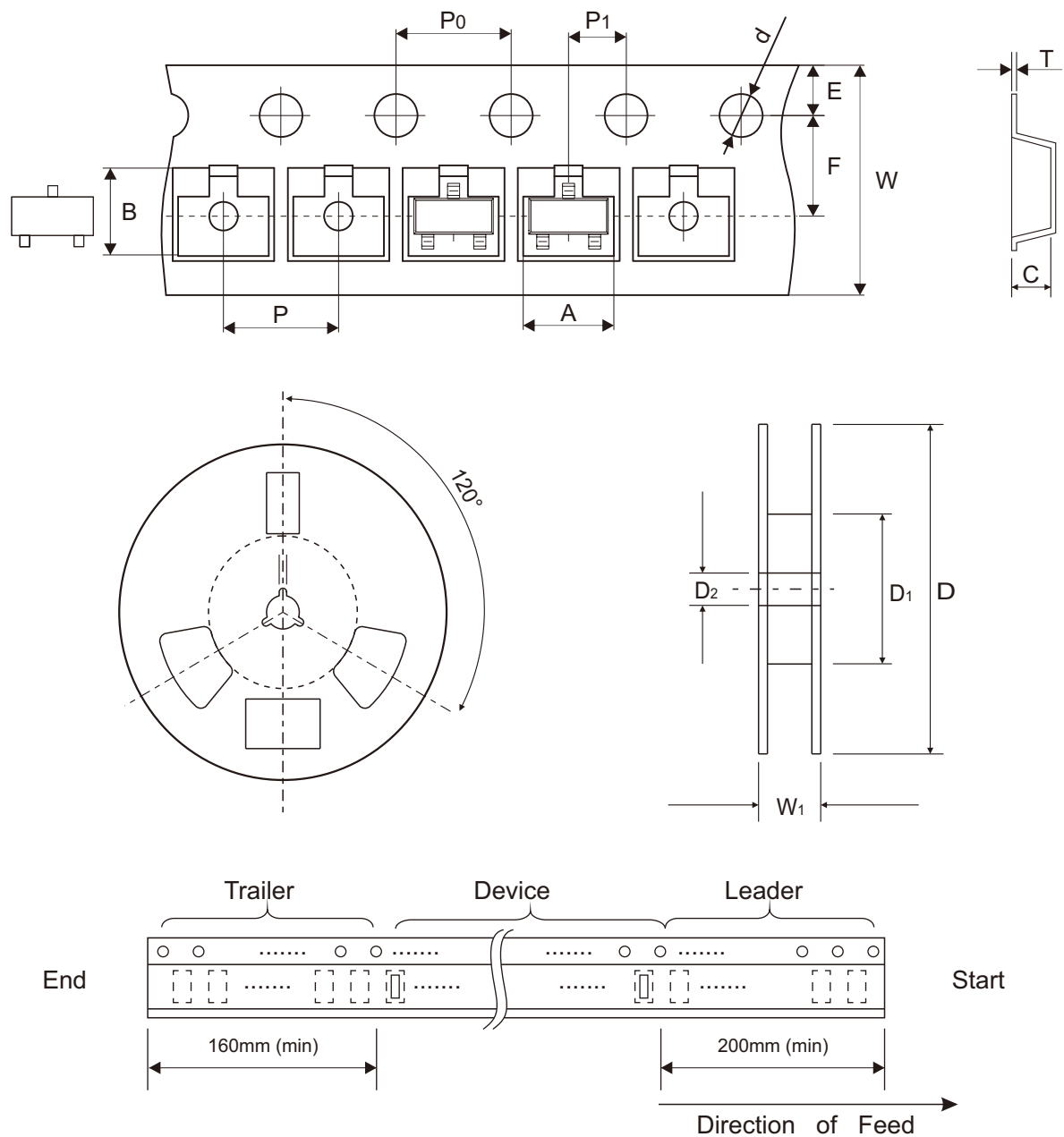


Fig.6 - Collector Power Derating Curve



Reel Taping Specification

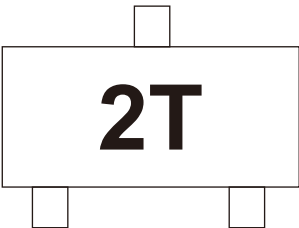


SOT-23	SYMBOL	A	B	C	d	D	D1	D2
	(mm)	3.15 ± 0.10	2.77 ± 0.10	1.22 + 0.08 - 0.10	1.50 + 0.10 - 0.00	178.00 ± 2.00	50.00 ± 0.50	13.00 ± 0.25
	(inch)	0.124 ± 0.004	0.109 ± 0.004	0.048 + 0.003 - 0.004	0.059 + 0.004 - 0.000	7.008 ± 0.079	1.969 ± 0.020	0.512 ± 0.010

SOT-23	SYMBOL	E	F	P	P0	P1	T	W	W1
	(mm)	1.75 ± 0.10	3.50 ± 0.10	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	0.20 ± 0.02	8.00 + 0.30 - 0.10	9.50 ± 0.50
	(inch)	0.069 ± 0.004	0.138 ± 0.004	0.157 ± 0.004	0.157 ± 0.004	0.079 ± 0.002	0.008 ± 0.001	0.315 + 0.012 - 0.004	0.374 ± 0.020

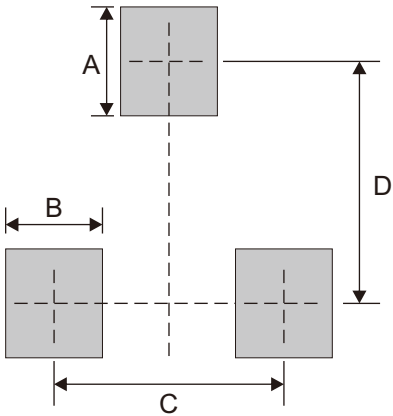
Marking Code

Part Number	Marking Code
MMBT4403-P2-HF	2T



Suggested P.C.B. PAD Layout

SIZE	SOT-23	
	(mm)	(inch)
A	0.90	0.035
B	0.80	0.031
C	1.90	0.075
D	2.00	0.079



Standard Packaging

Case Type	REEL PACK	
	REEL (pcs)	Reel Size (inch)
SOT-23	3,000	7