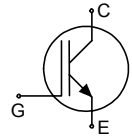


High Speed IGBT in NPT-technology

- 30% lower E_{off} compared to previous generation
- Short circuit withstand time – 10 μ s
- Designed for operation above 30 kHz
- NPT-Technology for 600V applications offers:
 - parallel switching capability
 - moderate E_{off} increase with temperature
 - very tight parameter distribution
- High ruggedness, temperature stable behaviour
- Pb-free lead plating; RoHS compliant
- Qualified according to JEDEC¹ for target applications
- Complete product spectrum and PSpice Models : <http://www.infineon.com/igbt/>



Type	V_{CE}	I_C	E_{off25}	T_j	Marking	Package
SGW50N60HS	600V	50A	0.88mJ	150°C	G50N60HS	PG-TO-247-3-21

Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-emitter voltage	V_{CE}	600	V
DC collector current	I_C	100	A
$T_C = 25^\circ\text{C}$		50	
$T_C = 100^\circ\text{C}$			
Pulsed collector current, t_p limited by T_{jmax}	I_{Cpuls}	150	
Turn off safe operating area	-	150	
$V_{CE} \leq 600\text{V}, T_j \leq 150^\circ\text{C}$			
Avalanche energy single pulse	E_{AS}	280	mJ
$I_C = 50\text{A}, V_{CC}=50\text{V}, R_{GE}=25\Omega$ start $T_j=25^\circ\text{C}$			
Gate-emitter voltage static	V_{GE}	± 20	V
transient ($t_p < 1\mu\text{s}, D < 0.05$)		± 30	
Short circuit withstand time ²⁾	t_{SC}	10	μs
$V_{GE} = 15\text{V}, V_{CC} \leq 600\text{V}, T_j \leq 150^\circ\text{C}$			
Power dissipation	P_{tot}	416	W
$T_C = 25^\circ\text{C}$			
Operating junction and storage temperature	T_j, T_{stg}	-55...+150	$^\circ\text{C}$
Time limited operating junction temperature for $t < 150\text{h}$	$T_{j(tl)}$	175	
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}		0.3	K/W
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.	
Static Characteristic						
Collector-emitter breakdown voltage	$V_{(BR)CES}$	$V_{GE}=0V, I_C=500\mu A$	600	-	-	V
Collector-emitter saturation voltage	$V_{CE(sat)}$	$V_{GE} = 15V, I_C=50A$ $T_j=25^{\circ}C$ $T_j=150^{\circ}C$	- - -	2.8 3.15	3.15 -	
Gate-emitter threshold voltage	$V_{GE(th)}$	$I_C=1mA, V_{CE}=V_{GE}$	3	4	5	
Zero gate voltage collector current	I_{CES}	$V_{CE}=600V, V_{GE}=0V$ $T_j=25^{\circ}C$ $T_j=150^{\circ}C$	- - -	- -	40 3000	
Gate-emitter leakage current	I_{GES}	$V_{CE}=0V, V_{GE}=20V$	-	-	100	nA
Transconductance	g_{fs}	$V_{CE}=20V, I_C=50A$	-	31	-	S

Dynamic Characteristic

Input capacitance	C_{iss}	$V_{CE}=25V,$ $V_{GE}=0V,$ $f=1MHz$	-	2572	-	pF
Output capacitance	C_{oss}		-	245	-	
Reverse transfer capacitance	C_{rss}		-	158	-	
Gate charge	Q_{Gate}	$V_{CC}=480V, I_C=50A$ $V_{GE}=15V$	-	179	-	nC
Internal emitter inductance measured 5mm (0.197 in.) from case	L_E		-	13	-	nH
Short circuit collector current ¹⁾	$I_{C(SC)}$	$V_{GE}=15V, t_{SC}\leq 10\mu s$ $V_{CC}\leq 600V,$ $T_j\leq 150^\circ\text{C}$	-	471	-	A

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