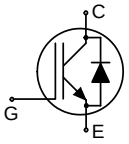
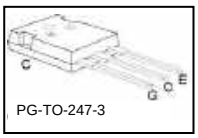
IKW40N120T2

TRENCHSTOP™ 2nd Generation Series

Low Loss DuoPack : IGBT in 2nd 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™ 2nd 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[1] 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	$V_{CE(sat),Tj=25°C}$	$T_{j,max}$	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°C)	I_C		A
T_C = 25°C		75[2]	
T_C = 110°C		40	
Pulsed collector current, t_p limited by T_{jmax}	I_{Cpuls}	160	
Turn off safe operating area	-	160	
$V_{CE} \le 1200V$, $T_j \le 175°C$			
DC Diode forward current (T_j=150°C)	I_F		
T_C = 25°C		75[2]	
T_C = 110°C		40	
Diode pulsed current, t_p limited by T_{jmax}	I_{Fpuls}	160	
Gate-emitter voltage	V_{GE}	±20	V
Short circuit withstand time[3)]	t_{SC}	10	µs
V_{GE} = 15V, $V_{CC} \le 600V$, $T_{j,start} \le 175°C$			
Power dissipation	P_{tot}	480	W
T_C = 25°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			

[1] J-STD-020 and JESD-022
[2] Limited by bond wire
[3)] 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}		0.31	K/W
Diode thermal resistance, junction – case	R_{thJCD}		0.53	
Thermal resistance, junction – ambient	R_{thJA}		40	

Electrical Characteristic, at T_j = 25 °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=500µA	1200	-	-	V
Collector-emitter saturation voltage	$V_{CE(sat)}$	V_{GE} = 15V, I_C=40A				
		T_j=25°C	-	1.75	2.2	
		T_j=150°C	-	2.25	-	
		T_j=175°C	-	2.3	-	
Diode forward voltage	V_F	V_{GE}=0V, I_F=40A				
		T_j=25°C	-	1.75	2.2	
		T_j=150°C	-	1.80	-	
		T_j=175°C	-	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				mA
		T_j=25°C	-	-	0.4	
		T_j=150°C	-	-	4.0	
		T_j=175°C	-	-	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