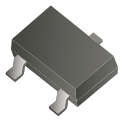
General Purpose Transistor

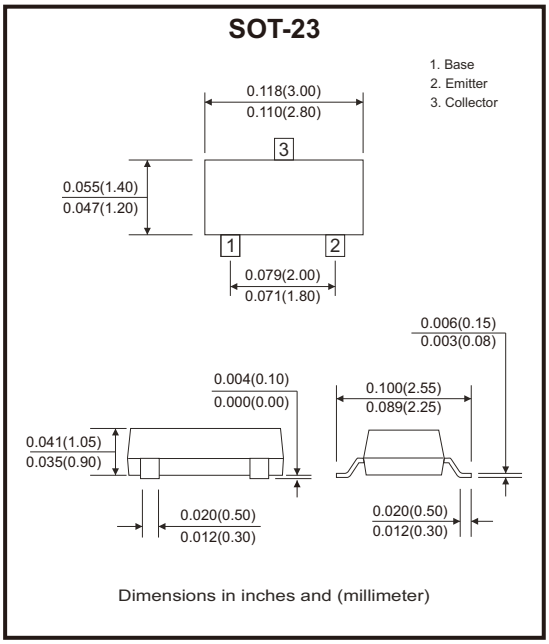
AFMMT491-HF (NPN)

RoHS Device
Halogen Free



Features

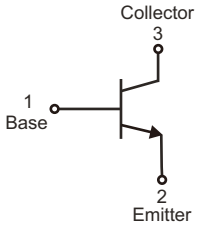
- Low equivalent on-resistance.
- Surface mount package ideally suited for automatic insertion.
- AEC-Q101 Qualified.



Mechanical data

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

Circuit Diagram



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

Parameter	Symbol	Value	Unit
Collector-base voltage	V_{CBO}	80	V
Collector-emitter voltage	V_{CEO}	60	V
Emitter-base voltage	V_{EBO}	5	V
Collector continuous current	I_C	1	A
Peak pulse current	I_{CM}	2	A
Collector power dissipation	P_C	250	mW
Thermal resistance from junction to ambient	$R_{\theta JA}$	500	°C/W
Operation junction and storage temperature range	T_J, T_{STG}	-55 to +150	°C

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

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Collector-base breakdown voltage	I_C = 100μA, I_E = 0A	$V_{(BR)CBO}$	80			V
Collector-emitter breakdown voltage (Note 1)	I_C = 10mA, I_B = 0A	$V_{(BR)CEO}$	60			V
Emitter-base breakdown voltage	I_E = 100μA, I_C = 0A	$V_{(BR)EBO}$	5			V
Collector cut-off current	V_{CB} = 60V, I_E = 0A	I_{CBO}			0.1	μA
Emitter-base cut-off current	V_{EB} = 4V, I_C = 0A	I_{EBO}			0.1	μA
DC current gain (Note 1)	V_{CE} = 5V, I_C = 1mA	$h_{FE(1)}$	100			
	V_{CE} = 5V, I_C = 500mA	$h_{FE(2)}$	100		300	
	V_{CE} = 5V, I_C = 1A	$h_{FE(3)}$	80			
	V_{CE} = 5V, I_C = 2A	$h_{FE(4)}$	30			
Collector-emitter saturation voltage (Note 1)	I_C = 500mA, I_B = 50mA	$V_{CE(sat)\,1}$			0.25	V
	I_C = 1A, I_B = 100mA	$V_{CE(sat)\,2}$			0.5	V
Base-emitter saturation voltage (Note 1)	I_C = 1A, I_B = 100mA	$V_{BE(sat)}$			1.1	V
Base-emitter voltage (Note 1)	V_{CE} = 5V, I_C = 1A	V_{BE}			1	V
Transition frequency	V_{CE} = 10V, I_C = 50mA, f = 100MHz	f_T	150			MHz
Collector output capacitance	V_{CB} = 10V, f = 1MHz	C_{ob}			10	pF

Note: 1. Measured under pulse conditions, pulse width = 300μs, duty cycle ≤ 2%.

Typical Rating and Characteristic Curves (AFMMT491-HF)

Fig.1 - Static Characteristic

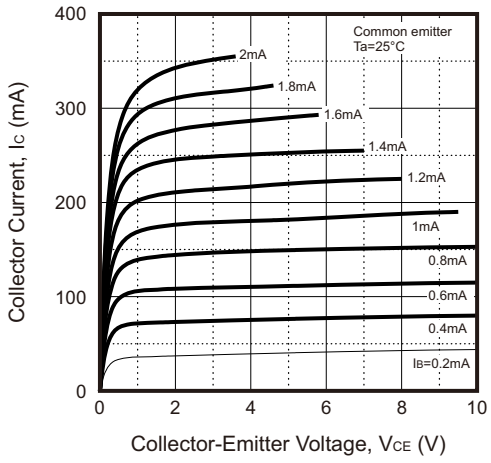
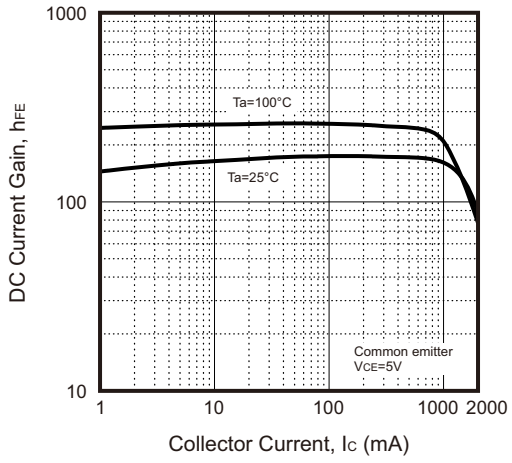


Fig.2 - h_{FE} — I_C



Typical Rating and Characteristic Curves (AFMMT491-HF)

Fig.3 - V_{CEsat} — I_C

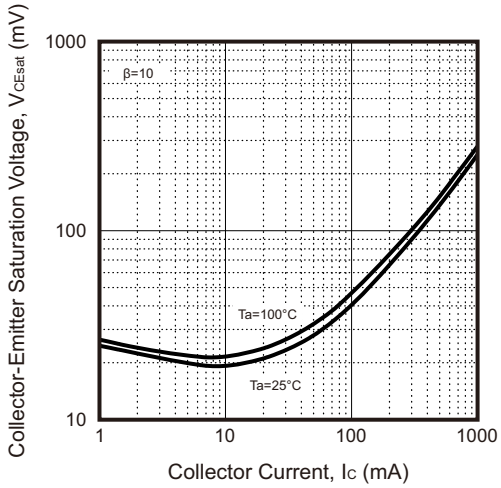


Fig.4 - V_{BEsat} — I_C

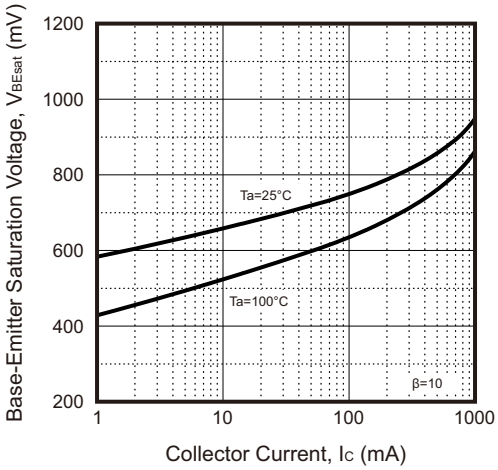


Fig.5 - I_C — V_{BE}

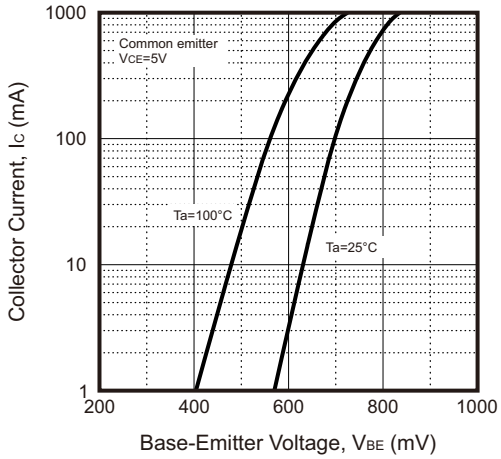


Fig.6 - C_{ob}/C_{ib} — V_{CB}/V_{EB}

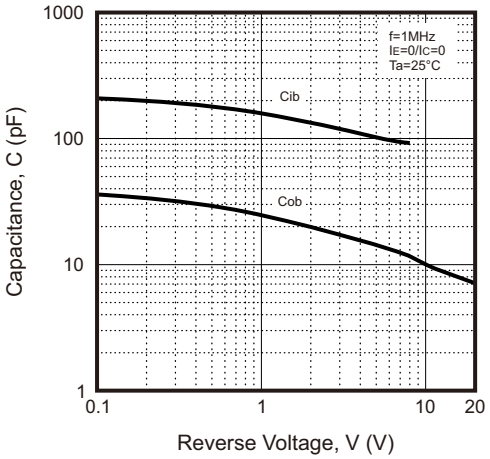


Fig.7 - f_T — I_C

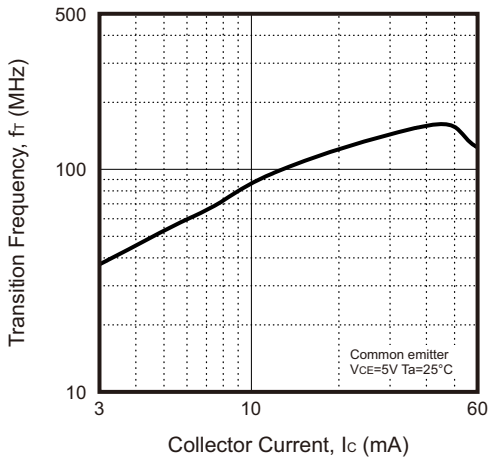
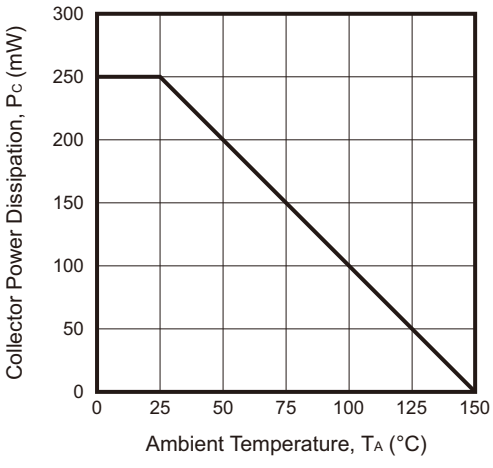
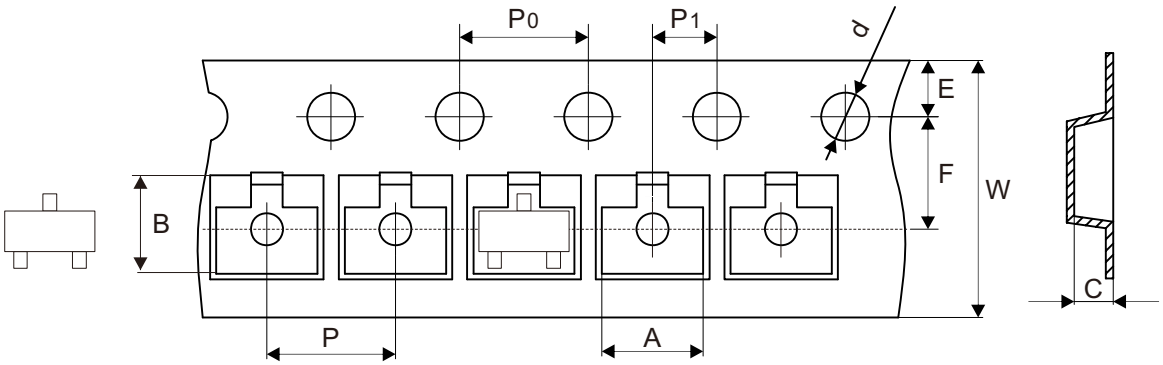
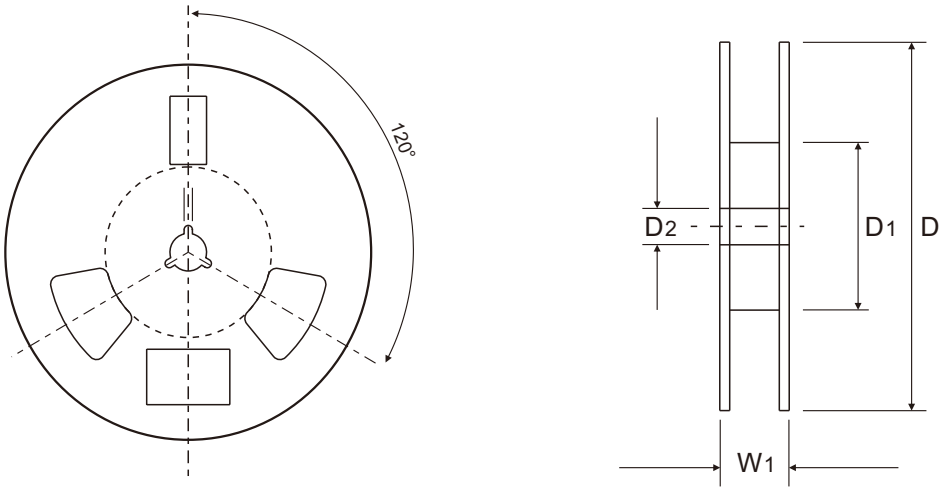


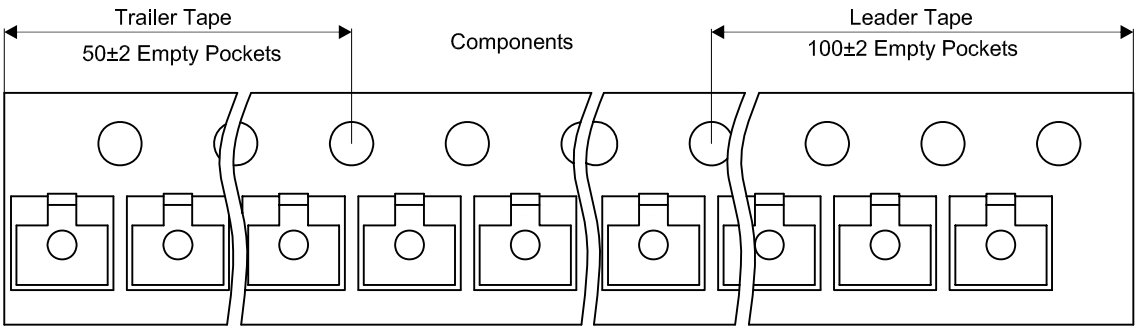
Fig.8 - P_C — T_A



Reel Taping Specification





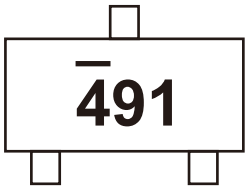


	SYMBOL	A	B	C	d	D	D1	D2
SOT-23	(mm)	3.15 ± 0.10	2.77 ± 0.10	1.22 ± 0.10	1.50 + 0.10 − 0.00	178.00 ± 1.00	54.40 ± 0.40	13.00 ± 0.20
	(inch)	0.124 ± 0.004	0.109 ± 0.004	0.048 ± 0.004	0.059 + 0.004 − 0.000	7.008 ± 0.039	2.142 ± 0.016	0.512 ± 0.008

	SYMBOL	E	F	P	P0	P1	W	W1
SOT-23	(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	12.10 ± 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	0.476 ± 0.039

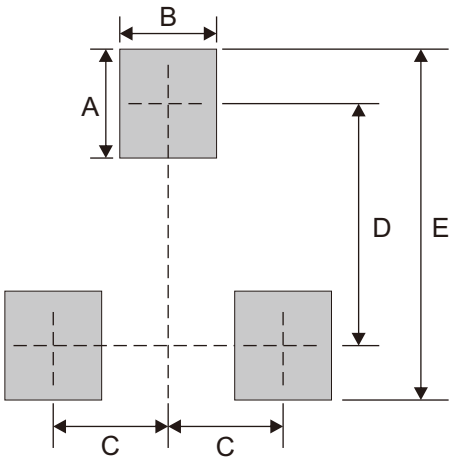
Marking Code

Part Number	Marking Code
AFMMT491-HF	491



Suggested P.C.B. PAD Layout

SIZE	SOT-23	
	(mm)	(inch)
A	0.90	0.035
B	0.80	0.031
C	0.95	0.037
D	2.00	0.079
E	2.90	0.114



Standard Packaging

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