

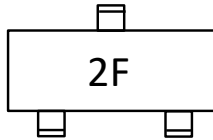
## Small Signal Transistor

## 60V PNP SOT23

### Features

- Power Dissipation of 250mW
- Epitaxial Planar Die Construction
- High Stability and High Reliability
- Complementary NPN Type Available (MMBT2222A)

### Marking Information



"2F" = Product Type Marking Code

### Package Outline





SOT23 Top View

### Mechanical Data

- Case: SOT23 Package
- Case Material: "Green" Molding Compound UL Flammability Classification Rating 94V-0

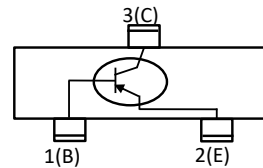
- Halogen Free

Note: Products with logo  or  are made by HY Electronic (Cayman) Limited.

### Ordering Information

- Package :SOT23
- Reel Size :7 (inches)
- Quantity Per Reel :3,000 pcs
- Quantity One Box :45,000 pcs
- Quantity One Carton :180,000 pcs

### Device Schematic & PIN Configuration



Pin Assignment	
1	Base
2	Emitter
3	Collector

### Maximum Ratings (@TA = +25°C, unless otherwise specified.)

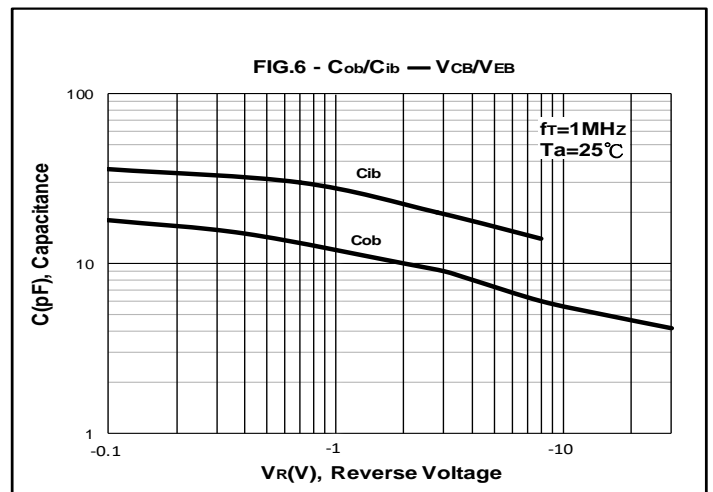
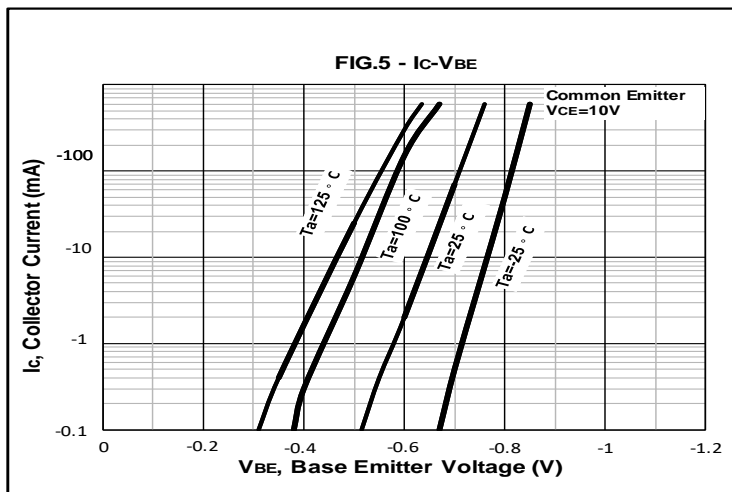
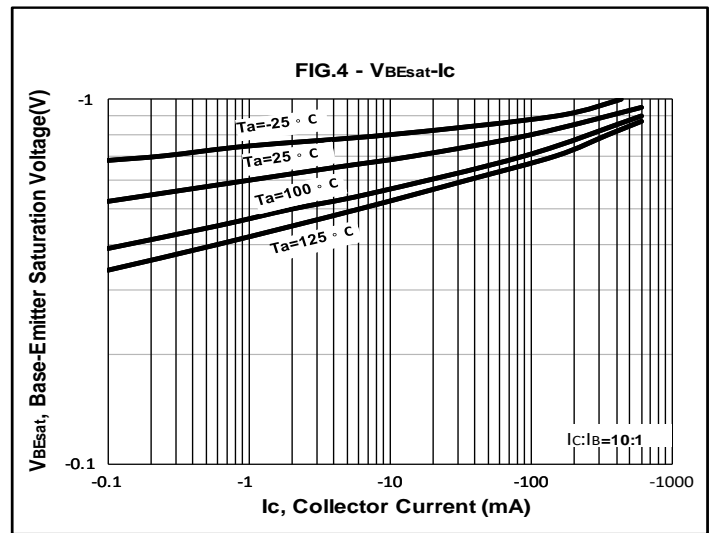
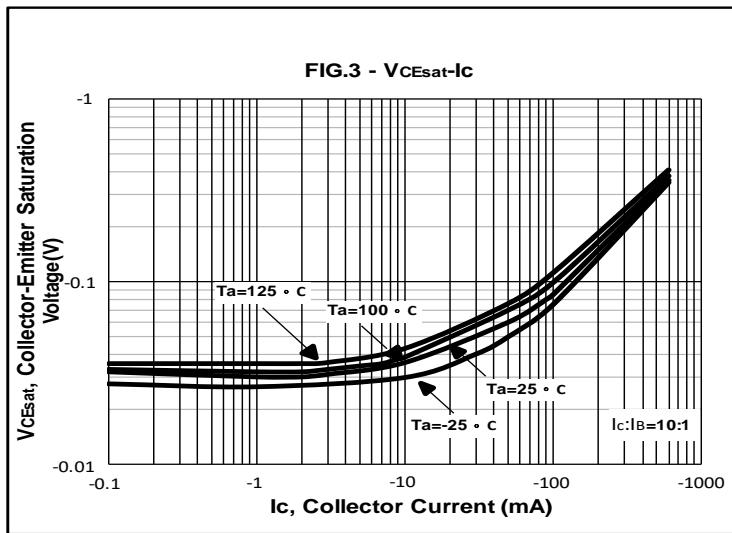
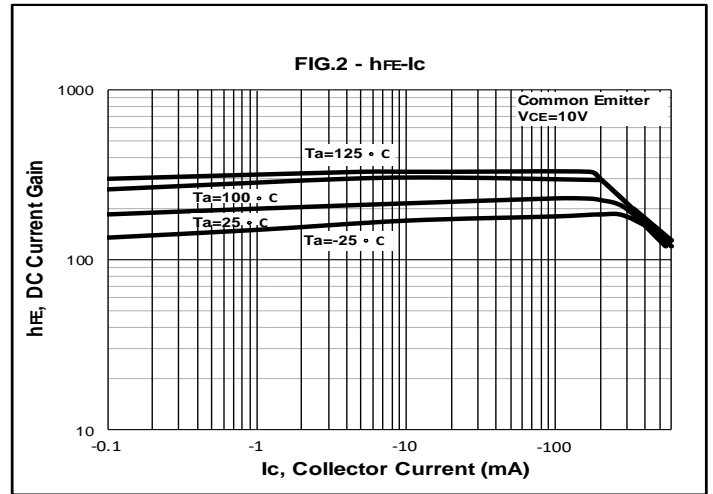
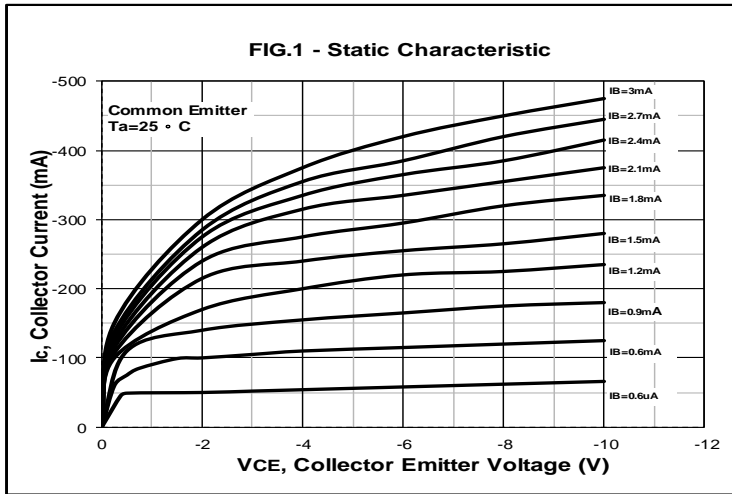
Parameter	Symbol	Value	Unit
Collector-Base Voltage	$V_{CBO}$	-60	V
Collector-Emitter Voltage	$V_{CEO}$	-60	
Emitter-Base Voltage	$V_{EBO}$	-5	
Collector Current-Continuous	$I_C$	-600	mA
Collector Power Dissipation	$P_C$	250	mW
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	417	°C/W
Junction Temperature	$T_j$	150	°C
Storage Temperature Range	$T_{STG}$	-55 to +150	°C

### Electrical Characteristics(@TA = +25°C, unless otherwise specified.)

Parameter	Test Conditions	Symbol	Min	Max	Unit
Collector-Base Breakdown Voltage	$I_C = -100\mu A, I_E = 0$	$V_{(BR)CBO}$	-60	-	V
Collector-Emitter Breakdown Voltage	$I_C = -1mA, I_B = 0$	$V_{(BR)CEO}$	-60	-	
Emitter-Base Breakdown Voltage	$I_E = -10\mu A, I_C = 0$	$V_{(BR)EBO}$	-5	-	
Collector Cut-Off Current	$V_{CB} = -50V, I_E = 0$	$I_{CBO}$	-	-20	nA
Collector Cut-Off Current	$V_{CE} = -30V, V_{BE(Off)} = -0.5V$	$I_{CEX}$	-	-50	
DC Current Gain	$V_{CE} = -10V, I_C = -150mA$	$h_{FE(1)}$	100	300	-
	$V_{CE} = -10V, I_C = -0.1mA$	$h_{FE(2)}$	75	-	
	$V_{CE} = -10V, I_C = -1mA$	$h_{FE(3)}$	100	-	
	$V_{CE} = -10V, I_C = -10mA$	$h_{FE(4)}$	100	-	
	$V_{CE} = -10V, I_C = -500mA$	$h_{FE(5)}$	50	-	
Collector-Emitter Saturation Voltage	$I_C = -150mA, I_B = -15mA$	$V_{CE(sat)1}$	-	-0.4	V
	$I_C = -500mA, I_B = -50mA$	$V_{CE(sat)2}$	-	-1.6	
Base-Emitter Saturation Voltage	$I_C = -150mA, I_B = -15mA$	$V_{BE(sat)1}$	-	-1.3	V
	$I_C = -500mA, I_B = -50mA$	$V_{BE(sat)2}$	-	-2.6	
Transition Frequency	$V_{CE} = -20V, I_C = -50mA, F = 100MHz$	$f_T$	200	-	MHz
Delay Time	$V_{CC} = -30V$	$t_d$	-	10	ns
Rise Time	$I_C = -150mA, I_{B1} = -15mA$	$t_r$	-	25	
Storage Time	$V_{CC} = -6V$	$t_s$	-	225	
Fall Time	$I_C = -150mA, I_{B1} = I_{B2} = -15mA$	$t_f$	-	60	

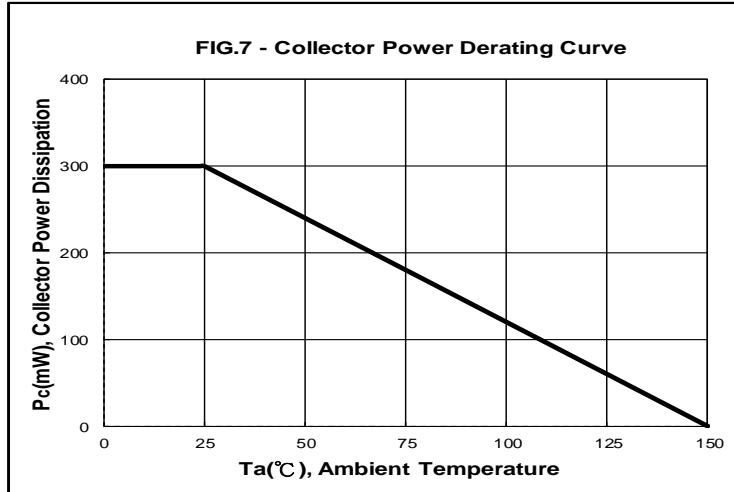


## Rating and Characteristic Curves



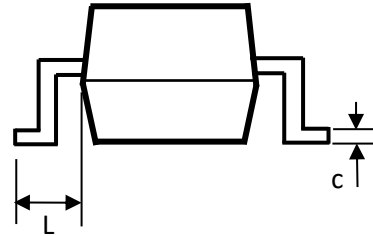
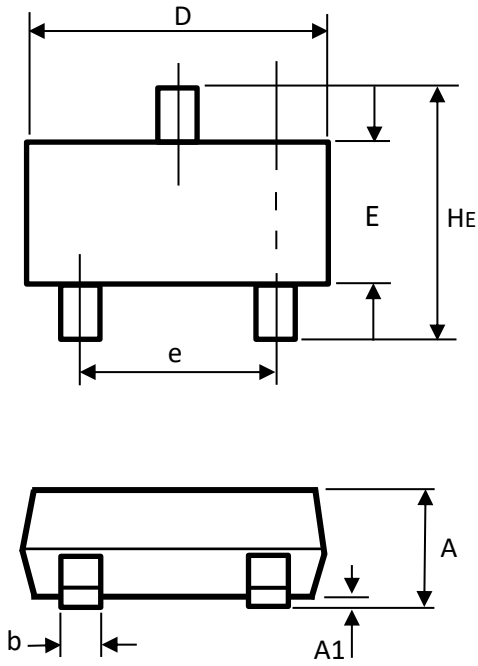


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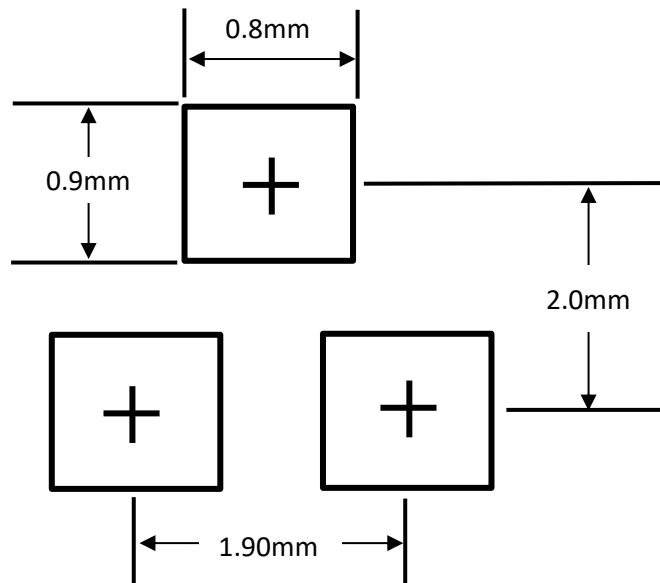


## Package Outline Dimensions



SOT23 Package		
Dim	Min	Max
A	0.90	1.15
A1	0.00	0.10
b	0.30	0.50
c	0.08	0.15
D	2.80	3.00
E	1.20	1.40
e	1.80	2.00
L	0.55 REF	
HE	2.25	2.55
All Dimensions in mm		

## Suggested Soldering Pad Layout



Note:

- 1. The pad layout is for reference purposes only.
- 2. General tolerance  $\pm 0.05\text{mm}$



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