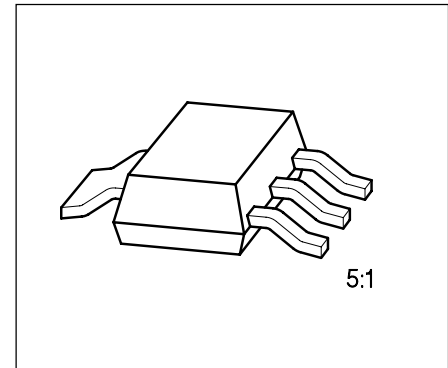


## IGBT Transistor

**BSP 280**

### Preliminary Data

- $V_{CE}$  1000 V
- $I_C$  2.5 A
- N channel
- MOS input (voltage-controlled)
- High switch speed
- Very low tail current
- Latch-up free
- Suitable freewheeling diode BAX 280



Type	Ordering Code	Tape and Reel Information	Pin Configuration				Marking	Package
			1	2	3	4		
BSP 280	Q67000-S279	E6327: 1000 pcs/reel	G	C	E	C	BSP 280	SOT-223

### Maximum Ratings

Parameter	Symbol	Values	Unit
Continuous collector current	$I_C$	2.5 1.5	A
Soldering point, $T_S = 25\text{ °C}$			
$T_S = 80\text{ °C}$			
Continuous collector current ambient, $T_A = 80\text{ °C}$	$I_C$	0.5	
Pulsed collector current	$I_{C\text{ puls}}$	3.0	
Soldering point, $T_S = 80\text{ °C}$			
Collector-emitter voltage	$V_{CE}$	1000	V
Gate-emitter voltage	$V_{GE}$	$\pm 20$	
Power dissipation	$P_{tot}$	10 1.8	W
Soldering point, $T_S = 80\text{ °C}$			
Ambient $T_A = 25\text{ °C}$			
Operating and storage temperature range	$T_j, T_{stg}$	- 40 ... + 150	°C
Thermal resistance <sup>1)</sup>	chip-ambient $R_{thJA}$ chip-soldering point $R_{thJS}$	70 6	K/W
DIN humidity category, DIN 40 040	–	E	–
IEC climatic category, DIN IEC 68-1	–	40/150/56	

**IGBT** = Insulated Gate Bipolar Transistor

<sup>1)</sup> Transistor on epoxy pcb 40 mm × 40 mm × 1.5 mm with 6 cm<sup>2</sup> copper area for drain connection.

## Electrical Characteristics

at  $T_j = 25\text{ °C}$ , unless otherwise specified.

Parameter	Symbol	Values			Unit
		min.	typ.	max.	

## Static Characteristics

Collector-emitter breakdown voltage $V_{GE} = 0, I_C = 0.1\text{ mA}$	$V_{(BR)CES}$	1000	–	–	V
Gate threshold voltage $V_{GE} = V_{CE}, I_C = 0.1\text{ mA}$	$V_{GE(th)}$	4.5	5.5	6.5	
Collector-emitter saturation voltage $V_{GE} = 15\text{ V}, I_C = 0.5\text{ A}$ $T_j = 25\text{ °C}$ $T_j = 125\text{ °C}$ $T_j = 150\text{ °C}$	$V_{CE(sat)}$	–	1.8	–	
$V_{GE} = 15\text{ V}, I_C = 1.5\text{ A}$ $T_j = 25\text{ °C}$ $T_j = 125\text{ °C}$ $T_j = 150\text{ °C}$		–	2.1	–	
		–	2.2	3.0	
		–	2.8	3.3	
		–	3.8	4.3	
		–	4.0	4.5	
Zero gate voltage collector current $V_{CE} = 1000\text{ V}, V_{GE} = 0$ $T_j = 25\text{ °C}$ $T_j = 125\text{ °C}$	$I_{CES}$	–	1	25	$\mu\text{A}$
		–	–	100	
Gate-emitter leakage current $V_{GE} = 20\text{ V}, V_{CE} = 0$	$I_{GES}$	–	0.1	100	nA

## Dynamic Characteristics

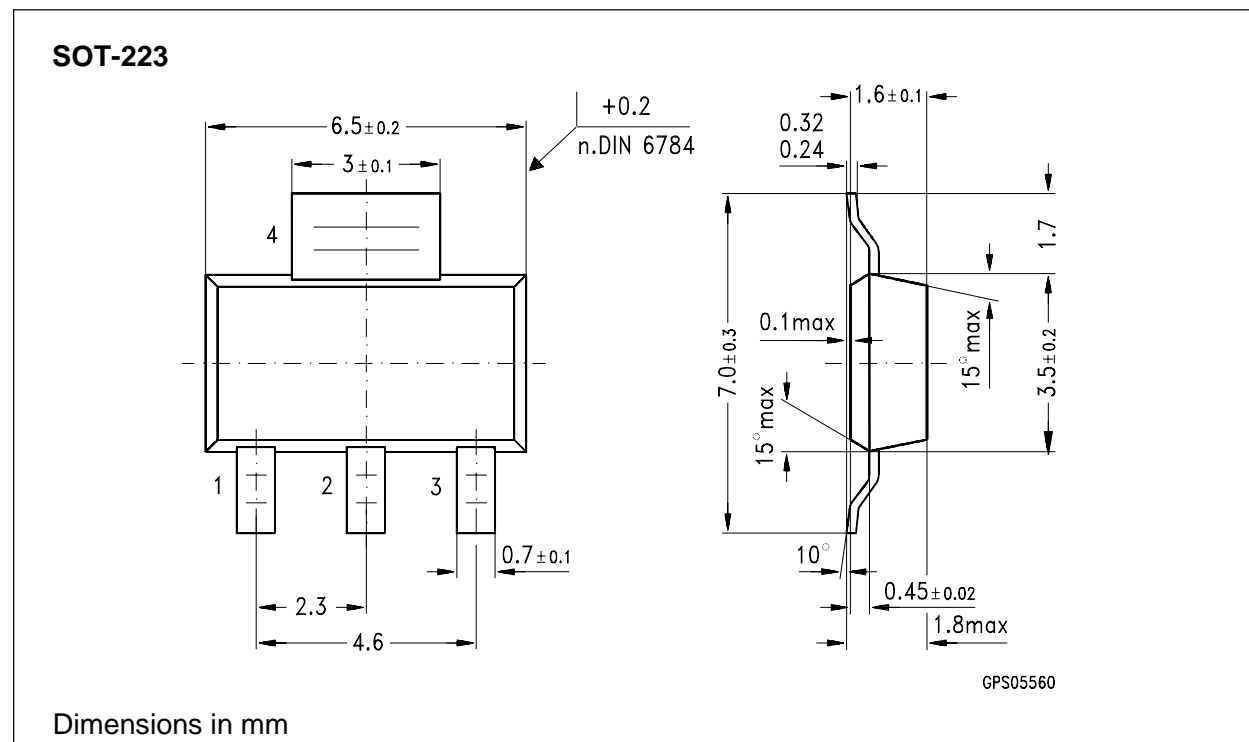
Forward transconductance $V_{CE} = 20\text{ V}, I_C = 1.5\text{ A}$	$g_{fs}$	–	0.6	–	S
Input capacitance $V_{CE} = 0, V_{GE} = 25\text{ V}, f = 1\text{ MHz}$	$C_{iss}$	–	225	–	pF
Output capacitance $V_{CE} = 0, V_{GE} = 25\text{ V}, f = 1\text{ MHz}$	$C_{oss}$	–	25	–	
Reverse transfer capacitance $V_{CE} = 0, V_{GE} = 25\text{ V}, f = 1\text{ MHz}$	$C_{rss}$	–	13	–	
Turn-on delay time $V_{CC} = 600\text{ V}, V_{GE} = 15\text{ V}, R_{G(on)} = 25\text{ }\Omega, I_C = 1.5\text{ A}$	$t_{d(on)}$	–	20	–	ns
Rise time $V_{CC} = 600\text{ V}, V_{GE} = 15\text{ V}, R_{G(on)} = 25\text{ }\Omega, I_C = 1.5\text{ A}$	$t_r$	–	15	–	

## Electrical Characteristics (cont'd)

at  $T_j = 25\text{ }^\circ\text{C}$ , unless otherwise specified.

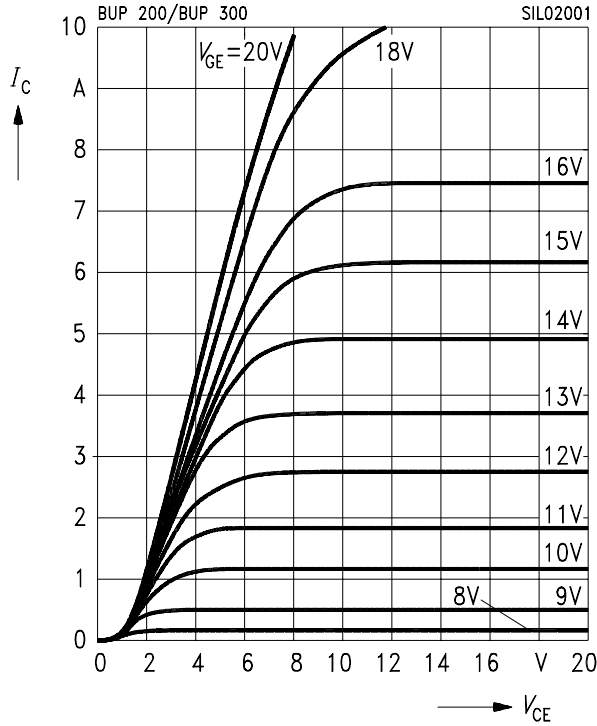
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Turn-on losses $V_{CC} = 600\text{ V}$ , $V_{GE} = 15\text{ V}$ , $R_{G(\text{off})} = 25\text{ }\Omega$ , $I_C = 1.5\text{ A}$	$E_{\text{on}}$	–	0.3	–	mWs
Turn-off delay time $V_{CC} = 600\text{ V}$ , $V_{GE} = 15\text{ V}$ , $R_{G(\text{off})} = 25\text{ }\Omega$ , $I_C = 1.5\text{ A}$	$t_{d(\text{off})}$	–	120	–	ns
Fall time $V_{CC} = 600\text{ V}$ , $V_{GE} = 15\text{ V}$ , $R_{G(\text{off})} = 25\text{ }\Omega$ , $I_C = 1.5\text{ A}$	$t_f$	–	20	–	ns
Total turn-off losses $V_{CC} = 600\text{ V}$ , $V_{GE} = 15\text{ V}$ , $R_{G(\text{off})} = 25\text{ }\Omega$ , $I_C = 1.5\text{ A}$	$E_{\text{off}}$	–	0.2	–	mWs

## Package Outline

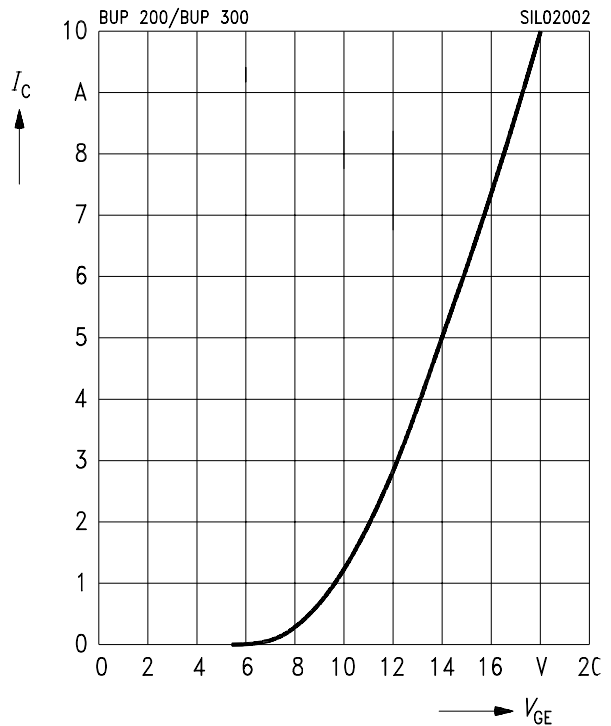


**Characteristics**  
at  $T_j = 25\text{ }^\circ\text{C}$ , unless otherwise specified.

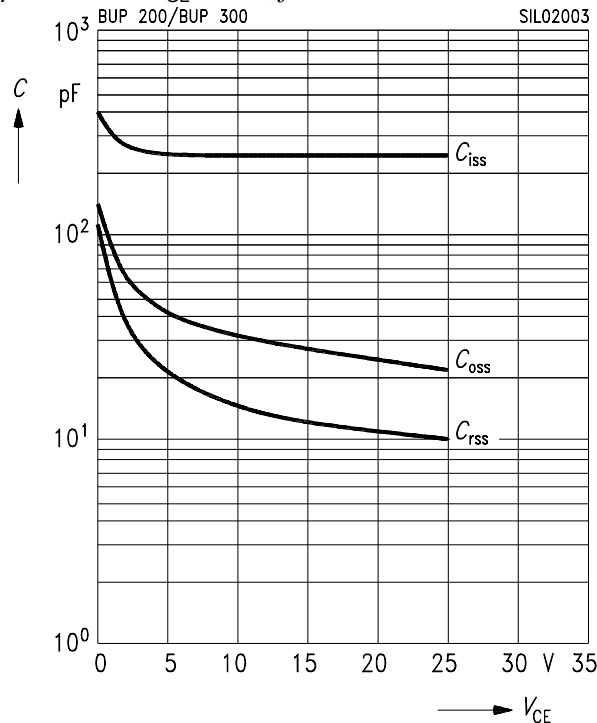
**Typ. output characteristics**  $I_C = f(V_{CE})$   
parameter:  $t_p = 80\text{ }\mu\text{s}$



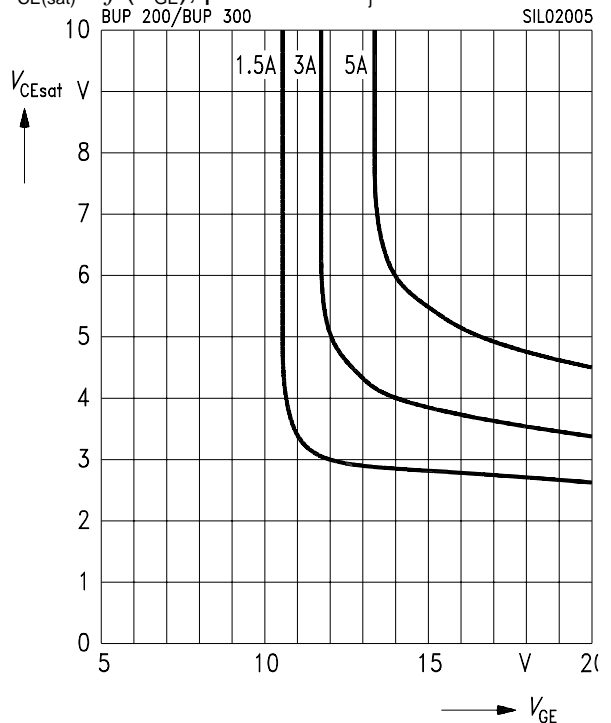
**Typ. transfer characteristics**  $I_C = f(V_{GE})$   
parameter:  $t_p = 80\text{ }\mu\text{s}$ ,  $V_{CE} = 20\text{ V}$



**Typ. capacitances**  $C = f(V_{CE})$   
parameter:  $V_{GE} = 0\text{ V}$ ,  $f = 1\text{ MHz}$

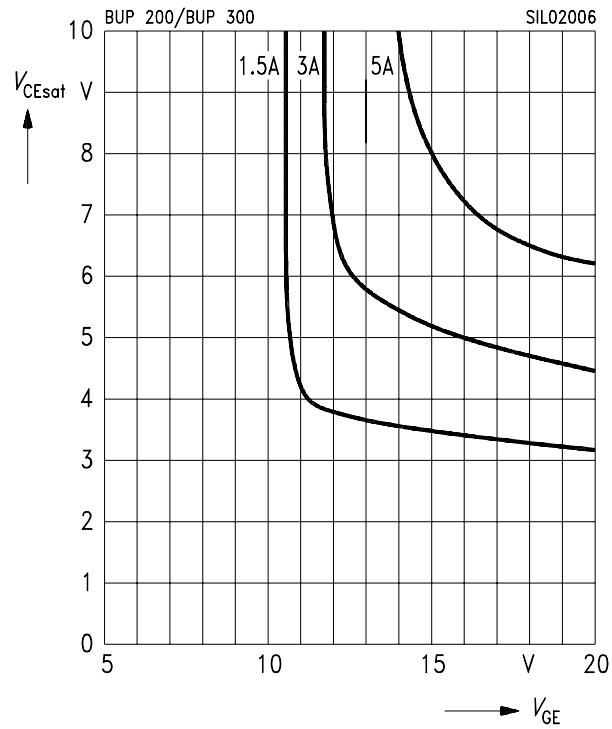


**Typ. saturation characteristics**  
 $V_{CE(sat)} = f(V_{GE})$ ; parameter:  $T_j = 25\text{ }^\circ\text{C}$



### Typ. saturation characteristic

$V_{CE(sat)} = f(V_{GE})$ ; parameter:  $T_j = 125\text{ °C}$



### Typ. gate charge $V_{GE} = f(Q_{Gate})$

parameter:  $I_{C plus} = 1\text{ A}$

