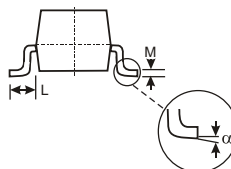
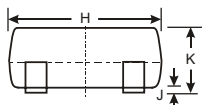
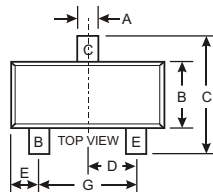
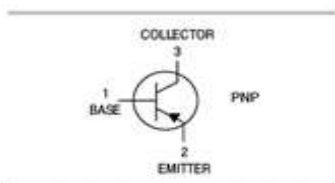
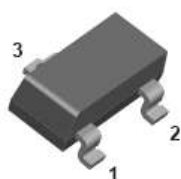


Features

- Epitaxial Planar Die Construction.
- NPN complement:MMBT2222A
- Ideal for Medium Power Amplification and Switching.
- Marking Code:2F



SOT-23		
Dim	Min	Max
A	0.37	0.51
B	1.20	1.40
C	2.30	2.50
D	0.89	1.03
E	0.45	0.60
G	1.78	2.05
H	2.80	3.00
J	0.013	0.10
K	0.903	1.10
L	0.45	0.61
M	0.085	0.180
α	0°	8°
All Dimensions in mm		

Maximum Ratings @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Rating	Symbol	Max	Unit
Collector-Emitter Voltage	V _{CEO}	-60	V
Collector-Base Voltage	V _{CBO}	-60	V
Emitter-Base Voltage	V _{EB0}	-5	V
Collector Current	I _C	-600	mA

• THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation FR-5 Board,(1) T _A =25°C Derate above 25°C	PD	225 1.8	mW mW/°C
Thermal Resistance,Junction to Ambient	R _{θJA}	556	°C/W
Total Device Dissipation Alumina Substrate,(2) T _A =25°C Derate above 25°C	PD	300 2.4	mW mW/°C
Thermal Resistance,Junction to Ambient	R _{θJA}	417	°C/W
Junction and Storage Temperature	T _j , T _{stg}	-55 to +150	°C

1. FR-5 = 1.0 x 0.75 x 0.062 in.

2. Alumina = 0.4 x 0.3 x 0.024 in. 99.5% alumina.

Electrical Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified

OFF CHARACTERISTICS

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Collector–Emitter Breakdown Voltage ($I_C = -10\text{ mA}$, $I_B = 0$)	$V_{BR}(CEO)$	-60	-	-	V
Collector–Base Breakdown Voltage ($I_C = -10\text{ }\mu\text{A}$, $I_E = 0$)	$V_{BR}(CBO)$	-60	-	-	V
Emitter–Base Breakdown Voltage ($I_E = -10\text{ }\mu\text{A}$, $I_C = 0$)	$V_{BR}(EBO)$	-5	-	-	V
Collector Cutoff Current ($V_{CE} = -30\text{ V}$, $V_{BE} = -0.5\text{ V}$)	I_{CEX}	-	-	-50	nA
Collector Cutoff Current ($V_{CB} = -50\text{ V}$, $I_E = 0$) ($V_{CB} = -50\text{ V}$, $I_E = 0$, $T_A = 125^\circ\text{C}$)	I_{CBO}	-	-	-0.01 -10	μA
Base Cutoff Current ($V_{CE} = -30\text{ V}$, $V_{BE} = -0.5\text{ V}$)	I_{BL}	-	-	-50	nA

ON CHARACTERISTICS (Note 2.)

DC Current Gain ($I_C = -0.1\text{ mA}$, $V_{CE} = -10\text{ V}$) ($I_C = -1.0\text{ mA}$, $V_{CE} = -10\text{ V}$) ($I_C = -10\text{ mA}$, $V_{CE} = -10\text{ V}$) ($I_C = -150\text{ mA}$, $V_{CE} = -10\text{ V}$) ($I_C = -500\text{ mA}$, $V_{CE} = -10\text{ V}$)	HFE	75 100 100 100 50	- - - - -	- - - 300 -	
Collector–Emitter Saturation Voltage ($I_C = -150\text{ mA}$, $I_B = -15\text{ mA}$) ($I_C = -500\text{ mA}$, $I_B = -50\text{ mA}$)	$V_{CE}(\text{sat})$	- -	- -	-0.4 -1.6	V
Base–Emitter Saturation Voltage ($I_C = -150\text{ mA}$, $I_B = -15\text{ mA}$) ($I_C = -500\text{ mA}$, $I_B = -50\text{ mA}$)	$V_{BE}(\text{sat})$	- -	- -	-1.3 -2.6	V

SMALL–SIGNAL CHARACTERISTICS

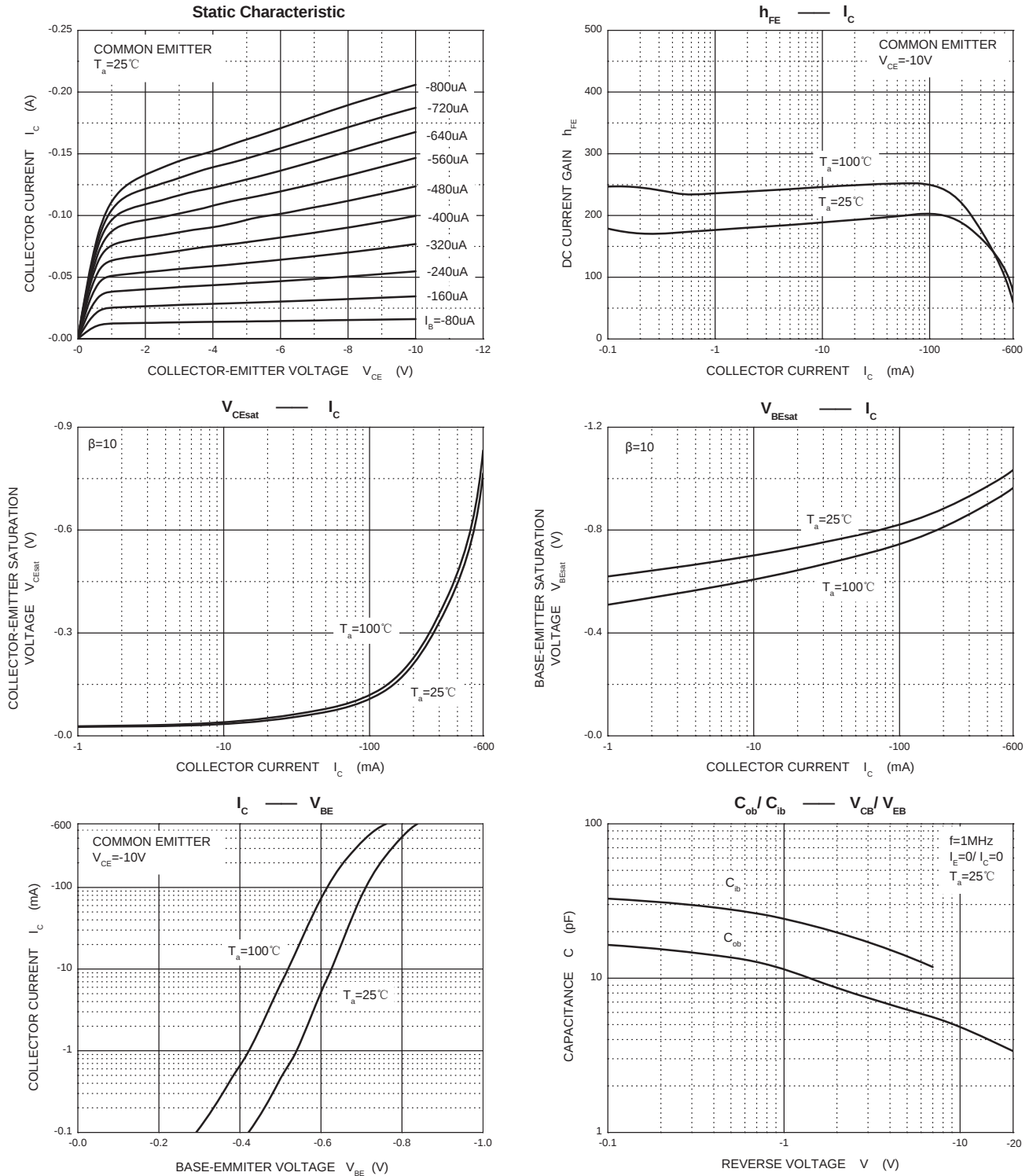
Current–Gain — Bandwidth Product ($I_C = -50\text{ mA}$, $V_{CE} = -20\text{ V}$, $f = 100\text{ MHz}$)	f_T	200	-	-	MHz
Output Capacitance ($V_{CB} = -10\text{ V}$, $I_E = 0$, $f = 1.0\text{ MHz}$)	C_{obo}	-	-	8	pF
Input Capacitance ($V_{EB} = -2\text{ V}$, $I_C = 0$, $f = 1.0\text{ MHz}$)	C_{ibo}	-	-	30	pF

SWITCHING CHARACTERISTICS

Turn–On Time	(VCC = -30 V, $I_C = -150\text{ mA}$, $I_{B1} = -15\text{ mA}$)	t_{on}	-	-	45	ns
Delay Time		t_d	-	-	10	
Rise Time		t_r	-	-	40	
Storage Time	(VCC = -6 V, $I_C = -150\text{ mA}$, $I_{B1} = I_{B2} = -15\text{ mA}$)	t_{off}	-	-	100	
Fall Time		t_s	-	-	80	
Turn–Off Time		t_f	-	-	30	

2. Pulse Test: Pulse Width $\leq 300\text{ }\mu\text{s}$, Duty Cycle $\leq 2.0\%$.

TYPICAL TRANSIENT CHARACTERISTICS



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