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NCE15G135T

1350V, 15A, Trench NPT IGBT

Features

- Trench NPT(Non Punch Through) IGBT
- High speed switching
- Low saturation voltage: V_{CE(sat)}=2.0V@I_C=15A
- High input impedance

Applications

- Inductive heating, Microwave oven, Inverter, UPS, etc.
- Soft switching applications

General Description

Using advanced Trench NPT technology, NCE's 1350V IGBTs offers superior conduction and switching performances, and easy parallel operation with exceptional avalanche ruggedness. This device is designed for soft switching applications.





Absolute Maximum Ratings

Symbol	Description	Ratings	Units
V _{CES}	Collector to Emitter Voltage	1350	V
V _{GES}	Gate to Emitter Voltage	+/-30	V
Ι _C	Continuous Collector Current @T _c =25°C	30	А
	Continuous Collector Current @T _c =100°C	15	А
I _{CM} (1)	Pulsed Collector Current	45	А
P _D	Maximum Power Dissipation @T _c =25°C	220	W
	Maximum Power Dissipation @T _c =100°C	88	W
TJ	Operating Junction Temperature	-55 to +150	°C
T _{stg}	Storage Temperature Range	-55 to +150	°C
TL	Maximum Lead Temp. for soldering Purposes, 1/8" from case for 5seconds	300	°C

Notes:

1. Repetitive rating, Pulse width limited by max. junction temperature



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Thermal Characteristics

Symbol	Parameter	Тур.	Max.	Units
R _{JC}	Thermal Resistance, Junction to Case	-	0.57	°C/W
R _{JA}	Thermal Resistance, Junction to Ambient	-	40	°C/W

Electrical Characteristics of the IGBT $\tau_{c=25^\circ\text{C}}$

Symbol	Parameter	Test Conditions	Min.	Тур.	Max.	Units
Off Characteristics						
BV _{CES}	Collector to Emitter		1050			V
	Breakdown Voltage	V _{GE} =0V, Ic=1mA	1350	-	-	V
I _{CES}	Collector Cut-Off Current	V _{CE} =V _{CES} , V _{GE} =0V	-	-	1	mA
I _{GES}	G-E Leakage Current	V _{GE} =V _{GES} , V _{CE} =0V	-	-	+/-250	nA
On Char	acteristics					
$V_{GE(th)}$	G-E Threshold Voltage	I _C =15mA, V _{CE} =V _{GE}	4.0	5.5	7.0	V
		I _C =15A, V _{GE} =15V		0	2.5	V
V.	Collector to Emitter Saturation	T _C =25°C	-	2	2.5	v
V CE(sat)	Voltage	I _C =15A, V _{GE} =15V		2 15	-	V
		T _C =125°C	-	2.15		V
Dynamic	Characteristics					
Cies	Input Capacitance		-	2350	-	pF
Coes	Output Capacitance	V_{CE} =30V, V_{GE} =0V,	-	70	-	pF
C	Reverse Transfer	f=1MHz		15		рĘ
Ores	Capacitance		-	43	-	р
Switchin	g Characteristics		_	-		_
t _{d(on)}	Turn-On Delay Time		-	33	-	ns
tr	Rise Time	Var=600V/La=15A	-	80	-	ns
t _{d(off)}	Turn-Off Delay Time	$V_{CC}=000V, I_{C}=15A,$ $P_{c}=100V, I_{c}=15V$	-	160	-	ns
t _f	Fall Time	Resistive Load	-	255	330	ns
Eon	Turn-On Switching Loss	$T_{c}=25^{\circ}C$	-	0.3	-	mJ
E _{off}	Turn-Off Switching Loss		-	0.58	0.74	mJ
E _{ts}	Total Switching Loss		-	0.88	-	mJ
t _{d(on)}	Turn-On Delay Time		-	30	-	ns
tr	Rise Time		-	115	-	ns
t _{d(off)}	Turn-Off Delay Time	$V_{CC}=600V, I_C=15A,$ $R_G=10\Omega, V_{GE}=15V,$ Resistive Load, $T_C=125^{\circ}C$	-	170	-	ns
t _f	Fall Time		-	390	-	ns
Eon	Turn-On Switching Loss		-	0.38	-	mJ
E _{off}	Turn-Off Switching Loss		-	0.89	-	mJ
E _{ts}	Total Switching Loss		-	1.27	-	mJ
Qg	Total Gate Charge	Vec=600V/L=15A	-	100	-	nC
Q_{ge}	Gate to Emitter Charge	$V_{CC} = 000V, I_{C} = 15A,$	-	19	-	nC
Q _{gc}	Gate to Collector Charge	v GE- 13 v	-	45	-	nC



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Typical Performance Characteristics

Figure 1. Typical Output Characteristics







Figure 5. Saturation Voltage vs. V_{GE}



Figure 2. Typical Saturation Voltage



Figure 4. Saturation Voltage vs. VGE



Figure 6. Capacitance Characteristics







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Typical Performance Characteristics (Continued)

Figure 7. Turn-on Characteristics vs. Gate











Figure 8. Turn-off Characteristics vs. Gate Resistance



Figure 10. Turn-on Characteristics vs. Collector Current



Figure 12. Switching Loss vs. Collector Current







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Typical Performance Characteristics (Continued)

Figure 13. Gate Charge Characteristics

Figure 14. SOA Characteristics









Figure 16. Transient Thermal Impedance of IGBT





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TO-247 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches		
Symbol	Min.	Max.	Min.	Max.	
А	4.850	5.150	0.191	0.200	
A1	2.200	2.600	0.087	0.102	
b	1.000	1.400	0.039	0.055	
b1	2.800	3.200	0.110	0.126	
b2	1.800	2.200	0.071	0.087	
С	0.500	0.700	0.020	0.028	
c1	1.900	2.100	0.075	0.083	
D	15.450	15.750	0.608	0.620	
E1	3.500 REF		0.138 REF		
E2	3.600 REF		0.142 REF		
L	40.900	41.300	1.610	1.626	
L1	24.800	25.100	0.976	0.988	
L2	20.300	20.600	0.799	0.811	
Ф	7.100	7.300	0.280	0.287	
e	5.450 TYP		0.215 TYP		
Н	5.980 REF		0.235 REF		

Pb Free Product

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