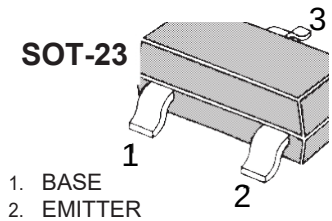
SOT-23 Plastic-Encapsulate Transistors

PBSS4140T 40 V Low $V_{CE(sat)}$ NPN Transistor



FEATURES

- Low collector-emitter saturation voltage
- High current capabilities
- Improved device reliability due to reduced heat generation.

APPLICATIONS

- General purpose switching and muting
- LCD backlighting
- Supply line switching circuits
- Battery driven equipment (mobile phones, video cameras and hand-held devices).

MARKING CODE: ZT

Absolute Maximum Ratings (T_a = 25 °C)

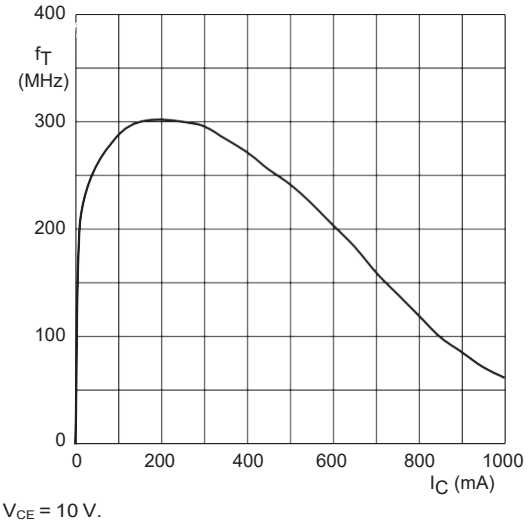
Parameter		Symbol	Value	Unit
Collector Base Voltage		V_{CBO}	40	V
Collector Emitter Voltage		V_{CEO}	40	V
Emitter Base Voltage		V_{EBO}	5	V
Collector Current (DC)		I_C	1	A
Peak Collector Current		I_{CM}	2	A
Peak Base Current		I_{BM}	1	A
Total Power Dissipation	$T_{amb} \leq 25°C$ [1]	P_{tot}	300	mW
	$T_{amb} \leq 25$ °C [2]		450	
Junction Temperature		T_j	150	°C
Storage Temperature Range		T_S	-65 to +150	°C
Thermal Resistance From Junction to Ambient	In free air [1]	$R_{th\ j\text{-}a}$	417	K/W
	In free air [2]		278	
Operating Ambient Temperature		T_{amb}	-65 to +150	°C

[1] Device mounted on a printed-circuit board; single sided copper; tinplated; standard footprint.
[2] Device mounted on a printed-circuit board; single sided copper; tinplated; mounting pad for collector 1cm^2.

Characteristics at T_{amb}=25 °C

Parameter	Symbol	Min.	Typ.	Max.	Unit
DC Current Gain					
at V_{CE}=5V, I_C=1mA	h_{FE}	300	-	-	
at V_{CE}=5V, I_C=500mA	h_{FE}	300	-	900	
at V_{CE}=5V, I_C=1A	h_{FE}	200	-	-	
Collector-Base Cutoff Current					
at V_{CB}=40V	I_{CBO}	-	-	100	nA
at V_{CB}=40V,T_{amb}=150 °C		-	-	50	μA
Collector-Emitter Cutoff Current					
at V_{CE}=30V	I_{CEO}	-	-	100	nA
Emitter-Base Cutoff Current					
at V_{EB}=5V	I_{EBO}	-	-	100	nA
Collector-Emitter Saturation Voltage					
at I_C=100mA, I_B=1mA	$V_{CE(sat)}$	-	-	200	mV
at I_C=500mA, I_B=50mA		-	-	250	
at I_C=1A, I_B=100mA		-	-	500	
Equivalent on-Resistance					
at I_C=500mA, I_B=50mA;	$R_{CE(sat)}$	-	260	<500	mΩ
Base-Emitter Saturation Voltage					
at I_C=1A, I_B=100mA	$V_{BE(sat)}$	-	-	1.2	V
Base-Emitter Turn-on Voltage					
at V_{CE}=5V, I_C=1A	$V_{BE(on)}$	-	-	1.1	V
Transition Frequency					
at V_{CE}=10V, I_C=50mA,f=100MHz	f_T	150	-	-	HMz
Collector Capacitance					
at V_{CB}=10V, f=1MHz	C_C	-	-	10	pF

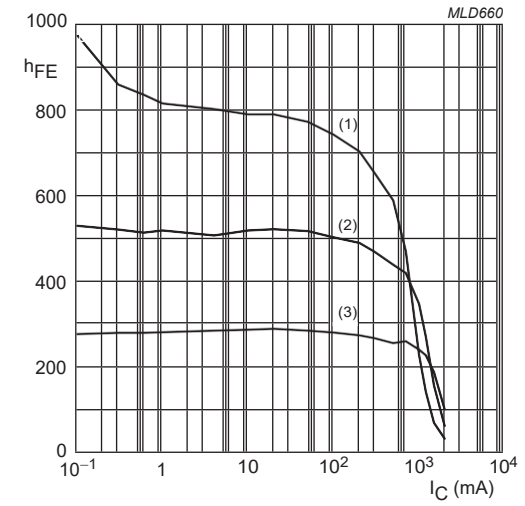
Typical Characteristics



V_{CE} = 10 V.

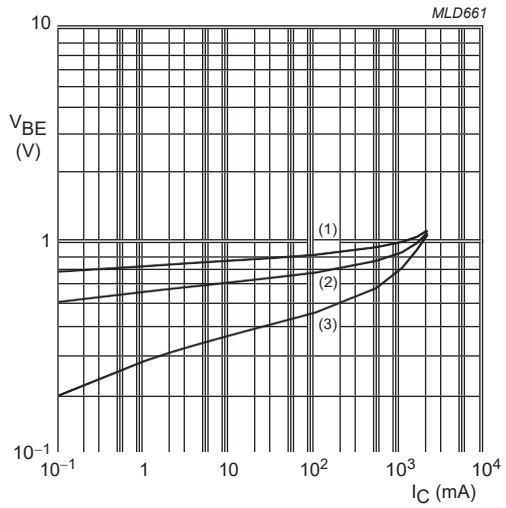
Fig.1 Transition frequency as a function of collector current.

Typical Characteristics



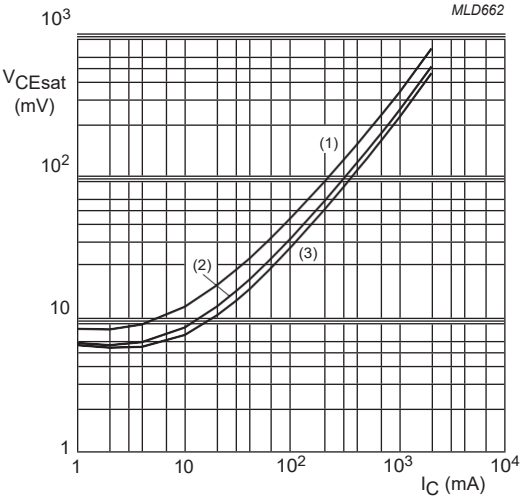
V_{CE} = 5 V.
(1) T_{amb} = 150 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = –55 °C.

Fig.2 DC current gain as a function of collector current; typical values.



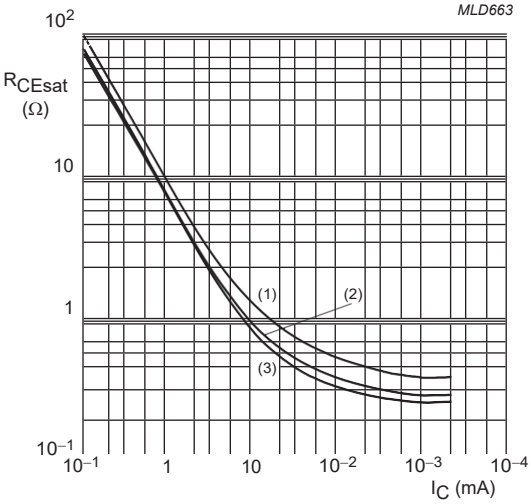
V_{CE} = 5 V.
(1) T_{amb} = –55 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = 150 °C.

Fig.3 Base-emitter voltage as a function of collector current; typical values.



I_C/I_B = 10.
(1) T_{amb} = 150 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = –55 °C.

Fig.4 Collector-emitter saturation voltage as a function of collector current; typical values.

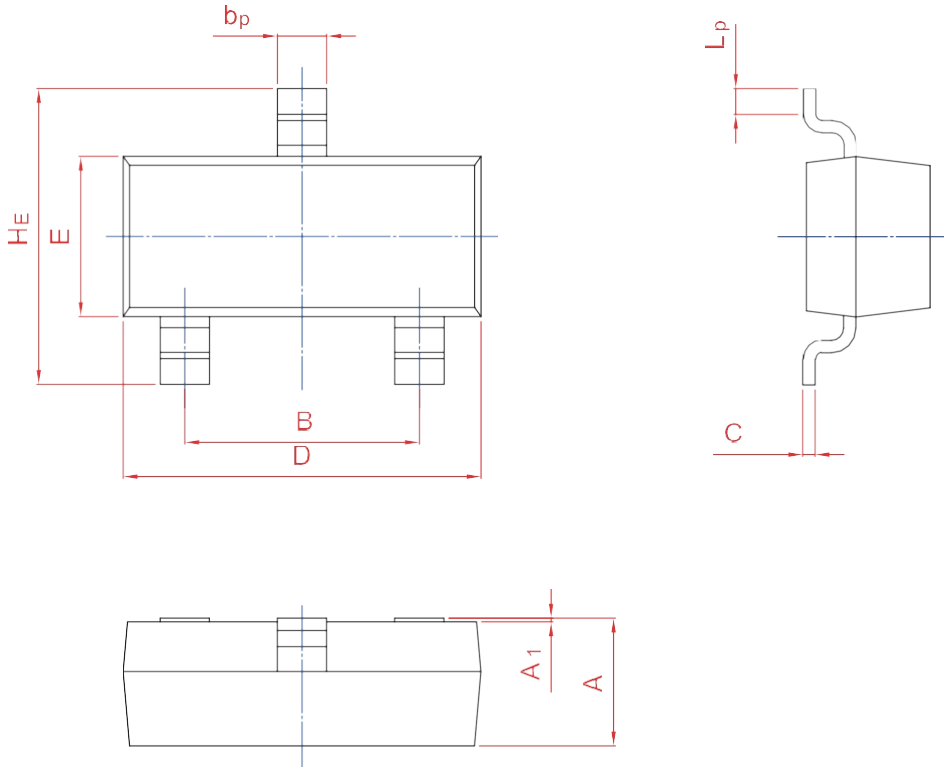


I_C/I_B = 10.
(1) T_{amb} = 150 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = –55 °C.

Fig.5 Equivalent on-resistance as a function of collector current; typical values.

PACKAGE OUTLINE

Plastic surface mounted package; 3 leads **SOT-23**



UNIT	A	B	bp	C	D	E	HE	A1	Lp
mm	1.40 0.95	2.04 1.78	0.50 0.35	0.19 0.08	3.10 2.70	1.65 1.20	3.00 2.20	0.100 0.013	0.50 0.20