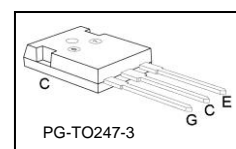
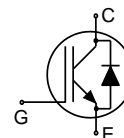


Low Loss DuoPack : IGBT in TRENCHSTOP™ and Fieldstop technology with soft, fast recovery anti-parallel Emitter Controlled HE diode



**Features:**

- Very low  $V_{CE(sat)}$  1.5V (typ.)
- Maximum Junction Temperature 175°C
- Short circuit withstand time 5 $\mu$ 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 JEDEC<sup>1</sup> 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
IKW20N60T	600V	20A	1.5V	175°C	K20T60	PG-TO247-3

**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	$V_{GE}$	$\pm 20$	V	
Short circuit withstand time <sup>2)</sup>	$t_{SC}$	5	$\mu s$	
$V_{GE} = 15V$ , $V_{CC} \leq 400V$ , $T_j \leq 150^\circ C$				
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		

<sup>1</sup> J-STD-020 and JESD-022

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

### Thermal Resistance

Parameter	Symbol	Conditions	Max. Value	Unit
<b>Characteristic</b>				
IGBT thermal resistance, junction – case	$R_{thJC}$		0.9	K/W
Diode thermal resistance, junction – case	$R_{thJCD}$		1.5	
Thermal resistance, junction – ambient	$R_{thJA}$		40	

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

Parameter	Symbol	Conditions	Value			Unit
			min.	Typ.	max.	
<b>Static Characteristic</b>						
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 1.9	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 1.6	2.05 -	
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 1500	$\mu A$
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	$R_{Gint}$			-		$\Omega$

### Dynamic Characteristic

Input capacitance	$C_{iss}$	$V_{CE}=25V,$ $V_{GE}=0V,$ $f=1MHz$	-	1100	-	pF
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-TO247-3	-	13	-	nH
Short circuit collector current <sup>1)</sup>	$I_{C(SC)}$	$V_{GE}=15V, t_{SC}\leq 5\mu s$ $V_{CC} = 400V,$ $T_j \leq 150^\circ\text{C}$	-	183.3	-	A

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