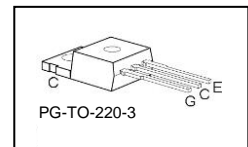
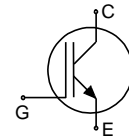


Low Loss IGBT : IGBT in TRENCHSTOP™ and Fieldstop technology



Features:

- Very low $V_{CE(sat)}$ 1.5V (typ.)
- Maximum Junction Temperature 175°C
- Short circuit withstand time 5 μ s
- Designed for :
 - Variable Speed Drive for washing machines and air conditioners
 - induction cooking
 - Uninterrupted Power Supply
- TRENCHSTOP™ and Fieldstop technology for 600V applications offers :
 - very tight parameter distribution
 - high ruggedness, temperature stable behaviour
- NPT technology offers easy parallel switching capability due to positive temperature coefficient in $V_{CE(sat)}$
- Low EMI
- Low Gate Charge
- Qualified according to JEDEC¹ for target applications
- Pb-free lead plating; RoHS compliant
- Complete product spectrum and PSpice Models : <http://www.infineon.com/igbt/>



Type	V_{CE}	I_C	$V_{CE(sat), T_j=25^\circ C}$	$T_{j,max}$	Marking Code	Package
IGP10N60T	600V	10A	1.5V	175°C	G10T60	PG-TO-220-3

Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-emitter voltage, $T_j \geq 25^\circ C$	V_{CE}	600	V
DC collector current, limited by $T_{j,max}$	I_C	24	A
$T_C = 25^\circ C$		18	
$T_C = 100^\circ C$			
Pulsed collector current, t_p limited by $T_{j,max}$	$I_{C,puls}$	30	
Turn off safe operating area, $V_{CE} = 600V$, $T_j = 175^\circ C$, $t_p = 1\mu s$	-	30	
Gate-emitter voltage	V_{GE}	± 20	V
Short circuit withstand time ²⁾	t_{SC}	5	μs
$V_{GE} = 15V$, $V_{CC} \leq 400V$, $T_j \leq 150^\circ C$			
Power dissipation $T_C = 25^\circ C$	P_{tot}	110	W
Operating junction temperature	T_j	-40...+175	°C
Storage temperature	T_{stg}	-55...+150	
Soldering temperature, 1.6mm (0.063 in.) from case for 10s		260	

¹ J-STD-020 and JESD-022

²⁾ Allowed number of short circuits: <1000; time between short circuits: >1s.

Thermal Resistance

Parameter	Symbol	Conditions	Max. Value	Unit
Characteristic				
IGBT thermal resistance, junction – case	R_{thJC}		1.35	K/W
Thermal resistance, junction – ambient	R_{thJA}		62	

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

Parameter	Symbol	Conditions	Value			Unit	
			min.	typ.	max.		
Static Characteristic							
Collector-emitter breakdown voltage	$V_{(BR)CES}$	$V_{GE}=0V, I_C=0.2mA$	600	-	-	V	
Collector-emitter saturation voltage	$V_{CE(sat)}$	$V_{GE} = 15V, I_C=10A$	-	1.5	2.05		
		$T_j=25\text{ °C}$	-	1.8	-		
Gate-emitter threshold voltage	$V_{GE(th)}$	$I_C=0.3mA, V_{CE}=V_{GE}$	4.1	4.6	5.7		
Zero gate voltage collector current	I_{CES}	$V_{CE}=600V, V_{GE}=0V$	$T_j=25\text{ °C}$	-	-	40	μA
			$T_j=175\text{ °C}$	-	-	1000	
Gate-emitter leakage current	I_{GES}	$V_{CE}=0V, V_{GE}=20V$	-	-	100	nA	
Transconductance	g_{fs}	$V_{CE}=20V, I_C=10A$	-	6	-	S	
Integrated gate resistor	R_{Gint}		none			Ω	

Dynamic Characteristic

Input capacitance	C_{iss}	$V_{CE}=25V, V_{GE}=0V, f=1MHz$	-	551	-	pF
Output capacitance	C_{oss}		-	40	-	
Reverse transfer capacitance	C_{rss}		-	17	-	
Gate charge	Q_{Gate}	$V_{CC}=480V, I_C=10A, V_{GE}=15V$	-	62	-	nC
Internal emitter inductance measured 5mm (0.197 in.) from case	L_E	TO-220-3-1	-	7	-	nH
Short circuit collector current ¹⁾	$I_{C(SC)}$	$V_{GE}=15V, t_{SC}\leq 5\mu s, V_{CC}=400V, T_j=25\text{ °C}$	-	100	-	A

¹⁾ Allowed number of short circuits: <1000; time between short circuits: >1s.