

3-Level NPC Inverter Module

Product Preview

NXH600N105H7F5S2HG, NXH600N105H7F5P2HG

The NXH600N105H7F5S2HG/P2HG is a power module in F5BP package containing an I-type neutral point clamped three-level inverter. The integrated field stop trench IGBTs and FRDs provide lower conduction and switching losses, enabling designers to achieve high efficiency, high power density and superior reliability.

Features

- I-type Neutral Point Clamped Three-level Inverter Module
- 1050 V Field Stop 7 IGBTs
- Low Inductive Layout
- Solder Pins and Press Fit Pins
- Integrated NTC Thermistor
- These Devices are Pb-Free, Halide Free and are RoHS Compliant

Typical Applications

- Energy Storage System
- Solar Inverter
- Uninterruptable Power Supplies Systems

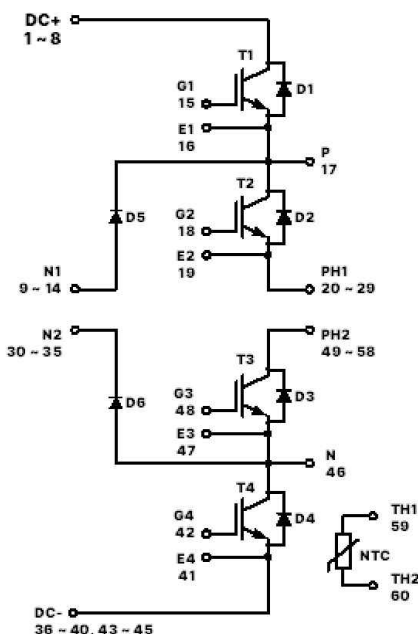
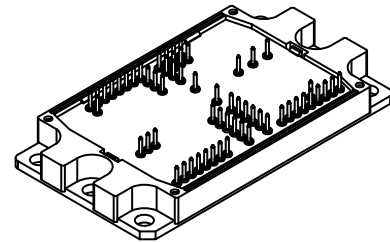
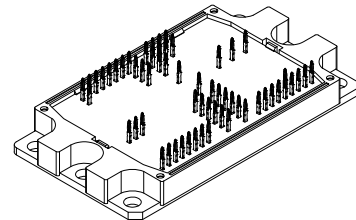


Figure 1. NXH600N105H7F5S2HG/P2HG Schematic Diagram

This document contains information on a product under development. onsemi reserves the right to change or discontinue this product without notice.

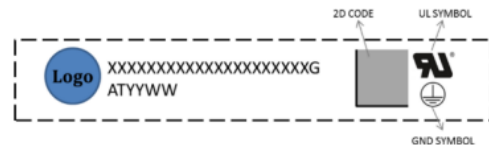


PIM60 112.00x62.00x12.00
CASE 180CW



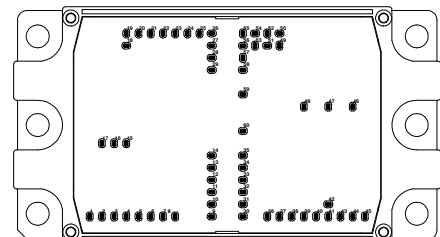
PIM60 112.00x62.00x12.00
CASE 180HY

MARKING DIAGRAM



XXXXX = Device Code
G = Pb-Free Package
AT = Assembly & Test Site Code
YYWW = Year and Work Week Code

PIN CONNECTIONS



ORDERING INFORMATION

See detailed ordering and shipping information on page 5 of this data sheet.

NXH600N105H7F5S2HG, NXH600N105H7F5P2HG

MODULE CHARACTERISTICS

Operating Temperature under Switching Condition	T_{VJOP}	-40 to 150	°C
Storage Temperature Range	T_{stg}	-40 to 125	°C
Isolation Test Voltage, $t = 2$ s, 50 Hz (Note 1)	V_{is}	4800	V_{RMS}
Stray Inductance	L_s CE	15	nH
Terminal Connection Torque (M5, Screw)	M	3 to 5	Nm
Weight	G	245	g
Creepage Distance (Terminal to Heatsink)		17.46	mm
Creepage Distance (Terminal to Terminal)		6.48	mm
Clearance Distance (Terminal to Heatsink)		15.62	mm
Clearance Distance (Terminal to Terminal)		5.05	mm
Comparative Tracking Index	CTI	>600	

1. 4800 V_{ACRMS} for 2 second duration is equivalent to 4000 V_{ACRMS} for 1 minute duration.

MAXIMUM RATINGS ($T_J = 25$ °C unless otherwise noted)

Symbol	Parameter	Value	Unit
--------	-----------	-------	------

OUTER IGBT (T1, T4)

V_{CES}	Collector-Emitter Voltage	1050	V
V_{GE}	Gate-Emitter Voltage Positive Transient Gate-Emitter Voltage ($T_{pulse} = 5$ ms, $D < 0.10$)	± 20 30	V
I_C	Continuous Collector Current @ $T_c = 80$ °C ($T_J = 175$ °C)	429	A
I_{Cpulse}	Pulsed Peak Collector Current @ $T_c = 80$ °C ($T_J = 175$ °C), $T_{pulse} = 1$ ms	1287	A
P_{tot}	Power Dissipation ($T_J = 175$ °C, $T_c = 80$ °C)	1080	W
T_{JMIN}	Minimum Operating Junction Temperature	-40	°C
T_{JMAX}	Maximum Operating Junction Temperature	175	°C

INNER IGBT (T2, T3)

V_{CES}	Collector-Emitter Voltage	1050	V
V_{GE}	Gate-Emitter Voltage Positive Transient Gate-Emitter Voltage ($T_{pulse} = 5$ ms, $D < 0.10$)	+20 30	V
I_C	Continuous Collector Current @ $T_c = 80$ °C ($T_J = 175$ °C)	433	A
I_{Cpulse}	Pulsed Peak Collector Current @ $T_c = 80$ °C ($T_J = 175$ °C), $T_{pulse} = 1$ ms	1299	A
P_{tot}	Power Dissipation ($T_J = 175$ °C, $T_c = 80$ °C)	1080	W
T_{JMIN}	Minimum Operating Junction Temperature	-40	°C
T_{JMAX}	Maximum Operating Junction Temperature	175	°C

SIC NEUTRAL POINT DIODE (D5, D6)

V_{RRM}	Peak Repetitive Reverse Voltage	1050	V
I_F	Continuous Forward Current @ $T_c = 80$ °C ($T_J = 175$ °C)	192	A
I_{FRM}	Repetitive Peak Forward Current ($T_J = 175$ °C), $T_{pulse} = 1$ ms	576	A
P_{tot}	Maximum Power Dissipation @ $T_c = 80$ °C ($T_J = 175$ °C)	419	W
T_{JMIN}	Minimum Operating Junction Temperature	-40	°C
T_{JMAX}	Maximum Operating Junction Temperature	175	°C

INVERSE DIODES (D1, D2, D3, D4)

V_{RRM}	Peak Repetitive Reverse Voltage	1050	V
I_F	Continuous Forward Current @ $T_c = 80$ °C ($T_J = 175$ °C)	196	A
I_{FRM}	Repetitive Peak Forward Current ($T_J = 175$ °C), $T_{pulse} = 1$ ms	588	A

NXH600N105H7F5S2HG, NXH600N105H7F5P2HG

MAXIMUM RATINGS (T_J = 25 °C unless otherwise noted) (continued)

Symbol	Parameter	Value	Unit
INVERSE DIODES (D1, D2, D3, D4)			
P _{tot}	Maximum Power Dissipation @ T _c = 80 °C (T _J = 175 °C)	434	W
T _{JMIN}	Minimum Operating Junction Temperature	-40	°C
T _{JMAX}	Maximum Operating Junction Temperature	175	°C

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

2. Refer to ELECTRICAL CHARACTERISTICS, RECOMMENDED OPERATING RANGES and/or APPLICATION INFORMATION for Safe Operating parameters

ELECTRICAL CHARACTERISTICS (T_J = 25 °C unless otherwise noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
OUTER IGBT (T1, T4)						
I _{CES}	Collector-Emitter Cutoff Current	V _{GE} = 0 V, V _{CE} = 1050 V	–	–	500	μA
V _{CE(sat)}	Collector-Emitter Saturation Voltage	V _{GE} = 15 V, I _C = 600 A, T _J = 25 °C	–	1.6	2.3	V
		V _{GE} = 15 V, I _C = 600 A, T _J = 150 °C	–	2.0	–	
V _{GE(TH)}	Gate-Emitter Threshold Voltage	V _{GE} = V _{CE} , I _C = 600 mA	4.0	5.5	6.9	V
I _{GES}	Gate Leakage Current	V _{GE} = 20 V, V _{CE} = 0 V	–	–	1	μA
R _g	Internal Gate Resistor		–	0.58	–	Ω
	Turn-off safe operating area	V _{CC} < 800 V, R _{G (off)} ≥ 30 Ω, T _{vj} < 150 °C	–	800	–	A
t _{d(on)}	Turn-on Delay Time	T _J = 25 °C V _{CE} = 600 V, I _C = 200 A V _{GE} = -9 V to +15 V, R _{G (on)} = 9 Ω, R _{G (off)} = 18 Ω	–	260	–	ns
t _r	Rise Time		–	60	–	
t _{d(off)}	Turn-off Delay Time		–	1264	–	
t _f	Fall Time		–	15	–	
E _{on}	Turn-on Switching Loss per Pulse	T _J = 125 °C V _{CE} = 600 V, I _C = 200 A V _{GE} = -9 V to +15 V, R _{G (on)} = 9 Ω, R _{G (off)} = 18 Ω	–	6570	–	μJ
E _{off}	Turn-off Switching Loss per Pulse		–	9400	–	
t _{d(on)}	Turn-on Delay Time		–	230	–	ns
t _r	Rise Time		–	63	–	
t _{d(off)}	Turn-off Delay Time		–	1369	–	
t _f	Fall Time		–	9.8	–	
E _{on}	Turn-on Switching Loss per Pulse	V _{CE} = 20 V, V _{GE} = 0 V, f = 100 kHz	–	7130	–	μJ
E _{off}	Turn-off Switching Loss per Pulse		–	11860	–	
C _{ies}	Input Capacitance		–	48843	–	pF
C _{oes}	Output Capacitance		–	1767	–	
C _{res}	Reverse Transfer Capacitance		–	281	–	
Q _g	Total Gate Charge	V _{CE} = 600 V, I _C = 57 A, V _{GE} = -15/+20 V	–	2988	–	nC
R _{thJH}	Thermal Resistance – Chip-to-heatsink	Thermal grease, Thickness = 2 Mil ±2%, λ = 2.87 W/mK	–	0.139	–	°C/W
R _{thJC}	Thermal Resistance – Chip-to-case		–	0.088	–	°C/W

SIC NEUTRAL POINT DIODE (D5, D6)

V _F	Diode Forward Voltage	I _F = 200 A, T _J = 25 °C	–	1.6	1.75	V
		I _F = 200 A, T _J = 150 °C	–	2.1	–	
t _{rr}	Reverse Recovery Time	T _J = 25 °C V _{CE} = 600 V, I _C = 200 A V _{GE} = -9 V to +15 V, R _{G (on)} = 9 Ω	–	20	–	ns
Q _{rr}	Reverse Recovery Charge		–	400	–	nC
I _{RRM}	Peak Reverse Recovery Current		–	24	–	A
di/dt	Peak Rate of Fall of Recovery Current		–	2.5	–	A/ns
E _{rr}	Reverse Recovery Energy		–	117	–	μJ

NXH600N105H7F5S2HG, NXH600N105H7F5P2HG

ELECTRICAL CHARACTERISTICS (T_J = 25 °C unless otherwise noted) (continued)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
SIC NEUTRAL POINT DIODE (D5, D6)						
t _{rr}	Reverse Recovery Time	T _J = 125 °C V _{CE} = 600 V, I _C = 200 A V _{GE} = -9 V to +15 V, R _{G (off)} = 9 Ω	–	23	–	ns
Q _{rr}	Reverse Recovery Charge		–	500	–	nC
I _{RRM}	Peak Reverse Recovery Current		–	29	–	A
di/dt	Peak Rate of Fall of Recovery Current		–	2.4	–	A/ns
E _{rr}	Reverse Recovery Energy		–	150	–	μJ
R _{thJH}	Thermal Resistance – Chip-to-heatsink	Thermal grease, Thickness = 2 Mil ±2%, λ = 2.87 W/mK	–	0.297	–	K/W
R _{thJC}	Thermal Resistance – Chip-to-case		–	0.227	–	°C/W

INNER IGBT (T2, T3)

I _{CES}	Collector-Emitter Cutoff Current	V _{GE} = 0 V, V _{CE} = 1050 V	–	–2	500	μA
V _{CE(sat)}	Collector-Emitter Saturation Voltage	V _{GE} = 15 V, I _C = 600 A, T _J = 25 °C	–	1.6	2.3	V
		V _{GE} = 15 V, I _C = 600 A, T _J = 150 °C	–	2.0	–	
V _{GE(TH)}	Gate-Emitter Threshold Voltage	V _{GE} = V _{CE} , I _C = 600 mA	4.0	5.5	6.9	V
I _{GES}	Gate Leakage Current	V _{GE} = 20 V, V _{CE} = 0 V	–	–0.02	1	μA
R _g	Internal Gate Resistor		–	0.58	–	Ω
	Turn-off Safe Operating Area	V _{CC} < 800V, R _{G (off)} ≥ 35 Ω, T _{vj} < 150 °C	–	800	–	A
t _{d(on)}	Turn-on Delay Time	T _J = 25 °C V _{CE} = 600 V, I _C = 200 A V _{GE} = -9 V to +15 V, R _{G (on)} = 7 Ω, R _{G (off)} = 31 Ω	–	233	–	ns
t _r	Rise Time		–	57	–	
t _{d(off)}	Turn-off Delay Time		–	2200	–	
t _f	Fall Time		–	18	–	
E _{on}	Turn-on Switching Loss per Pulse		–	8640	–	μJ
E _{off}	Turn-off Switching Loss per Pulse		–	11800	–	
t _{d(on)}	Turn-on Delay Time	T _J = 125 °C V _{CE} = 600 V, I _C = 200 A V _{GE} = -9 V to +15 V, R _{G (on)} = 7 Ω, R _{G (off)} = 31 Ω	–	210	–	ns
t _r	Rise Time		–	62	–	
t _{d(off)}	Turn-off Delay Time		–	2350	–	
t _f	Fall Time		–	18	–	
E _{on}	Turn-on Switching Loss per Pulse		–	12510	–	μJ
E _{off}	Turn-off Switching Loss per Pulse		–	14500	–	
C _{ies}	Input Capacitance	V _{CE} = 20 V, V _{GE} = 0 V, f = 100 kHz	–	47927	–	pF
C _{oes}	Output Capacitance		–	1871	–	
C _{res}	Reverse Transfer Capacitance		–	304	–	
Q _g	Total Gate Charge	V _{CE} = 600 V, I _C = 57 A, V _{GE} = -15/+20 V	–	2940	–	nC
R _{thJH}	Thermal Resistance – Chip-to-heatsink	Thermal grease, Thickness = 2 Mil ±2%, λ = 2.87 W/mK	–	0.139	–	°C/W
R _{thJC}	Thermal Resistance – Chip-to-case		–	0.088	–	°C/W

INVERSE DIODES (D1, D2, D3, D4)

V _F	Diode Forward Voltage	I _F = 300 A, T _J = 25 °C	–	2.5	3.4	V
		I _F = 300 A, T _J = 150 °C	–	2.3	–	

NXH600N105H7F5S2HG, NXH600N105H7F5P2HG

ELECTRICAL CHARACTERISTICS (T_J = 25 °C unless otherwise noted) (continued)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
INVERSE DIODES (D1, D2, D3, D4)						
t _{rr}	Reverse Recovery Time	T _J = 25 °C V _{CE} = 600 V, I _C = 200 A V _{GE} = -9 V to +15 V, R _{G (on)} = 7 Ω	–	100	–	ns
Q _{rr}	Reverse Recovery Charge		–	5580	–	nC
I _{RRM}	Peak Reverse Recovery Current		–	135	–	A
di/dt	Peak Rate of Fall of Recovery Current		–	2.8	–	A/ns
E _{rr}	Reverse Recovery Energy		–	1664	–	μJ
t _{rr}	Reverse Recovery Time	T _J = 125 °C V _{CE} = 600 V, I _C = 200 A V _{GE} = -9 V to +15 V, R _{G (on)} = 7 Ω	–	187	–	ns
Q _{rr}	Reverse Recovery Charge		–	16903	–	nC
I _{RRM}	Peak Reverse Recovery Current		–	201	–	A
di/dt	Peak Rate of Fall of Recovery Current		–	2.6	–	A/ns
E _{rr}	Reverse Recovery Energy		–	6485	–	μJ
R _{thJH}	Thermal Resistance – Chip-to-heatsink	Thermal grease, Thickness = 2 Mil ±2%, λ = 2.87 W/mK	–	0.277	–	°C/W
R _{thJC}	Thermal Resistance – Chip-to-case		–	0.220	–	°C/W

THERMISTOR CHARACTERISTICS

R ₂₅	Nominal Resistance	T = 25 °C	–	5	–	kΩ
R ₁₀₀	Nominal Resistance	T = 100 °C	–	492.2	–	Ω
R/R	Deviation of R25		-1	–	1	%
P _D	Power Dissipation		–	5	–	mW
	Power Dissipation Constant		–	1.3	–	mW/K
	B-value	B(25/85), tolerance ±1%	–	3430	–	K

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

ORDERING INFORMATION

Orderable Part Number	Marking	Package	Shipping
NXH600N105H7F5S2HG	NXH600N105H7F5S2HG	F5 – PIM60 112x62 (SOLDER PIN) (Pb-Free / Halide Free)	8 Units / Blister Tray
NXH600N105H7F5P2HG	NXH600N105H7F5P2HG	F5 – PIM60 112x62 (PRESS FIT PIN) (Pb-Free / Halide Free)	8 Units / Blister Tray

NXH600N105H7F5S2HG, NXH600N105H7F5P2HG

TYPICAL CHARACTERISTICS – IGBT T1/T4 AND D5/D6 DIODE

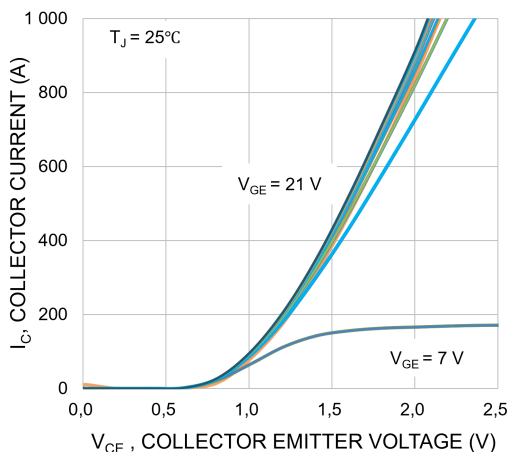


Figure 2. Typical Output Characteristics – IGBT

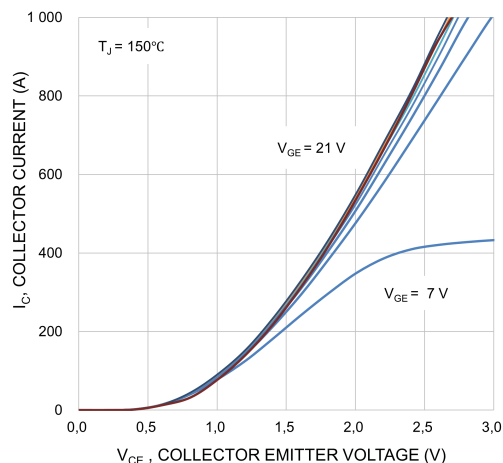


Figure 3. Typical Output Characteristics – IGBT

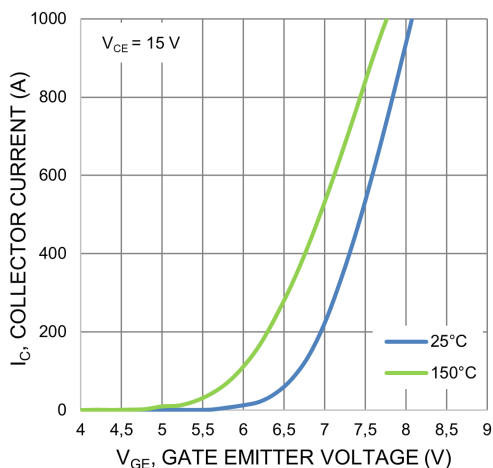


Figure 4. Transfer Characteristics – IGBT

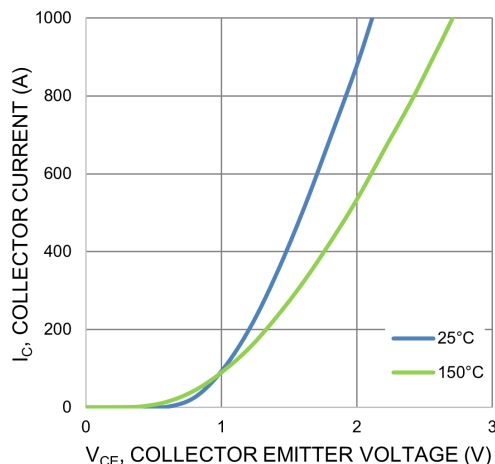


Figure 5. Saturation Voltage Characteristic – IGBT

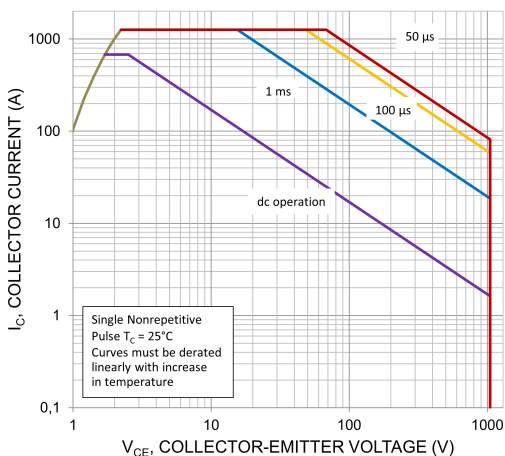


Figure 6. FBSOA

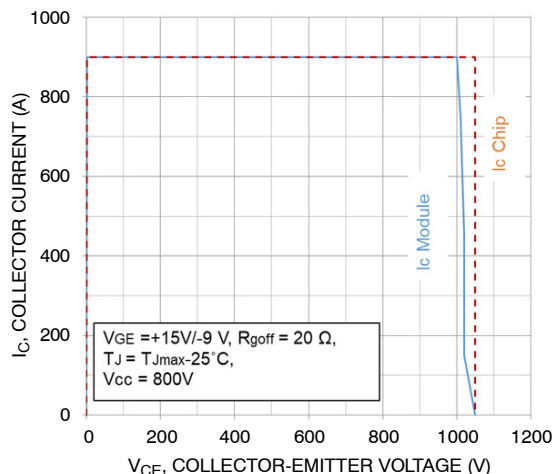


Figure 7. RBSOA (T1/T4)

NXH600N105H7F5S2HG, NXH600N105H7F5P2HG

TYPICAL CHARACTERISTICS – IGBT T1/T4 AND D5/D6 DIODE (CONTINUED)

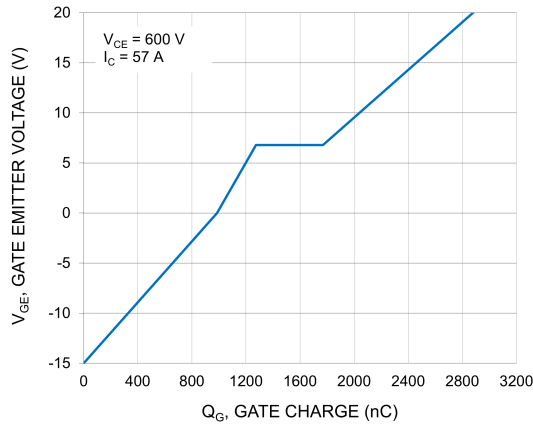


Figure 8. Gate Voltage vs. Gate Charge

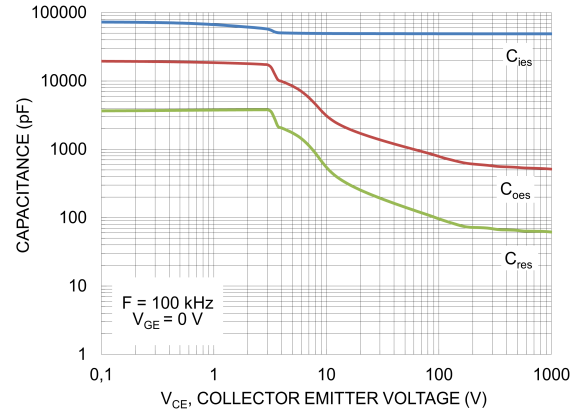


Figure 9. Capacitance

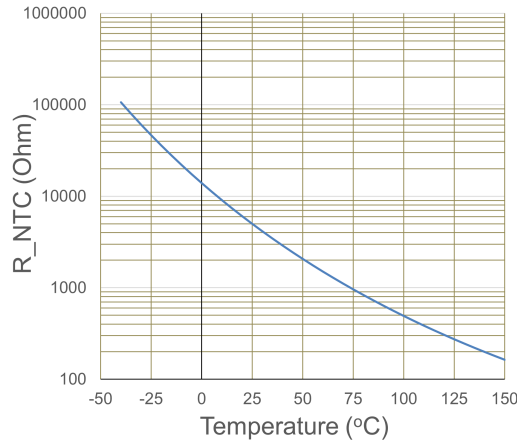


Figure 10. Temperature vs. NTC Value

TYPICAL CHARACTERISTICS – IGBT T2/T3 AND D3/D4, D1/D2 DIODE

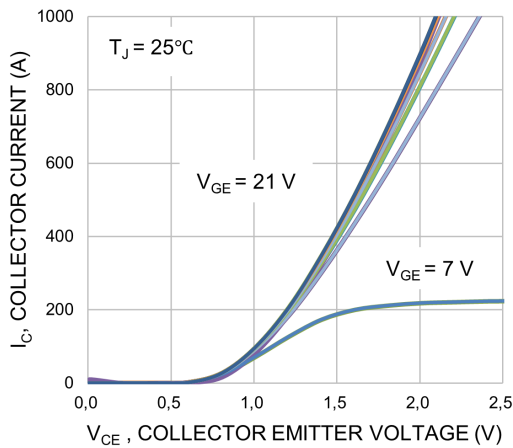


Figure 11. Typical Output Characteristics

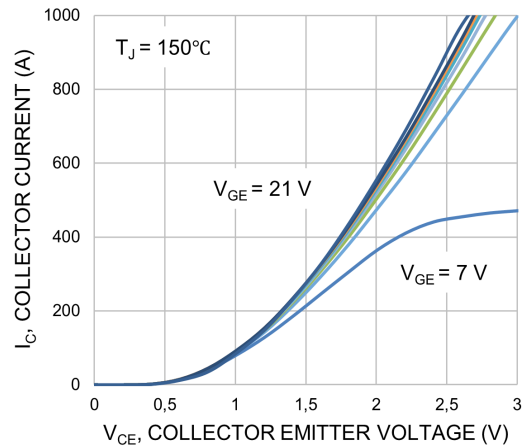


Figure 12. Typical Output Characteristics

TYPICAL CHARACTERISTICS – IGBT T2/T3 AND D3/D4, D1/D2 DIODE (CONTINUED)

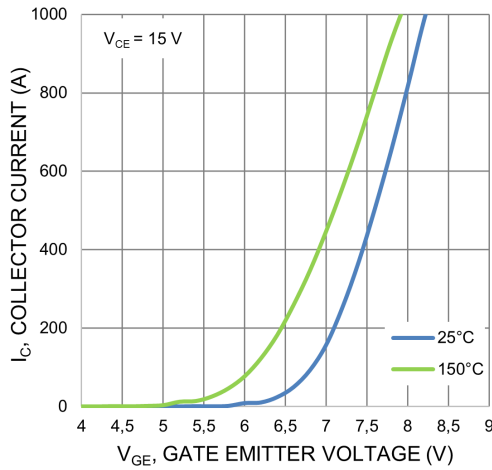


Figure 13. Transfer Characteristics – IGBT

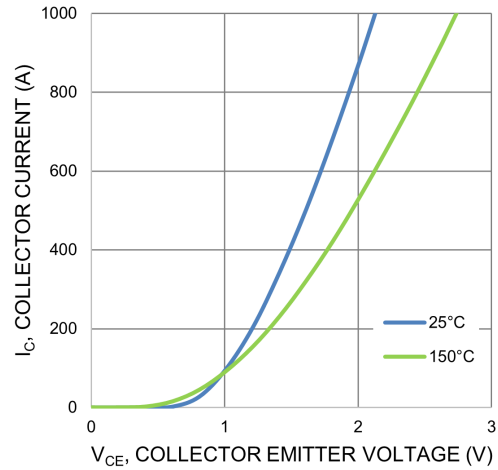


Figure 14. Saturation Voltage Characteristic – IGBT

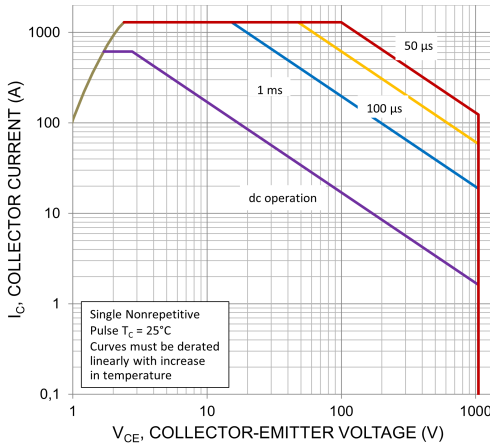


Figure 15. FBSOA

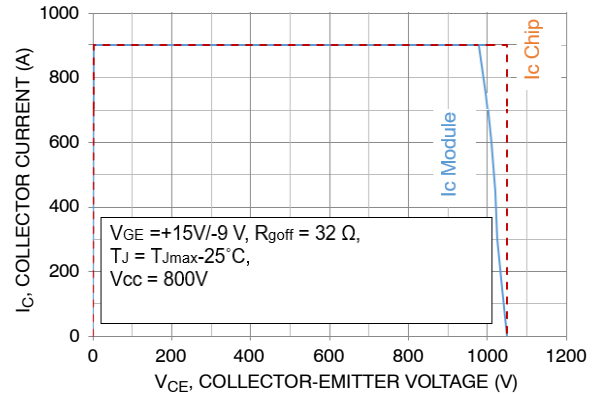


Figure 16. RBSOA (T2/T3)

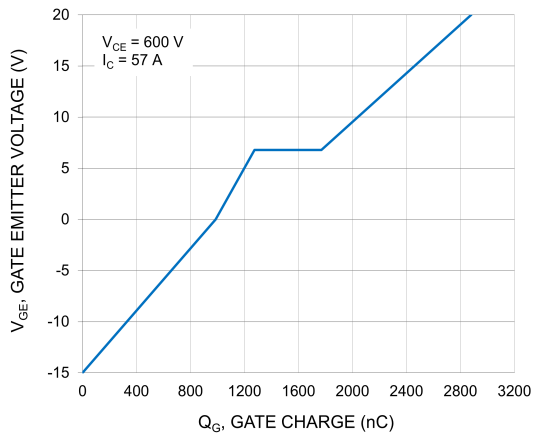


Figure 17. Gate Voltage vs. Gate Charge

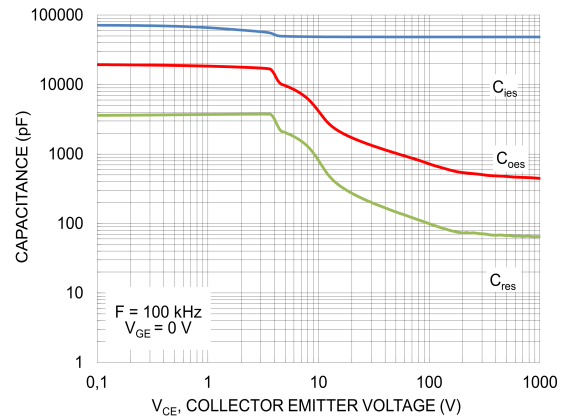


Figure 18. Capacitance vs. V_{CE}

NXH600N105H7F5S2HG, NXH600N105H7F5P2HG

TYPICAL CHARACTERISTICS – IGBT T2/T3 AND D3/D4, D1/D2 DIODE (CONTINUED)

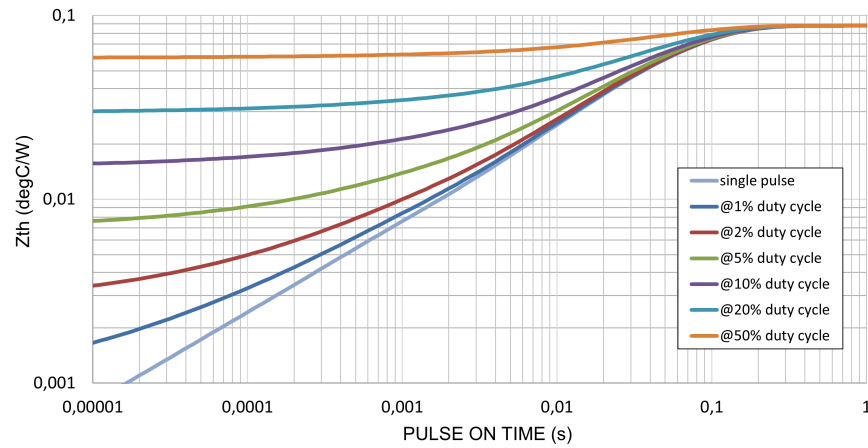


Figure 19. Transient Thermal Impedance (IGBT)

TYPICAL CHARACTERISTIC – D2, D3 (SIC INVERSE DIODE)

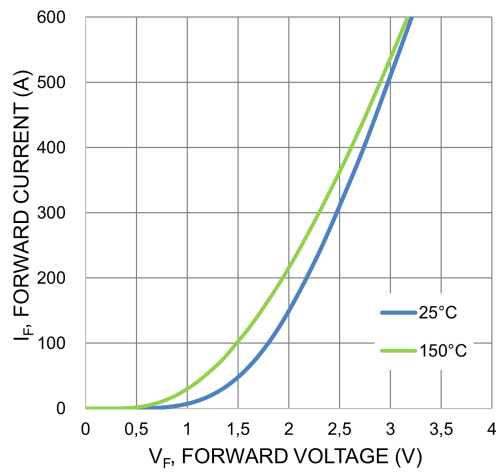


Figure 20. Inverse Diode Forward Characteristics

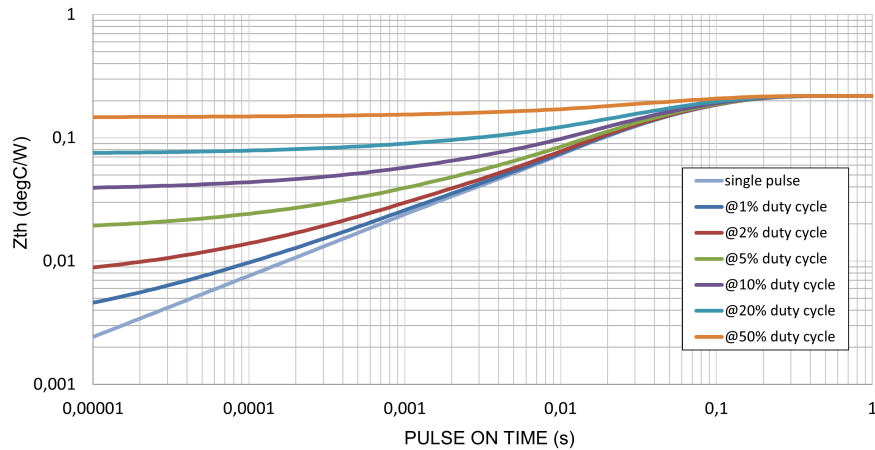


Figure 21. Transient Thermal Impedance (Inverse Diode)

NXH600N105H7F5S2HG, NXH600N105H7F5P2HG

TYPICAL CHARACTERISTIC – D5/D6 (NEUTRAL POINT DIODE)

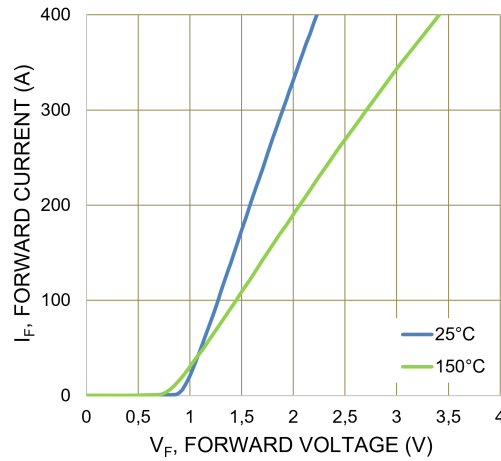


Figure 22. Neutral Diode Forward Characteristics

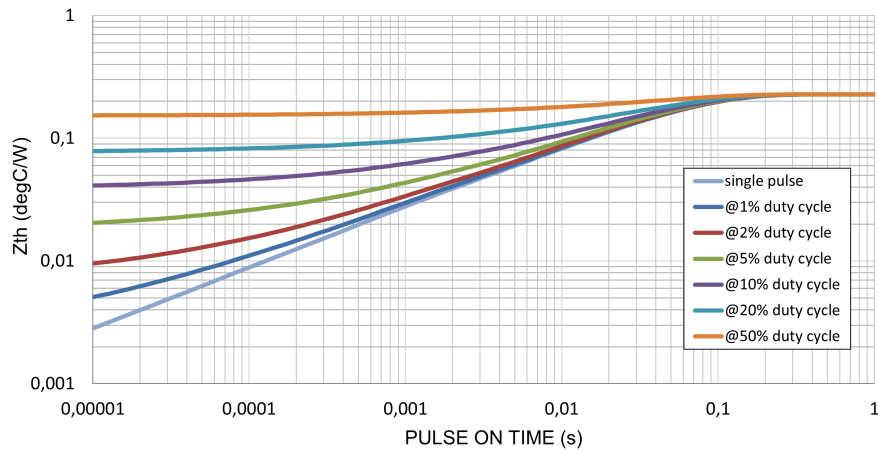


Figure 23. Transient Thermal Impedance (Neutral Point Diode)

TYPICAL CHARACTERISTIC – T1||D5 OR T4||D6

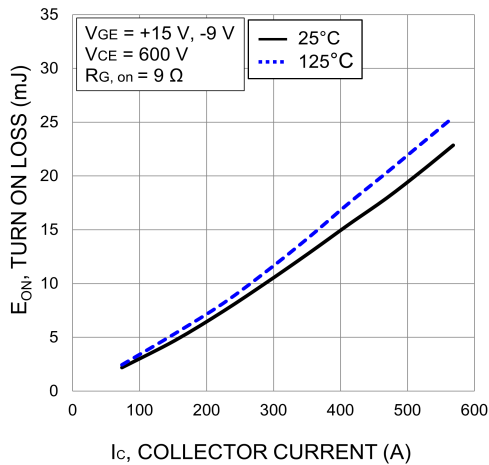


Figure 24. Typical Turn On Loss vs. I_C

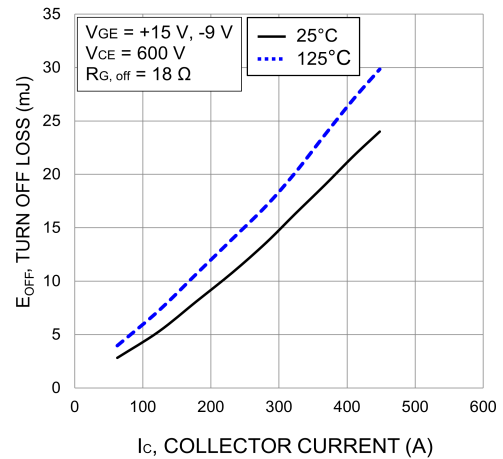


Figure 25. Typical Turn Off Loss vs. I_C

NXH600N105H7F5S2HG, NXH600N105H7F5P2HG

TYPICAL CHARACTERISTIC – T1||D5 OR T4||D6 (CONTINUED)

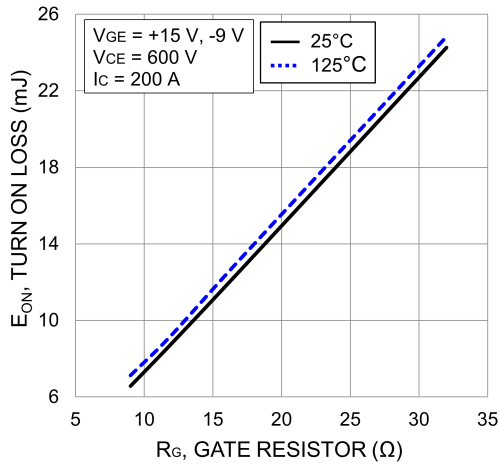


Figure 26. Typical Turn On Loss vs. R_G

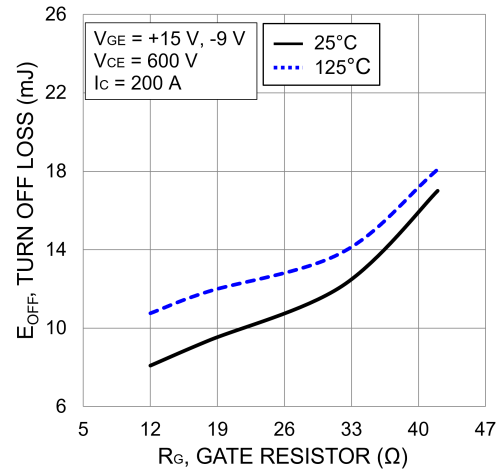


Figure 27. Typical Turn Off Loss vs. R_G

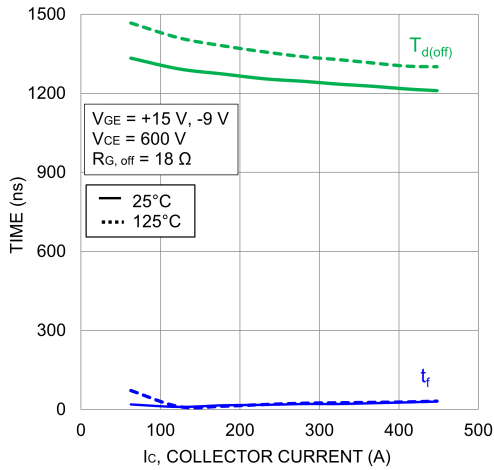


Figure 28. Typical Turn-Off Switching Time vs. I_C

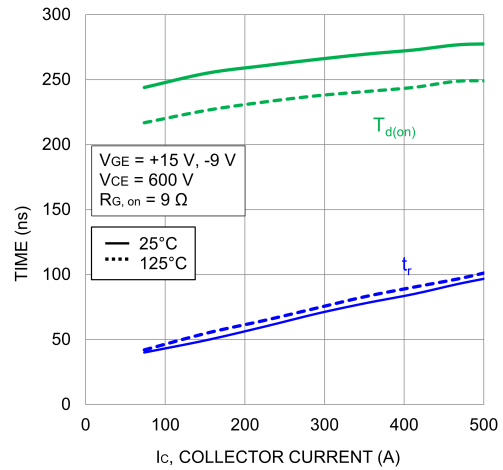


Figure 29. Typical Turn-On Switching Time vs. I_C

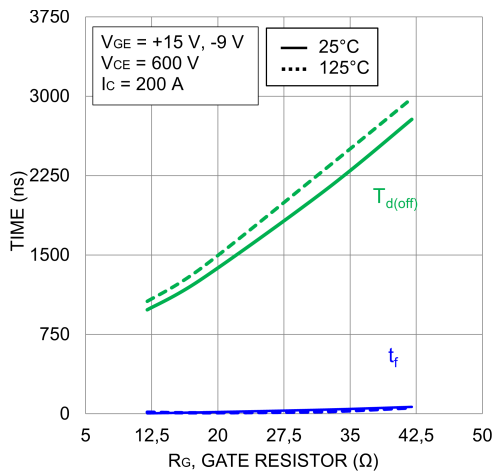


Figure 30. Typical Turn-Off Switching Time vs. R_G

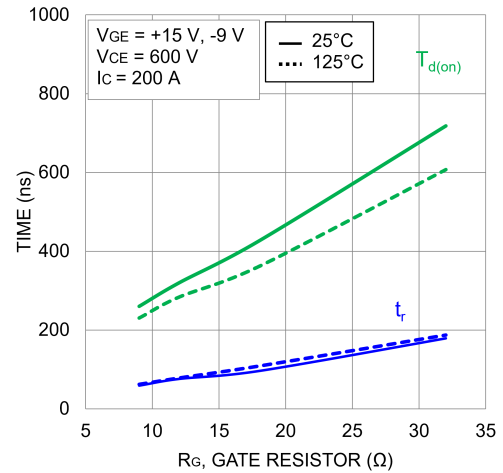


Figure 31. Typical Turn-On Switching Time vs. R_G

TYPICAL CHARACTERISTIC – D5/D6 (NEUTRAL POINT DIODE)

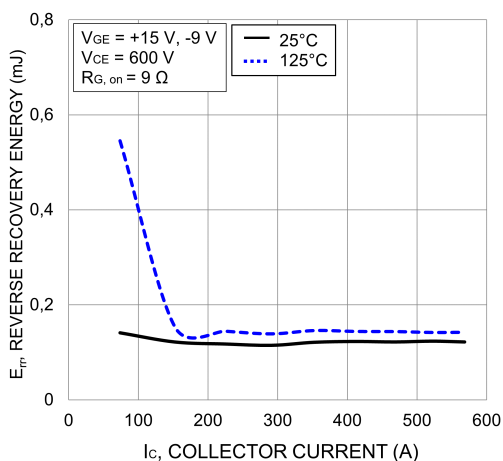


Figure 32. Typical Reverse Recovery Energy Loss vs. I_C

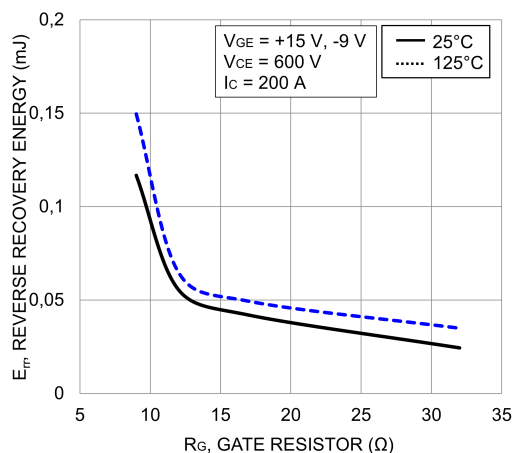


Figure 33. Typical Reverse Recovery Energy Loss vs. R_G

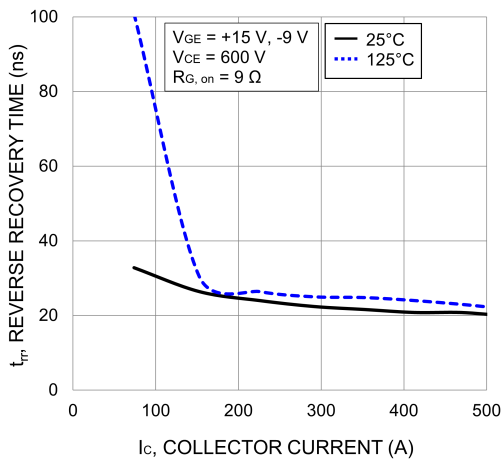


Figure 34. Typical Reverse Recovery Time vs. I_C

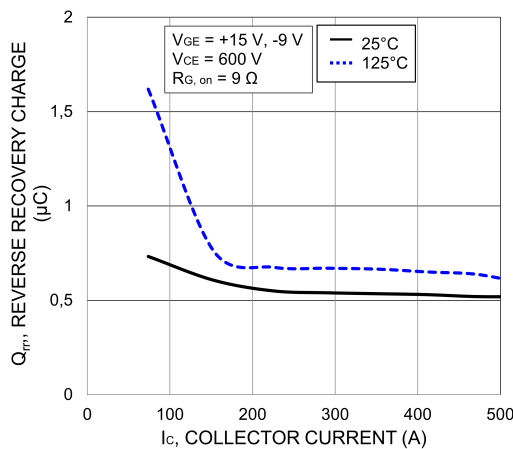


Figure 35. Typical Reverse Recovery Charge vs. I_C

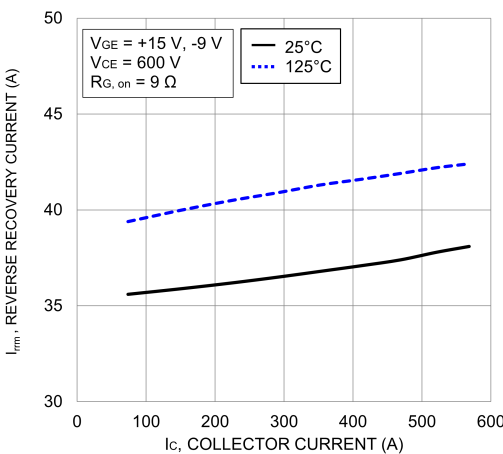


Figure 36. Typical Reverse Recovery Current vs. I_C

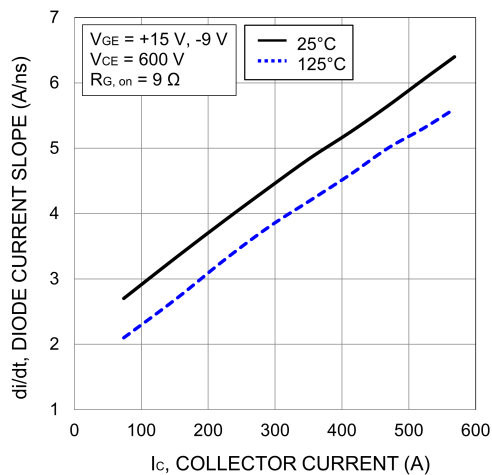


Figure 37. Typical Diode Current Slope vs. I_C

NXH600N105H7F5S2HG, NXH600N105H7F5P2HG

TYPICAL CHARACTERISTIC – D5/D6 (NEUTRAL POINT DIODE) (CONTINUED)

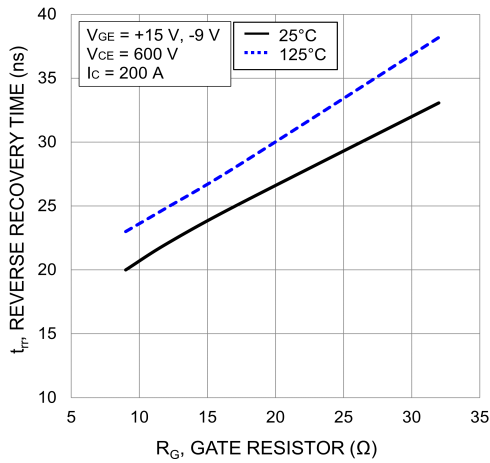


Figure 38. Typical Reverse Recovery Time vs. R_G

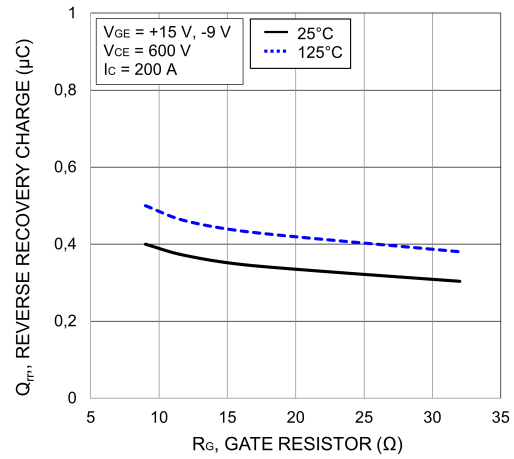


Figure 39. Typical Reverse Recovery Charge vs. R_G

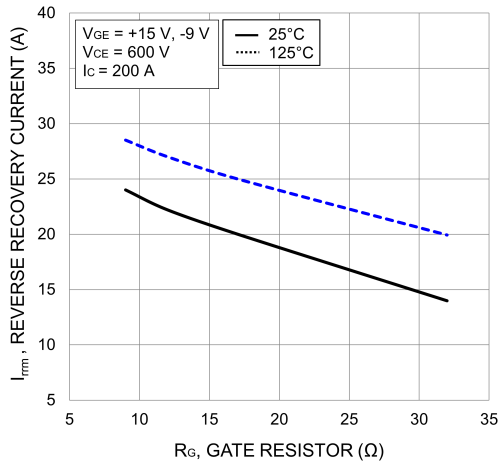


Figure 40. Typical Reverse Recovery Current vs. R_G

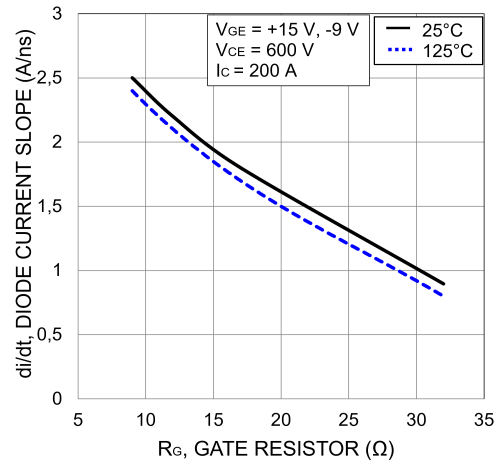


Figure 41. Typical Diode Current Slope vs. R_G

TYPICAL CHARACTERISTIC – T2||D3 + D4 OR T3||D1 + D2

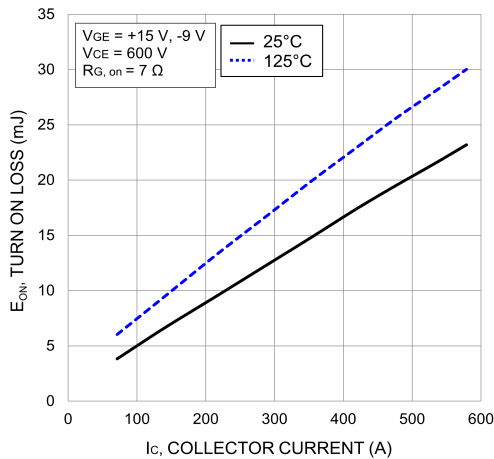


Figure 42. Typical Turn On Loss vs. I_C

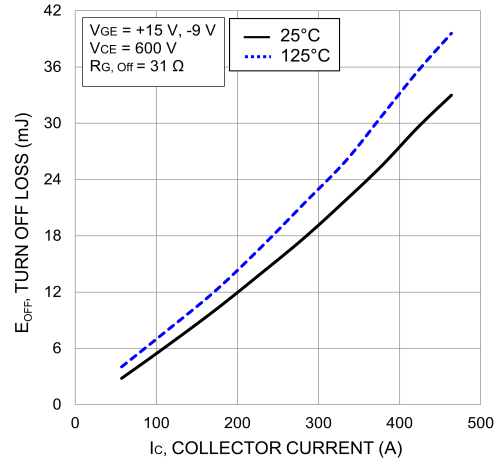


Figure 43. Typical Turn Off Loss vs. I_C

NXH600N105H7F5S2HG, NXH600N105H7F5P2HG

TYPICAL CHARACTERISTIC – T2||D3 + D4 OR T3||D1 + D2 (CONTINUED)

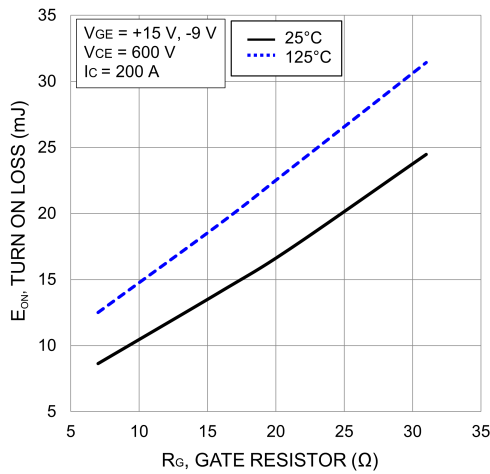


Figure 44. Typical Turn On Loss vs. R_G

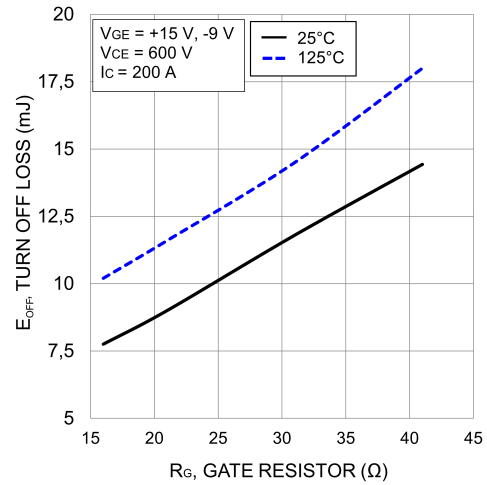


Figure 45. Typical Turn Off Loss vs. R_G

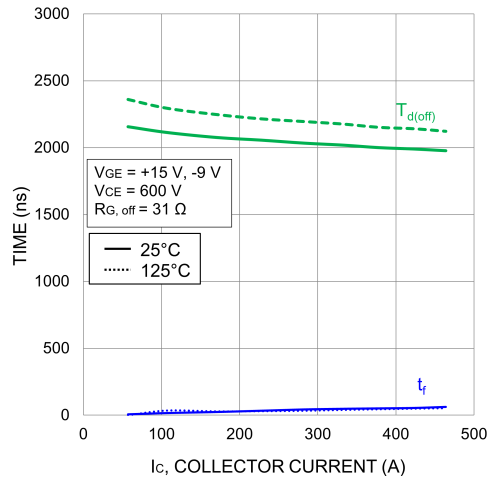


Figure 46. Typical Turn-Off Switching Time vs. I_C

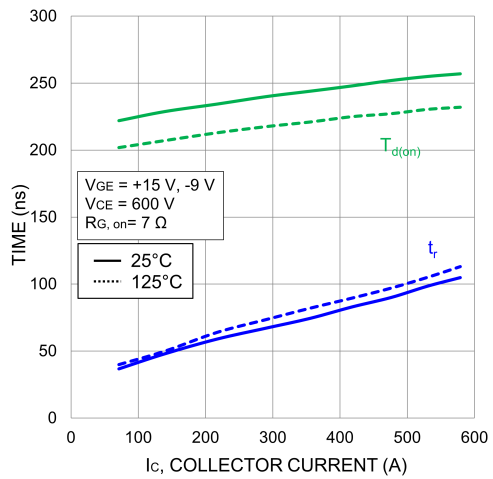


Figure 47. Typical Turn-On Switching Time vs. I_C

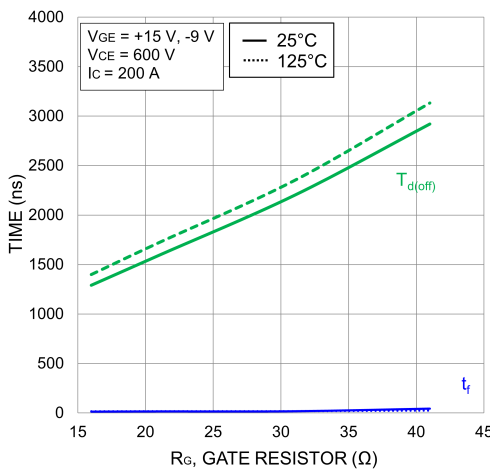


Figure 48. Typical Turn-Off Switching Time vs. R_G

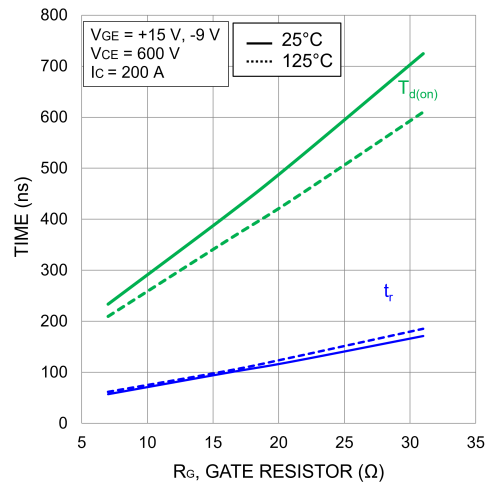


Figure 49. Typical Turn-On Switching Time vs. R_G

TYPICAL CHARACTERISTIC – T2||D3 + D4 OR T3||D1 + D2 (CONTINUED)

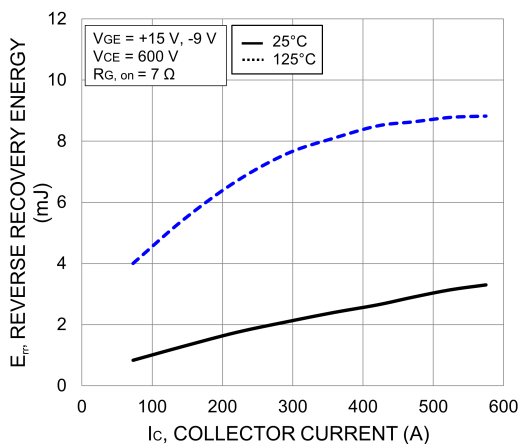


Figure 50. Typical Reverse Recovery Energy Loss vs. I_C

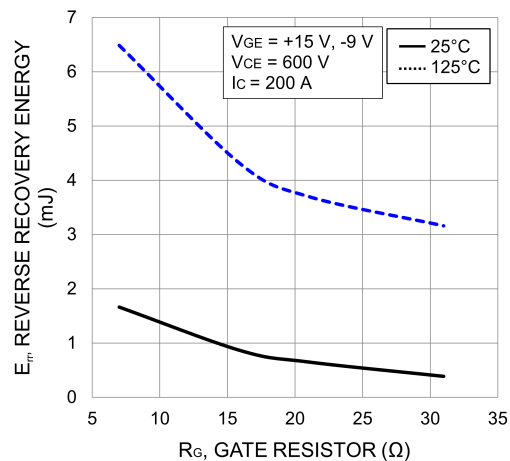


Figure 51. Typical Reverse Recovery Energy Loss vs. R_G

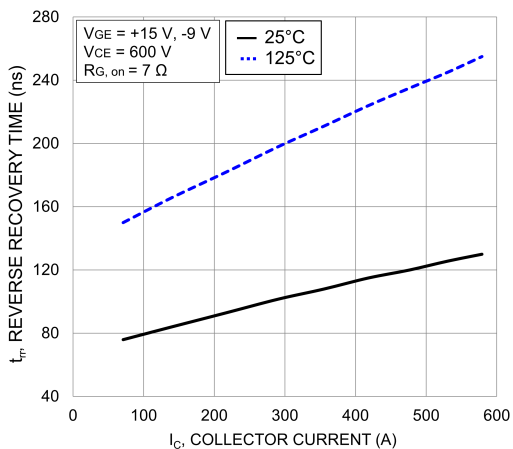


Figure 52. Typical Reverse Recovery Time vs. I_C

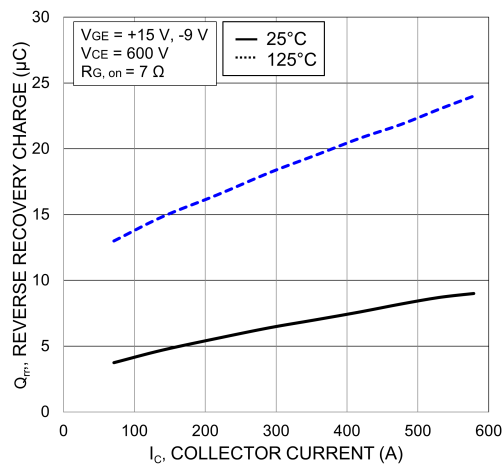


Figure 53. Typical Reverse Recovery Charge vs. I_C

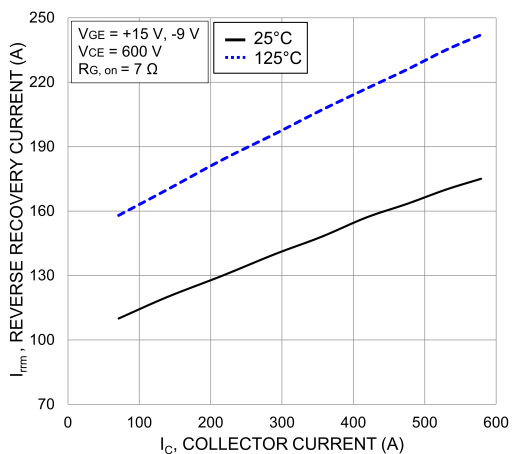


Figure 54. Typical Reverse Recovery Current vs. I_C

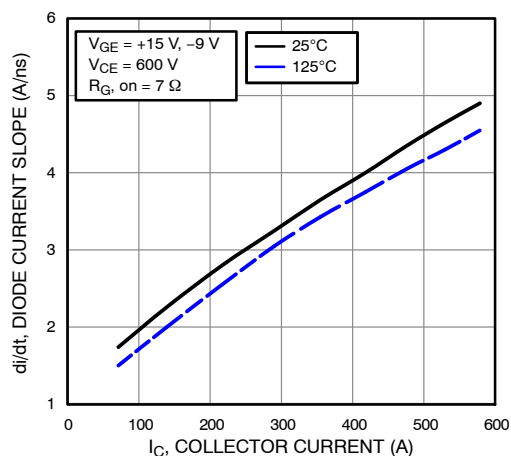


Figure 55. Typical di/dt vs. I_C

NXH600N105H7F5S2HG, NXH600N105H7F5P2HG

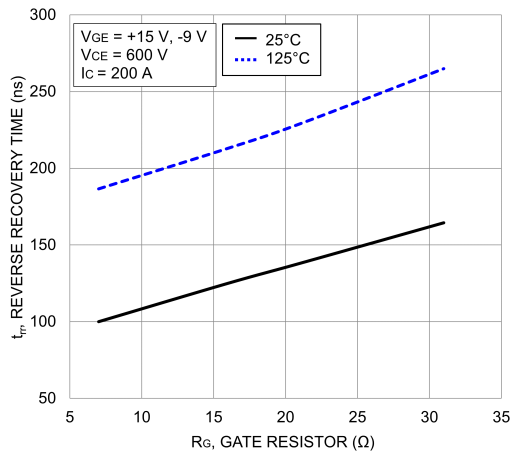


Figure 56. Typical Reverse Recovery Time vs. R_G

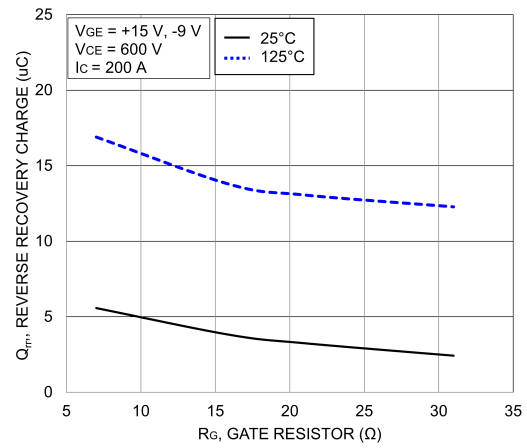


Figure 57. Typical Reverse Recovery Charge vs. R_G

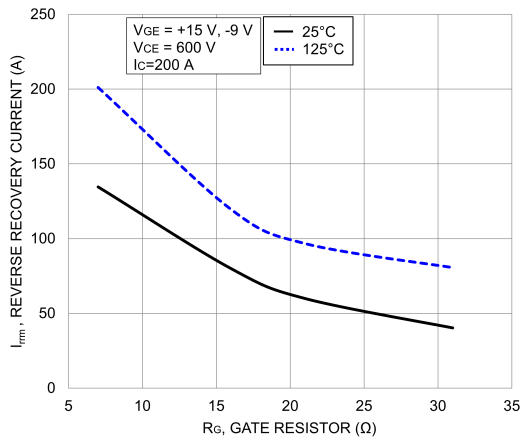


Figure 58. Typical Reverse Recovery Peak Current vs. R_G

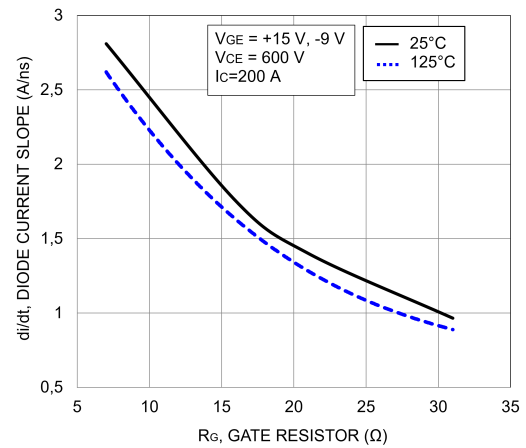


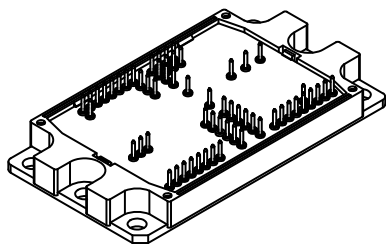
Figure 59. Typical di/dt vs. R_G

NXH600N105H7F5S2HG, NXH600N105H7F5P2HG

REVISION HISTORY

Revision	Description of Changes	Date
P3	Figure 7. RBSOA (T1/T4) and Figure 16. RBSOA (T2/T3) updated.	6/20/2025
P4	Updated TYP value of RthJH parameter in the Electrical Characteristics Table (SiC NEUTRAL POINT DIODE section) on page 4.	7/1/2025

This document has undergone updates prior to the inclusion of this revision history table. The changes tracked here only reflect updates made on the noted approval dates.

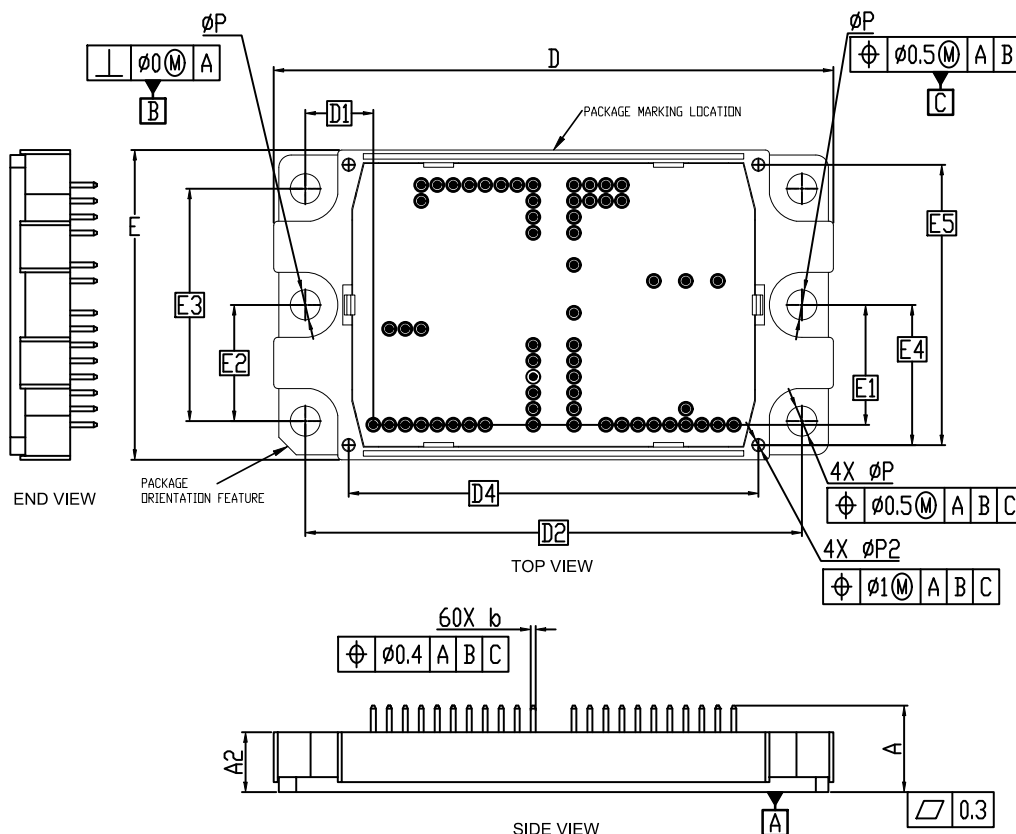


PIM60 112.00x62.00x12.00
CASE 180CW
ISSUE O

DATE 30 JUL 2024

NOTES:

1. Dimensioning and tolerancing conform to ASME Y14.5
2. All dimensions are in millimeters.
3. Pin-grid is 3.2mm.
4. Package marking is located on the side opposite the package orientation feature.
5. The pins are gold-plated solder pin.



DIM	MILLIMETERS		
	MIN.	NOM.	MAX.
A	17.00	17.40	17.80
A2	11.70	12.00	12.30
b	0.95	1.00	1.05
D	111.60	112.00	112.40
D1	13.62 BSC		
D2	99.40 BSC		
D4	82.00 BSC		
E	61.60	62.00	62.40
E1	24.00 BSC		
E2	23.25 BSC		
E3	46.50 BSC		
E4	28.05 BSC		
E5	56.10 BSC		
P	5.90	6.00	6.10
P2	2.20	2.30	2.40

DOCUMENT NUMBER: 98AON63827H

Electronic versions are uncontrolled except when accessed directly from the Document Repository.
Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.

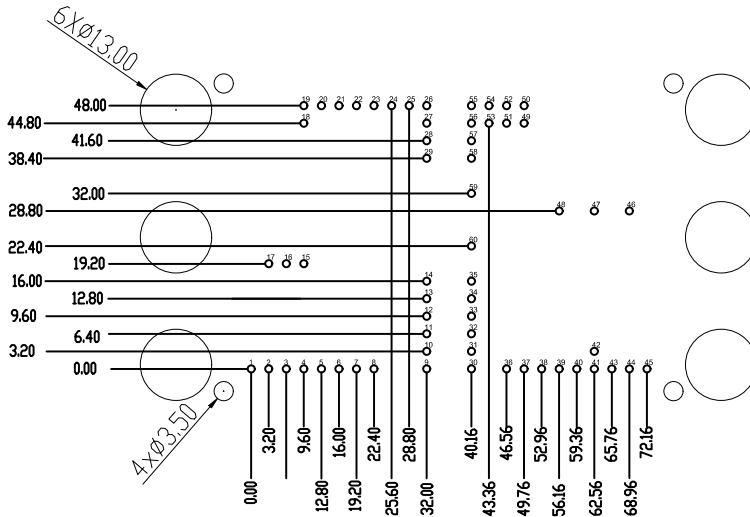
DESCRIPTION: PIM60 112.00x62.00x12.00

PAGE 1 OF 2

onsemi and onsemi are trademarks of Semiconductor Components Industries, LLC dba onsemi or its subsidiaries in the United States and/or other countries. onsemi reserves the right to make changes without further notice to any products herein. onsemi makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does onsemi assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. onsemi does not convey any license under its patent rights nor the rights of others.

PIM60 112.00x62.00x12.00
CASE 180CW
ISSUE O

DATE 30 JUL 2024



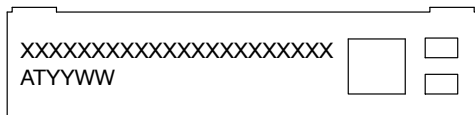
RECOMMENDED
MOUNTING PATTERN

* For additional information on our Pb-Free strategy and soldering details, please download the Onsemi Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

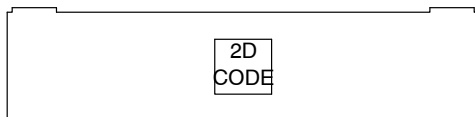
NOTE 2:

Pin POSITION								
Pin	X	Y	Pin	X	Y	Pin	X	Y
1	0.00	0.00	24	25.60	48.00	47	62.56	28.80
2	3.20	0.00	25	28.80	48.00	48	56.16	28.80
3	6.40	0.00	26	32.00	48.00	49	49.76	44.80
4	9.60	0.00	27	32.00	44.80	50	49.76	48.00
5	12.80	0.00	28	32.00	41.60	51	46.56	44.80
6	16.00	0.00	29	32.00	38.40	52	46.56	48.00
7	19.20	0.00	30	40.16	0.00	53	43.36	44.80
8	22.40	0.00	31	40.16	3.20	54	43.36	48.00
9	32.00	0.00	32	40.16	6.40	55	40.16	48.00
10	32.00	3.20	33	40.16	9.60	56	40.16	44.80
11	32.00	6.40	34	40.16	12.80	57	40.16	41.60
12	32.00	9.60	35	40.16	16.00	58	40.16	38.40
13	32.00	12.80	36	46.56	0.00	59	40.16	32.00
14	32.00	16.00	37	49.76	0.00	60	40.16	22.40
15	9.60	19.20	38	52.96	0.00			
16	6.40	19.20	39	56.16	0.00			
17	3.20	19.20	40	59.36	0.00			
18	9.60	44.80	41	62.56	0.00			
19	9.60	48.00	42	62.56	3.20			
20	12.80	48.00	43	65.76	0.00			
21	16.00	48.00	44	68.96	0.00			
22	19.20	48.00	45	72.16	0.00			
23	22.40	48.00	46	68.96	28.80			

GENERIC
MARKING DIAGRAM*



FRONTSIDE MARKING



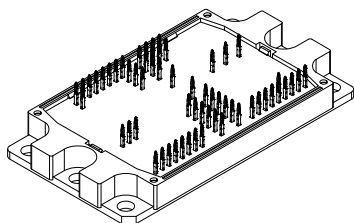
BACKSIDE MARKING

XXXXX = Specific Device Code
AT = Assembly & Test Site Code
YYWW = Year and Work Week Code

*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "▪", may or may not be present. Some products may not follow the Generic Marking.

DOCUMENT NUMBER:	98AON63827H	Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.
DESCRIPTION:	PIM60 112.00x62.00x12.00	PAGE 2 OF 2

onsemi and Onsemi are trademarks of Semiconductor Components Industries, LLC dba onsemi or its subsidiaries in the United States and/or other countries. onsemi reserves the right to make changes without further notice to any products herein. onsemi makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does onsemi assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. onsemi does not convey any license under its patent rights nor the rights of others.

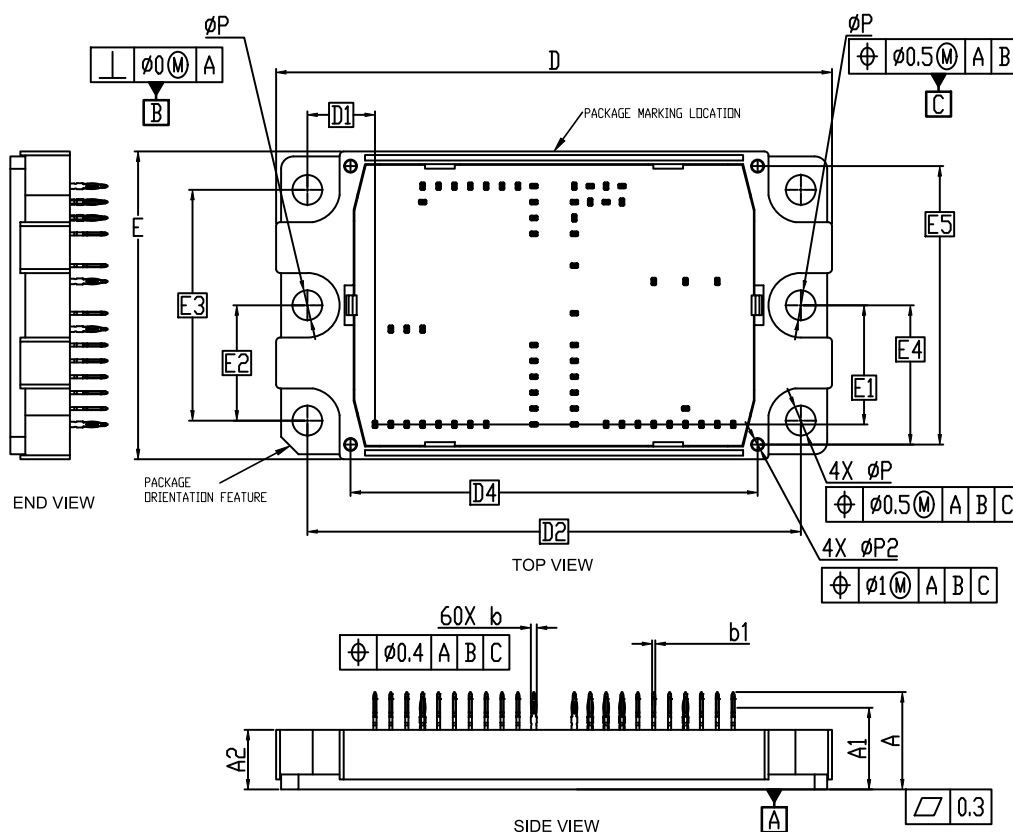


PIM60 112.00x62.00x12.00
CASE 180HY
ISSUE O

DATE 30 JUL 2024

NOTES:

1. Dimensioning and tolerancing conform to ASME Y14.5
2. All dimensions are in millimeters.
3. Dimensions b and b1 apply to the plated terminals and are measured at dimension A1
4. Pin-grid is 3.2mm.
5. Package marking is located on the side opposite the package orientation feature.
6. The pins are Sn plated press fit pin.



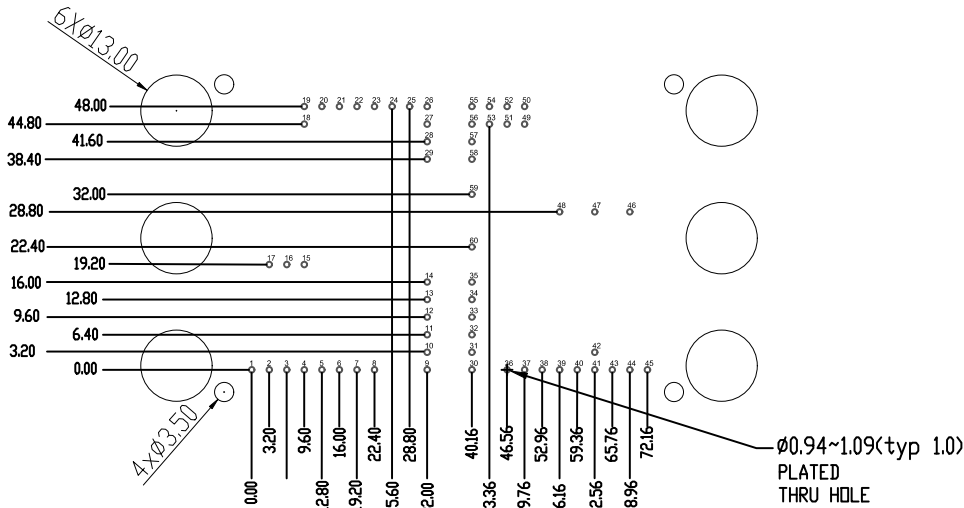
DIM	MILLIMETERS		
	MIN.	NOM.	MAX.
A	19.20	19.60	20.00
A1	16.25	16.45	16.65
A2	11.70	12.00	12.30
b	1.15	1.20	1.25
b1	0.59	0.64	0.69
D	111.60	112.00	112.40
D1	13.62 BSC		
D2	99.40 BSC		
D4	82.00 BSC		
E	61.60	62.00	62.40
E1	24.00 BSC		
E2	23.25 BSC		
E3	46.50 BSC		
E4	28.05 BSC		
E5	56.10 BSC		
P	5.90	6.00	6.10
P2	2.20	2.30	2.40

DOCUMENT NUMBER:	98AON63926H	Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.
DESCRIPTION:	PIM60 112.00x62.00x12.00	PAGE 1 OF 2

onsemi and **onsemi** are trademarks of Semiconductor Components Industries, LLC dba **onsemi** or its subsidiaries in the United States and/or other countries. **onsemi** reserves the right to make changes without further notice to any products herein. **onsemi** makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does **onsemi** assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. **onsemi** does not convey any license under its patent rights nor the rights of others.

PIM60 112.00x62.00x12.00
CASE 180HY
ISSUE O

DATE 30 JUL 2024



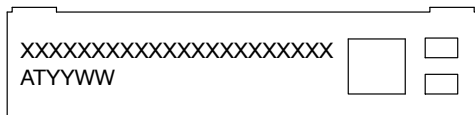
RECOMMENDED
MOUNTING PATTERN

* For additional Information on our Pb-Free strategy and soldering details, please download the Onsemi Soldering and Mounting Techniques Reference Manual, SOLDERM/D.

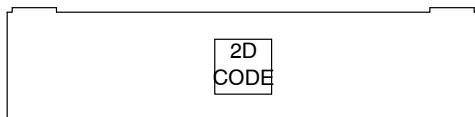
NOTE 2:

Pin POSITION								
Pin	X	Y	Pin	X	Y	Pin	X	Y
1	0.00	0.00	24	25.60	48.00	47	62.56	28.80
2	3.20	0.00	25	28.80	48.00	48	56.16	28.80
3	6.40	0.00	26	32.00	48.00	49	49.76	44.80
4	9.60	0.00	27	32.00	44.80	50	49.76	48.00
5	12.80	0.00	28	32.00	41.60	51	46.56	44.80
6	16.00	0.00	29	32.00	38.40	52	46.56	48.00
7	19.20	0.00	30	40.16	0.00	53	43.36	44.80
8	22.40	0.00	31	40.16	3.20	54	43.36	48.00
9	32.00	0.00	32	40.16	6.40	55	40.16	48.00
10	32.00	3.20	33	40.16	9.60	56	40.16	44.80
11	32.00	6.40	34	40.16	12.80	57	40.16	41.60
12	32.00	9.60	35	40.16	16.00	58	40.16	38.40
13	32.00	12.80	36	46.56	0.00	59	40.16	32.00
14	32.00	16.00	37	49.76	0.00	60	40.16	22.40
15	9.60	19.20	38	52.96	0.00			
16	6.40	19.20	39	56.16	0.00			
17	3.20	19.20	40	59.36	0.00			
18	9.60	44.80	41	62.56	0.00			
19	9.60	48.00	42	62.56	3.20			
20	12.80	48.00	43	65.76	0.00			
21	16.00	48.00	44	68.96	0.00			
22	19.20	48.00	45	72.16	0.00			
23	22.40	48.00	46	68.96	28.80			

GENERIC
MARKING DIAGRAM*



FRONTSIDE MARKING



BACKSIDE MARKING

XXXXX = Specific Device Code
AT = Assembly & Test Site Code
YYWW = Year and Work Week Code

*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "▪", may or may not be present. Some products may not follow the Generic Marking.

DOCUMENT NUMBER:	98AON63926H	Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.
DESCRIPTION:	PIM60 112.00x62.00x12.00	PAGE 2 OF 2

onsemi and onsemi are trademarks of Semiconductor Components Industries, LLC dba onsemi or its subsidiaries in the United States and/or other countries. onsemi reserves the right to make changes without further notice to any products herein. onsemi makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does onsemi assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. onsemi does not convey any license under its patent rights nor the rights of others.

onsemi, **Onsemi**, and other names, marks, and brands are registered and/or common law trademarks of Semiconductor Components Industries, LLC dba "**onsemi**" or its affiliates and/or subsidiaries in the United States and/or other countries. **onsemi** owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of **onsemi**'s product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. **onsemi** reserves the right to make changes at any time to any products or information herein, without notice. The information herein is provided "as-is" and **onsemi** makes no warranty, representation or guarantee regarding the accuracy of the information, product features, availability, functionality, or suitability of its products for any particular purpose, nor does **onsemi** assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using **onsemi** products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by **onsemi**. "Typical" parameters which may be provided in **onsemi** data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. **onsemi** does not convey any license under any of its intellectual property rights nor the rights of others. **onsemi** products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use **onsemi** products for any such unintended or unauthorized application, Buyer shall indemnify and hold **onsemi** and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that **onsemi** was negligent regarding the design or manufacture of the part. **onsemi** is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

ADDITIONAL INFORMATION

TECHNICAL PUBLICATIONS:

Technical Library: www.onsemi.com/design/resources/technical-documentation
onsemi Website: www.onsemi.com

ONLINE SUPPORT: www.onsemi.com/support

For additional information, please contact your local Sales Representative at
www.onsemi.com/support/sales