

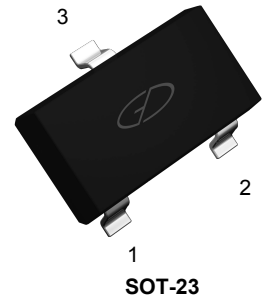
## Features

- Extremely Low Saturation Voltage
- Complementary NPN Type: MMBT618

## Application

- Gate Driving MOSFETs and IGBTs
- DC-DC Converters
- Charging Circuit
- Power Switches

1. BASE
2. EMITTER
3. COLLECTOR



## Absolute Maximum Ratings (T<sub>A</sub>=25°C unless otherwise specified)

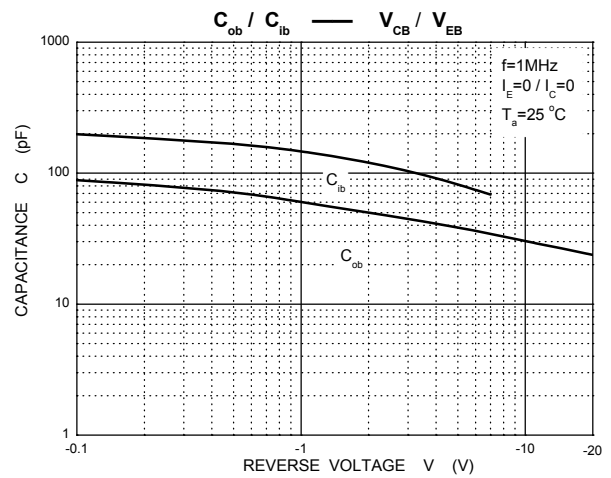
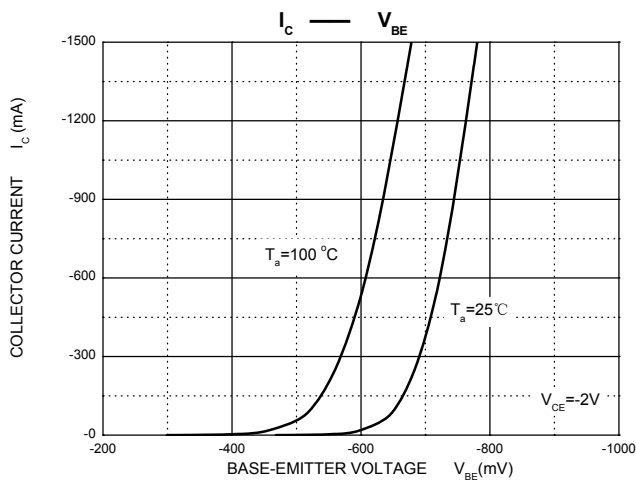
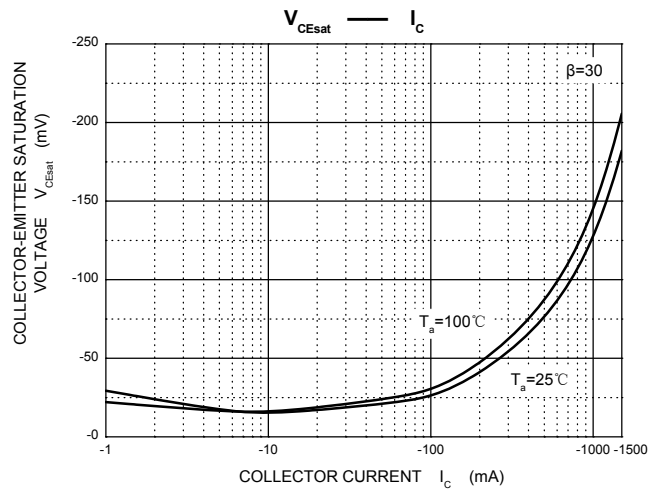
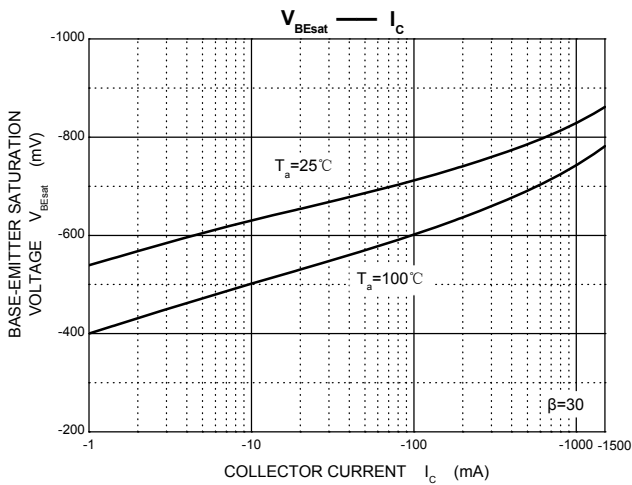
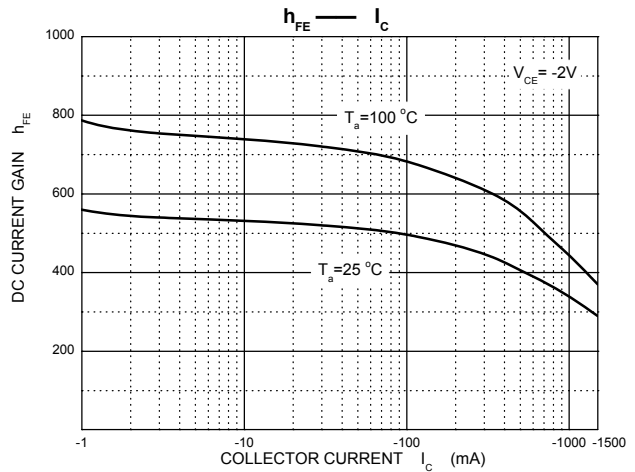
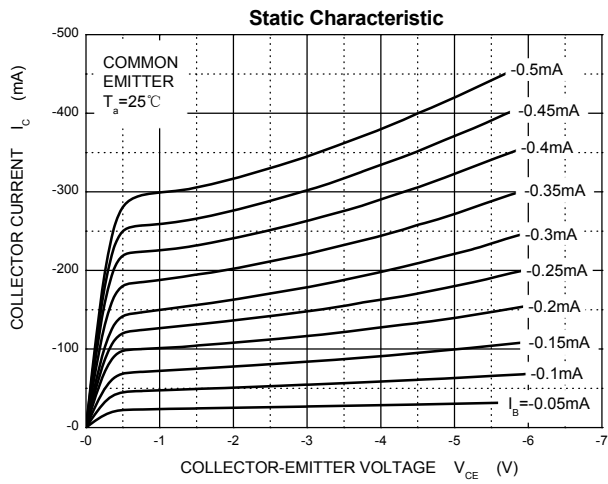
Parameter	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CBO</sub>	-20	V
Collector-Emitter Voltage	V <sub>CEO</sub>	-20	V
Emitter-Base Voltage	V <sub>EBO</sub>	-7	V
Base Current	I <sub>B</sub>	-0.5	A
Collector Current -Continuous	I <sub>C</sub>	-1.5	A
Total Collector Dissipation	P <sub>C</sub>	350	mW
Thermal Resistance from Junction to Ambient	R <sub>θJA</sub>	357	°C/W
Junction Temperature	T <sub>J</sub>	-55 to +150	°C
Storage Temperature	T <sub>STG</sub>	-55 to +150	°C

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

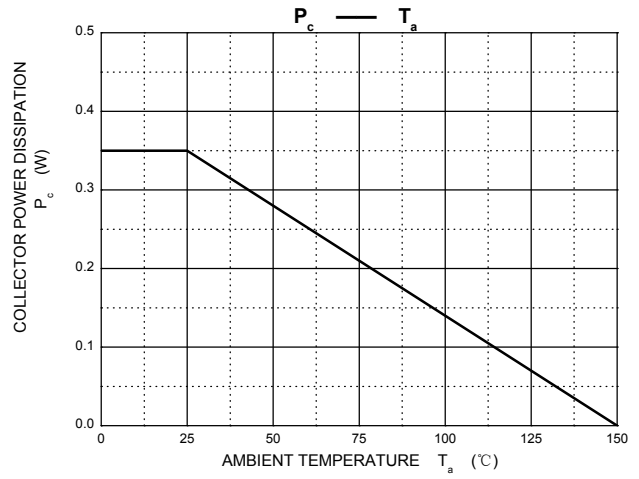
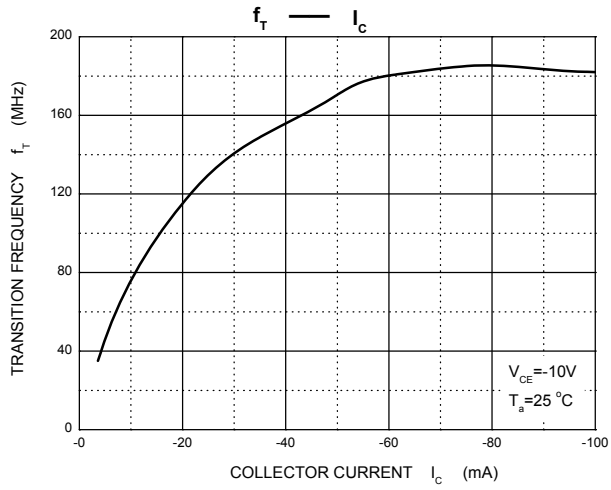
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector-base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=-100\mu\text{A}, I_E=0$	-20	--	--	V
Collector-emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=-10\text{mA}, I_B=0$	-20	--	--	V
Emitter-base Breakdown Voltage	$V_{(BR)EBO}$	$I_E=-100\mu\text{A}, I_C=0$	-7	--	--	V
Collector Cut-off Current	$I_{CBO}$	$V_{CB}=-15\text{V}, I_E=0$	--	--	-0.1	$\mu\text{A}$
Collector Cut-off Current	$I_{CES}$	$V_{CE}=-15\text{V}, V_{BE}=0$	--	--	-0.1	$\mu\text{A}$
Emitter Cut-off Current	$I_{EBO}$	$V_{EB}=-4\text{V}, I_C=0$	--	--	-0.1	$\mu\text{A}$
DC Current Gain	$h_{FE(1)}$ *	$V_{CE}=-2\text{V}, I_C=-10\text{mA}$	300	--	--	--
	$h_{FE(2)}$ *	$V_{CE}=-2\text{V}, I_C=-100\text{mA}$	300	--	--	--
	$h_{FE(3)}$ *	$V_{CE}=-2\text{V}, I_C=-2\text{A}$	150	--	--	--
	$h_{FE(4)}$ *	$V_{CE}=-2\text{V}, I_C=-4\text{A}$	35	--	--	--
Collector-Emitter Saturation Voltage	$V_{CE(sat)(1)}$ *	$I_C=-0.1\text{A}, I_B=-10\text{mA}$	--	--	-40	mV
	$V_{CE(sat)(2)}$ *	$I_C=-1\text{A}, I_B=-20\text{mA}$	--	--	-200	mV
	$V_{CE(sat)(3)}$ *	$I_C=-1.5\text{A}, I_B=-50\text{mA}$	--	--	-220	mV
Base-Emitter Saturation Voltage	$V_{BE(sat)}$ *	$I_C=-1.5\text{A}, I_B=-50\text{mA}$	--	--	-1	V
Base-Emitter Voltage	$V_{BE(on)}$ *	$V_{CE}=-2\text{V}, I_C=-2\text{A}$	--	--	-1	V
Transition Frequency	$f_T$	$V_{CE}=-10\text{V}, I_C=-50\text{mA}, f=100\text{MHz}$	150	--	--	MHz
Collector Output Capacitance	$C_{ob}$	$V_{CB}=-10\text{V}, f=1\text{MHz}$	--	--	30	pF
Turn-On Time	$t_{(on)}$	$V_{CC}=-10\text{V}, I_C=-1\text{A}, I_{B1}=I_{B2}=-20\text{mA}$	--	40	--	ns
Turn-Off Time	$t_{(off)}$		--	670	--	ns

\*Measured under pulse conditions . Pulse width =300 $\mu\text{s}$ . Duty cycle $\leq$ 2%.

**Typical Characteristic Curves**

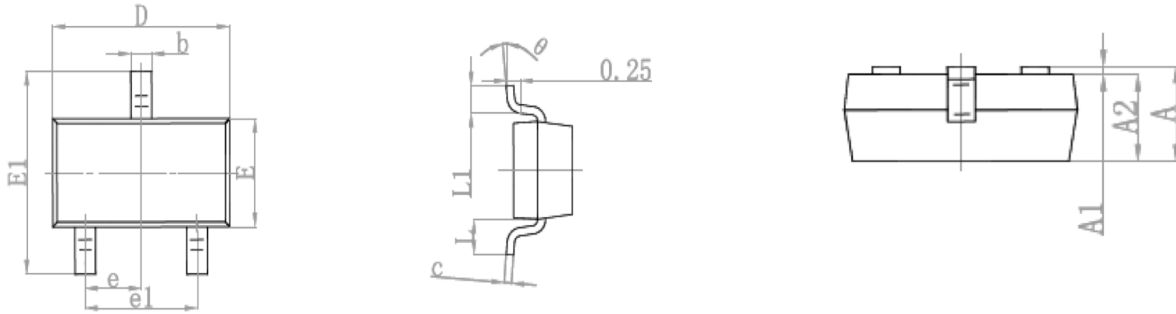


**Typical Characteristic Curves**



**Package Outline Dimensions**

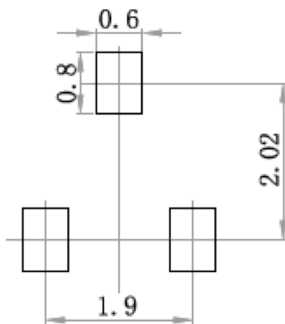
SOT-23



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

**Suggested Pad Layout**

SOT-23



- Note:
1. Controlling dimension: in millimeters.
  2. General tolerance:  $\pm 0.05\text{mm}$ .
  3. The pad layout is for reference purposes only.