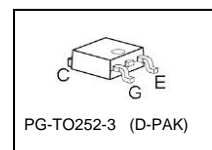
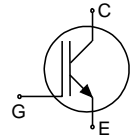


Low Loss IGBT: IGBT in TRENCHSTOP™ and Fieldstop technology



### Features:

- Very low  $V_{CE(sat)}$  1.5 V (typ.)
- Maximum Junction Temperature 175°C
- Short circuit withstand time 5 $\mu$ s
- TRENCHSTOP™ and Fieldstop technology for 600V applications offers :
  - very tight parameter distribution
  - high ruggedness, temperature stable behavior
- Low EMI
- 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/>



### Applications:

- Variable Speed Drive for washing machines and air conditioners
- Buck converters

Type	$V_{CE}$	$I_C; T_C=100^\circ\text{C}$	$V_{CE(sat), T_j=25^\circ\text{C}}$	$T_{j,max}$	Marking	Package
IGD06N60T	600V	6A	1.5V	175°C	G06T60	PG-TO252-3

### Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-emitter voltage, $T_j \geq 25^\circ\text{C}$	$V_{CE}$	600	V
DC collector current, limited by $T_{j,max}$ $T_C = 25^\circ\text{C}$ $T_C = 100^\circ\text{C}$	$I_C$	12 6	A
Pulsed collector current, $t_p$ limited by $T_{j,max}$	$I_{C,puls}$	18	
Turn off safe operating area, $V_{CE} = 600\text{V}$ , $T_j = 175^\circ\text{C}$ , $t_p = 1\mu\text{s}$	-	18	
Gate-emitter voltage	$V_{GE}$	$\pm 20$	V
Short circuit withstand time <sup>2)</sup> $V_{GE} = 15\text{V}$ , $V_{CC} \leq 400\text{V}$ , $T_j \leq 150^\circ\text{C}$	$t_{SC}$	5	$\mu\text{s}$
Power dissipation $T_C = 25^\circ\text{C}$	$P_{tot}$	88	W
Operating junction temperature	$T_j$	-40...+175	
Storage temperature	$T_{stg}$	-55...+150	°C
Soldering temperature reflow soldering, MSL1		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	$R_{thJC}$		1.7	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.	
<b>Static Characteristic</b>						
Collector-emitter breakdown voltage	$V_{(BR)CES}$	$V_{GE}=0V$ , $I_C=0.25mA$	600	-	-	V
Collector-emitter saturation voltage	$V_{CE(sat)}$	$V_{GE} = 15V$ , $I_C=6A$ $T_j=25\text{ °C}$ $T_j=175\text{ °C}$	-	1.5	2.05	
Gate-emitter threshold voltage	$V_{GE(th)}$	$I_C=0.18mA$ , $V_{CE}=V_{GE}$	4.1	4.6	5.7	
Zero gate voltage collector current	$I_{CES}$	$V_{CE}=600V$ , $V_{GE}=0V$ $T_j=25\text{ °C}$ $T_j=175\text{ °C}$	-	-	40	$\mu A$
			-	-	700	
Gate-emitter leakage current	$I_{GES}$	$V_{CE}=0V$ , $V_{GE}=20V$	-	-	100	nA
Transconductance	$g_{fs}$	$V_{CE}=20V$ , $I_C=6A$	-	3.6	-	S
Integrated gate resistor	$R_{Gint}$		none			$\Omega$

### Dynamic Characteristic

Input capacitance	$C_{iss}$	$V_{CE}=25V$ , $V_{GE}=0V$ , $f=1MHz$	-	368	-	pF
Output capacitance	$C_{oss}$		-	28	-	
Reverse transfer capacitance	$C_{riss}$		-	11	-	
Gate charge	$Q_{Gate}$	$V_{CC}=480V$ , $I_C=6A$ $V_{GE}=15V$	-	42	-	nC
Internal emitter inductance measured 5mm (0.197 in.) from case	$L_E$		-	7	-	nH
Short circuit collector current <sup>1)</sup>	$I_{C(SC)}$	$V_{GE}=15V$ , $t_{SC}\leq 5\mu s$ $V_{CC} = 400V$ , $T_j = 25\text{ °C}$	-	55	-	A

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