SIEMENS

Preliminary data

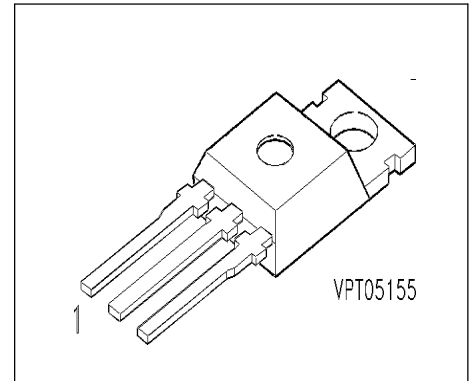**IGBT**

• Low forward voltage drop

• High switching speed

• Low tail current

• Latch-up free

• Avalanche rated

Pin 1	Pin 2	Pin 3
G	C	E

Type	V_{CE}	I_C	Package	Ordering Code
SGP15N60	600V	15A	TO-220 AB	Q67040-A . . . .

Maximum Ratings

Parameter	Symbol	Values	Unit
Collector-emitter voltage	V_{CE}	600	V
Collector-gate voltage $R_{GE} = 20\ k\Omega$	V_{CGR}	600	
Gate-emitter voltage	V_{GE}	± 20	
DC collector current $T_C = 25\ °C$ $T_C = 100\ °C$	I_C	 31 15	A
Pulsed collector current, $t_p = 1\ ms$ $T_C = 25\ °C$ $T_C = 100\ °C$	I_{Cpuls}	 62 30	
Avalanche energy, single pulse $I_C = 15\ A$, $V_{CC} = 50\ V$, $R_{GE} = 25\ \Omega$ $L = 200\ \mu H$, $T_j = 25\ °C$	E_{AS}	 24	mJ
Power dissipation $T_C = 25\ °C$	P_{tot}	 135	W

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Maximum Ratings

Parameter	Symbol	Values	Unit
Chip or operating temperature	T_j	-55 ... + 150	°C
Storage temperature	T_{stg}	-55 ... + 150	
IEC climatic category, DIN IEC 68-1	-	55 / 150 / 56	-

Thermal Resistance

Parameter	Symbol	Values	Unit
Thermal resistance, junction - case	R_{thJC}	≤ 0.9	K/W

Electrical Characteristics, at T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	

Static Characteristics

Parameter	Symbol	min.	typ.	max.	Unit
Collector-emitter breakdown voltage	$V_{(BR)CES}$				V
V_{GE} = 0 V, I_C = 0.5 mA, T_j = -55 °C		600	-	-	
Gate threshold voltage	$V_{GE(th)}$				
V_{GE} = V_{CE}, I_C = 0.4 mA, T_j = 25 °C		3	4	5	
V_{GE} = V_{CE}, I_C = 0.4 mA, T_j = 150 °C		2	3	-	
Collector-emitter saturation voltage	$V_{CE(sat)}$				
V_{GE} = 15 V, I_C = 15 A, T_j = 25 °C		1.6	2	2.5	
V_{GE} = 15 V, I_C = 15 A, T_j = 150 °C		-	2.3	2.8	
Zero gate voltage collector current	I_{CES}				µA
V_{CE} = 600 V, V_{GE} = 0 V, T_j = 25 °C		-	-	40	
V_{CE} = 600 V, V_{GE} = 0 V, T_j = 150 °C		-	-	2000	
Gate-emitter leakage current	I_{GES}				nA
V_{GE} = 25 V, V_{CE} = 0 V		-	-	100	

Electrical Characteristics, at T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
AC Characteristics					
Transconductance V_{CE} = 20 V, I_C = 15 A	g_{fs}	3	11	-	S
Input capacitance V_{CE} = 25 V, V_{GE} = 0 V, f = 1 MHz	C_{iss}	-	800	1100	pF
Output capacitance V_{CE} = 25 V, V_{GE} = 0 V, f = 1 MHz	C_{oss}	-	85	110	
Reverse transfer capacitance V_{CE} = 25 V, V_{GE} = 0 V, f = 1 MHz	C_{rss}	-	50	65	

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Electrical Characteristics, at T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Switching Characteristics, Inductive Load at T_j = 150 °C					
Turn-on delay time V_{CC} = 400 V, V_{GE} = 15 V, I_C = 15 A R_{Gon} = 21 Ω	$t_{d(on)}$	-	25	40	ns
Rise time V_{CC} = 400 V, V_{GE} = 15 V, I_C = 15 A R_{Gon} = 21 Ω	t_r	-	30	45	
Turn-off delay time V_{CC} = 400 V, V_{GE} = 15 V, I_C = 15 A R_{Goff} = 21 Ω	$t_{d(off)}$	-	260	390	
Fall time V_{CC} = 400 V, V_{GE} = 15 V, I_C = 15 A R_{Goff} = 21 Ω	t_f	-	55	85	
Total turn-on loss energy * V_{CC} = 400 V, V_{GE} = 15 V, I_C = 15 A R_{Gon} = 21 Ω, T_j = 150 °C	E_{on}	-	0.92	1.2	mJ
Total turn-off loss energy V_{CC} = 400 V, V_{GE} = 15 V, I_C = 15 A R_{Goff} = 21 Ω, T_j = 150 °C	E_{off}	-	0.41	0.53	
Total Gate Charge V_{CC} = 480 V, V_{GE} = 15 V, I_C = 15 A	$Q_{G(on)}$	-	73	110	nC

* includes the reverse recovery losses caused by the FWD of the BUP602D

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Package Outlines

Dimensions in mm

Weight:

GPT05155
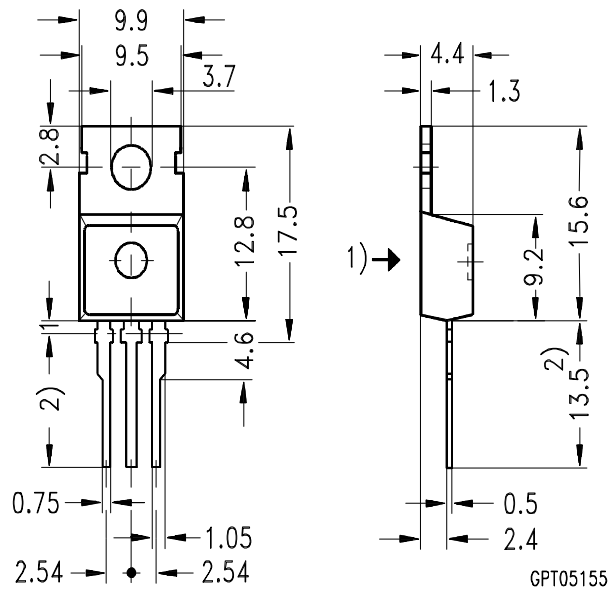
1) punch direction, burr max. 0.04
2) dip tinning
3) max. 14.5 by dip tinning press burr max. 0.05