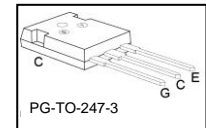
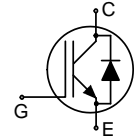


**Low Loss DuoPack : IGBT in 2<sup>nd</sup> generation TRENCHSTOP™ with soft, fast recovery anti-parallel Emitter Controlled Diode**

- Best in class TO247
- Short circuit withstand time – 10μs
- Designed for :
  - Frequency Converters
  - Uninterrupted Power Supply
- TRENCHSTOP™ 2<sup>nd</sup> generation for 1200 V applications offers :
  - very tight parameter distribution
  - high ruggedness, temperature stable behavior
- Easy paralleling capability due to 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 Code	Package
IKW40N120T2	1200V	40A	1.75V	175°C	K40T1202	PG-TO-247-3

### Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-emitter voltage	$V_{CE}$	1200	V
DC collector current ( $T_j=150^\circ C$ )	$I_C$	75 <sup>2</sup>	A
$T_C = 25^\circ C$		40	
$T_C = 110^\circ C$			
Pulsed collector current, $t_p$ limited by $T_{j,max}$	$I_{C,puls}$	160	
Turn off safe operating area	-	160	
$V_{CE} \leq 1200V, T_j \leq 175^\circ C$			
DC Diode forward current ( $T_j=150^\circ C$ )	$I_F$	75 <sup>2</sup>	
$T_C = 25^\circ C$		40	
$T_C = 110^\circ C$			
Diode pulsed current, $t_p$ limited by $T_{j,max}$	$I_{F,puls}$	160	
Gate-emitter voltage	$V_{GE}$	$\pm 20$	V
Short circuit withstand time <sup>3)</sup>	$t_{SC}$	10	μs
$V_{GE} = 15V, V_{CC} \leq 600V, T_{j,start} \leq 175^\circ C$			
Power dissipation	$P_{tot}$	480	W
$T_C = 25^\circ C$			
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	
Wavesoldering only, temperature on leads only			

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

<sup>2</sup> Limited by bond wire

<sup>3)</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	$R_{thJC}$		0.31	K/W
Diode thermal resistance, junction – case	$R_{thJCD}$		0.53	
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	$V_{(BR)CES}$	$V_{GE}=0V, I_C=500\mu A$	1200	-	-	V
Collector-emitter saturation voltage	$V_{CE(sat)}$	$V_{GE} = 15V, I_C=40A$ $T_j=25^\circ\text{C}$ $T_j=150^\circ\text{C}$ $T_j=175^\circ\text{C}$	-	1.75	2.2	
			-	2.25	-	
			-	2.3	-	
Diode forward voltage	$V_F$	$V_{GE}=0V, I_F=40A$ $T_j=25^\circ\text{C}$ $T_j=150^\circ\text{C}$ $T_j=175^\circ\text{C}$	-	1.75	2.2	
			-	1.80	-	
			-	1.80	-	
Gate-emitter threshold voltage	$V_{GE(th)}$	$I_C=1.5mA, V_{CE}=V_{GE}$	5.2	5.8	6.4	
Zero gate voltage collector current	$I_{CES}$	$V_{CE}=1200V, V_{GE}=0V$ $T_j=25^\circ\text{C}$ $T_j=150^\circ\text{C}$ $T_j=175^\circ\text{C}$	-	-	0.4	mA
			-	-	4.0	
			-	-	20	
Gate-emitter leakage current	$I_{GES}$	$V_{CE}=0V, V_{GE}=20V$	-	-	200	nA
Transconductance	$g_{fs}$	$V_{CE}=20V, I_C=40A$	-	21	-	S