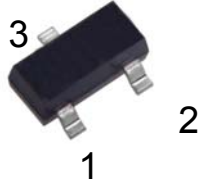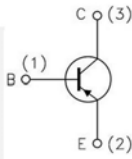# SOT-23 Plastic-Encapsulate Transistors

MMBT5401

Features:

☐ PNP Transistor

☐ Complementary to MMBT5551

☐ Ideal for Medium Power Amplification and Switching

Marking:2L

SOT-23

RoHS COMPLIANT

1.Base   (B)

2. Emitter   (E)

3.Collector (C)

Absolute Maximum Ratings (Ta=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	-160	V
Collector-Emitter Voltage	V_{CEO}	-150	V
Emitter-Base Voltage	V_{EBO}	-5	V
Collector Current	Ic	0.6	A
Collector Power Dissipation	PD	0.3	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	416	℃/W
Junction Temperature(MAX.)	Tj	150	℃
Storage Temperature	Tstg	-55 to +150	℃

Electrical Characteristics   (Ta=25℃ unless otherwise noted)

Parameter	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Collector-base breakdown voltage	$V_{(BR)CBO}$	I_C=-100µA, IE=0	-160	-	-	V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	I_C=-1mA, IB=0	-150	-	-	V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	I_E=-10µA, IC=0	-5	-	-	V
Collector cut-off current	I_{CBO}	V_{CB}=-120V, IE=0	-	-	-0.1	µA
Emitter cut-off current	I_{EBO}	V_{EB}=-4V, IC=0	-	-	-0.1	µA
DC current gain	hFE(1) *	V_{CE}=-5V, IC=-1mA	80	-	-	-
	hFE(2) *	V_{CE}=-5V, IC=-10mA	100	-	300	-
	hFE(3) *	V_{CE}=-5V, IC=-50mA	50	-	-	-
Collector-emitter saturation voltage	$V_{CE(sat)}$1*	I_C=-10mA, IB=-1mA	-	-	-0.2	V
	$V_{CE(sat)}$2*	I_C=-50mA, IB=-5mA	-	-	-0.5	V
Base-emitter saturation voltage	$V_{BE(sat)}$1*	I_C=-10mA, IB=-1mA	-	-	-1	V
	$V_{BE(sat)}$2*	I_C=-50mA, IB=-5mA	-	-	-1	V
Transition frequency	FT	V_{CE}=-5V,IC=-10mA, f=30MHz	100	-	-	MHz

CLASSIFICATION OF hFE (2)

RANK	L	H
RANGE	100-200	200-300

*Pulse test: pulse width ≤300µs, duty cycle≤ 2.0%.

Typical Characteristics

Static Characteristic

COMMON EMITTER $T_a = 25°C$

Curves labeled: -100uA, -90uA, -80uA, -70uA, -60uA, -50uA, -40uA, -30uA, -20uA, $I_B = -10uA$

COLLECTOR CURRENT I_C (mA)

COLLECTOR-EMITTER VOLTAGE V_{CE} (V)

h_{FE} —— I_C

$V_{CE} = -5V$

$T_a = 100°C$

$T_a = 25°C$

DC CURRENT GAIN h_{FE}

COLLECTOR CURRENT I_C (mA)

V_{BEsat} —— I_C

$\beta = 10$

$T_a = 25°C$

$T_a = 100°C$

BASE-EMITTER SATURATION VOLTAGE V_{BEsat} (V)

COLLECTOR CURRENT I_C (mA)

V_{CEsat} —— I_C

$\beta = 10$
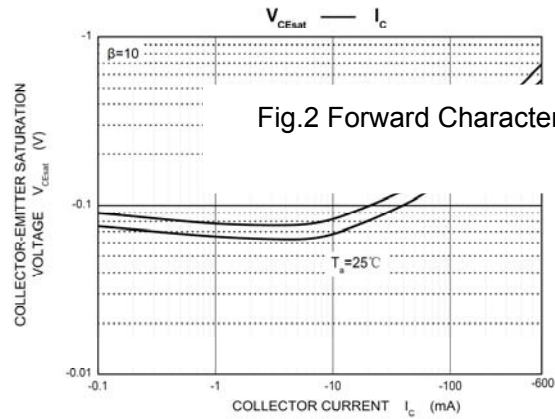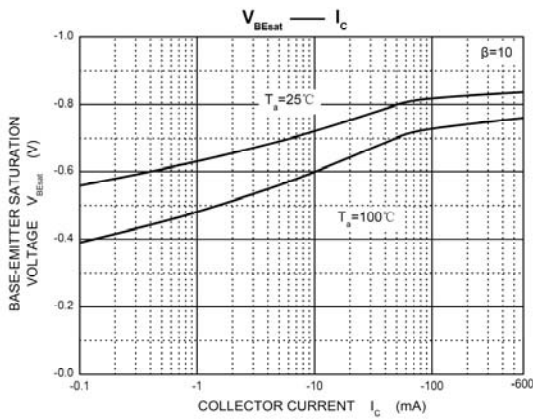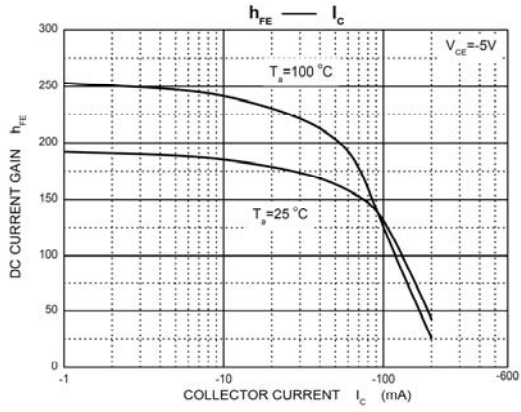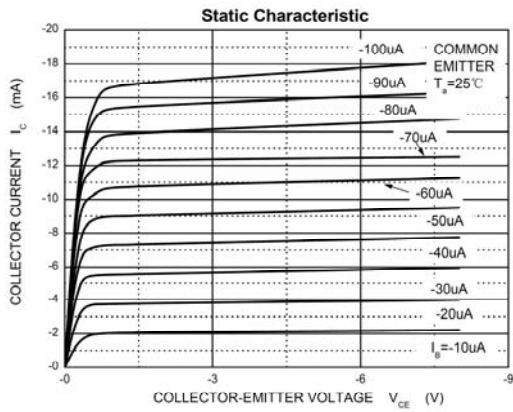
Fig.2 Forward Characteristics

$T_a = 25°C$

COLLECTOR-EMITTER SATURATION VOLTAGE V_{CEsat} (V)

COLLECTOR CURRENT I_C (mA)

I_C —— V_{BE}

$V_{CE} = -5V$

$T_a = 100°C$

$T_a = 25°C$

COLLECTOR CURRENT I_C (mA)

BASE-EMITTER VOLTAGE V_{BE} (V)

C_{ob} / C_{ib} —— V_{CB} / V_{EB}

$f = 1MHz$
$I_E = 0 / I_C = 0$
$T_a = 25°C$

Cib

Cob

CAPACITANCE C (pF)

REVERSE VOLTAGE V (V)

f_T —— I_C

$VCE = -5V$
$T_a = 25°C$

TRANSITION FREQUENCY f_T (MHz)

COLLECTOR CURRENT I_C (mA)

P_C —— T_a

COLLECTOR POWER DISSIPATION P_C (W)

AMBIENT TEMPERATURE Ta (°C)
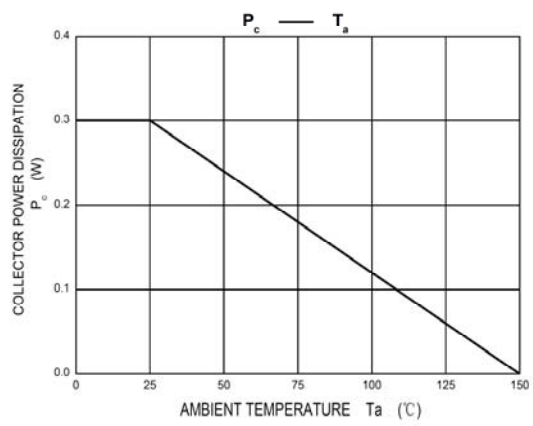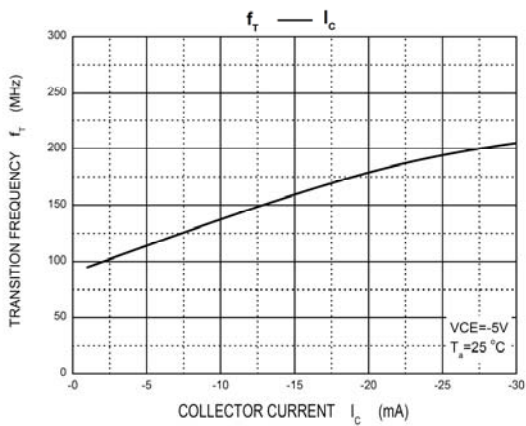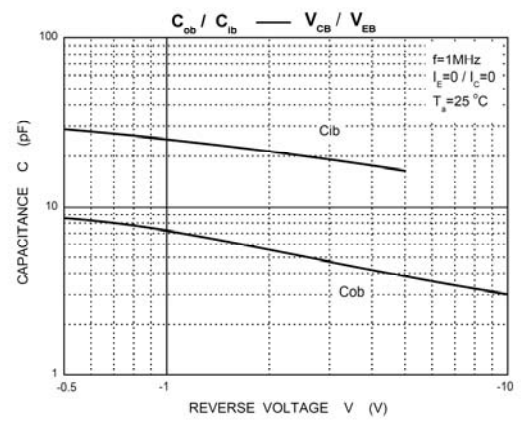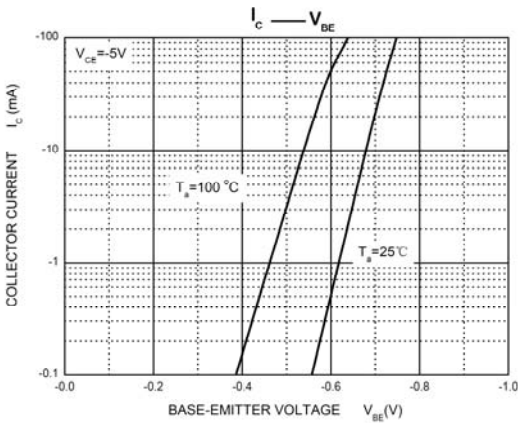
SOT-23 Plastic-Encapsulate Transistors

Package Dimension

SOT-23

Unit: mm