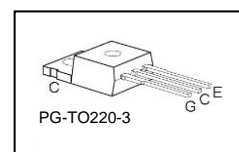
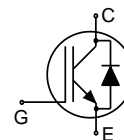


Low Loss DuoPack : IGBT in TRENCHSTOP™ and Fieldstop technology with soft, fast recovery anti-parallel Emitter Controlled HE diode


Features:

- Very low $V_{CE(sat)}$ 1.5V (typ.)
- Maximum Junction Temperature 175°C
- Short circuit withstand time 5 μ s
- Designed for :
 - Frequency Converters
 - Uninterrupted Power Supply
- TRENCHSTOP™ and Fieldstop technology for 600V applications offers :
 - very tight parameter distribution
 - high ruggedness, temperature stable behavior
 - very high switching speed
 - low $V_{CE(sat)}$
- Positive temperature coefficient in $V_{CE(sat)}$
- Low EMI
- Low Gate Charge
- Very soft, fast recovery anti-parallel Emitter Controlled HE diode
- 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	Package
IKP20N60T	600V	20A	1.5V	175°C	K20T60	PG-TO220-3

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	$T_C = 25^\circ C$	41	
		$T_C = 100^\circ C$	28	
Pulsed collector current, t_p limited by $T_{j,max}$	$I_{C,puls}$	60	A	
Turn off safe operating area, $V_{CE} = 600V$, $T_j = 175^\circ C$, $t_p = 1\mu s$	-	60		
Diode forward current, limited by $T_{j,max}$	I_F	$T_C = 25^\circ C$		41
		$T_C = 100^\circ C$		28
Diode pulsed current, t_p limited by $T_{j,max}$	$I_{F,puls}$	60		
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}	166	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}		0.9	K/W
Diode thermal resistance, junction – case	R_{thJCD}		1.5	
Thermal resistance, junction – ambient	R_{thJA}		62	

Electrical Characteristic, at $T_j = 25^\circ\text{C}$, 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	$V_{CE(sat)}$	$V_{GE} = 15V, I_C=20A$ $T_j=25^\circ\text{C}$ $T_j=175^\circ\text{C}$	-	1.5	2.05	
Diode forward voltage	V_F	$V_{GE}=0V, I_F=20A$ $T_j=25^\circ\text{C}$ $T_j=175^\circ\text{C}$	-	1.65	2.05	
			-	1.6	-	
Gate-emitter threshold voltage	$V_{GE(th)}$	$I_C=290\mu A, V_{CE}=V_{GE}$	4.1	4.9	5.7	
Zero gate voltage collector current	I_{CES}	$V_{CE}=600V,$ $V_{GE}=0V$ $T_j=25^\circ\text{C}$ $T_j=175^\circ\text{C}$	-	-	40	μA
			-	-	1500	
Gate-emitter leakage current	I_{GES}	$V_{CE}=0V, V_{GE}=20V$	-	-	100	nA
Transconductance	g_{fs}	$V_{CE}=20V, I_C=20A$	-	11	-	S
Integrated gate resistor	R_{Gint}			-		Ω

Dynamic Characteristic

Input capacitance	C_{iss}	$V_{CE}=25V,$ $V_{GE}=0V,$ $f=1MHz$	-	1100	-	μF
Output capacitance	C_{oss}		-	71	-	
Reverse transfer capacitance	C_{riss}		-	32	-	
Gate charge	Q_{Gate}	$V_{CC}=480V, I_C=20A$ $V_{GE}=15V$	-	120	-	nC
Internal emitter inductance measured 5mm (0.197 in.) from case	L_E	PG-TO220-3	-	7	-	nH
Short circuit collector current ¹⁾	$I_{C(SC)}$	$V_{GE}=15V, t_{SC}\leq 5\mu s$ $V_{CC} = 400V,$ $T_j \leq 150^\circ\text{C}$	-	183.3	-	A

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