

3-Level NPC Inverter Module

NXH600N105L7F5S1HG, NXH600N105L7F5P1HG

The NXH600N105L7F5S1HG/P1HG is a power module in F5BP 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, higher power and superior reliability.

Features

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

Typical Applications

- Energy Storage System
- Solar Inverters

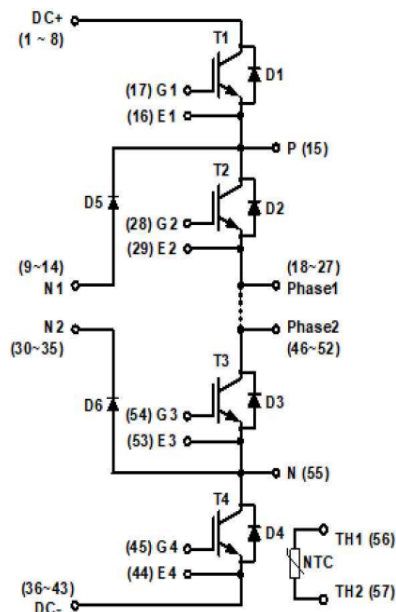
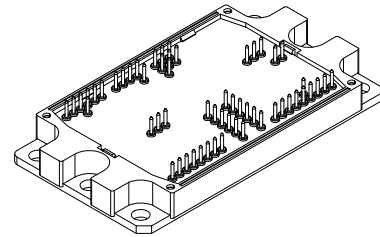
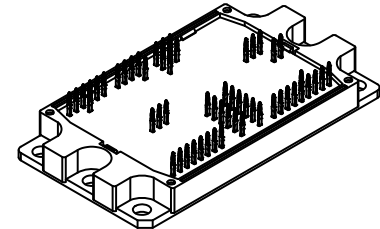


Figure 1. NXH600N105L7F5S1HG/P1HG Schematic Diagram

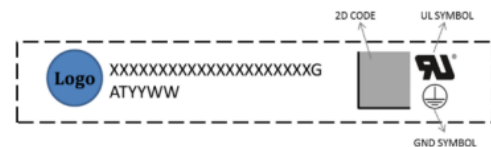


PIM57 112.00x62.00x12.00 (SOLDER PIN)
CASE 180CX



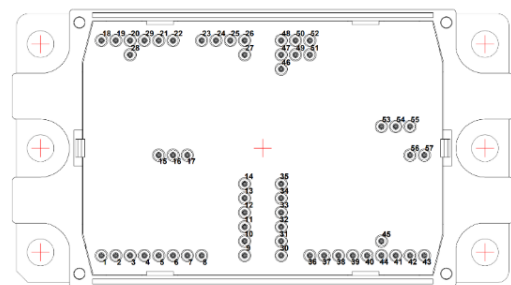
PIM57 112.00x62.00x12.00 (PRESS FIT PIN)
CASE 180JC

MARKING DIAGRAM



XXXXXX = 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.

NXH600N105L7F5S1HG, NXH600N105L7F5P1HG

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_{sCE}	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.

ABSOLUTE MAXIMUM RATINGS ($T_J = 25^\circ\text{C}$ unless otherwise noted)

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

OUTER IGBT (T1, T4)

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

INNER IGBT (T2, T3)

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

NEUTRAL POINT DIODE (D5, D6)

Peak Repetitive Reverse Voltage	V_{RRM}	1050	V
Continuous Forward Current @ $T_c = 80^\circ\text{C}$ ($T_J = 175^\circ\text{C}$)	I_F	186	A
Repetitive Peak Forward Current ($T_J = 175^\circ\text{C}$), $T_{pulse} = 1$ ms	I_{FRM}	558	A
Maximum Power Dissipation @ $T_c = 80^\circ\text{C}$ ($T_J = 175^\circ\text{C}$)	P_{tot}	475	W
Minimum Operating Junction Temperature	T_{JMIN}	-40	°C
Maximum Operating Junction Temperature	T_{JMAX}	175	°C

INVERSE DIODES (D1, D4)

Peak Repetitive Reverse Voltage	V_{RRM}	1050	V
Continuous Forward Current @ $T_c = 80^\circ\text{C}$ ($T_J = 175^\circ\text{C}$)	I_F	278	A
Repetitive Peak Forward Current ($T_J = 175^\circ\text{C}$), $T_{pulse} = 1$ ms	I_{FRM}	834	A

NXH600N105L7F5S1HG, NXH600N105L7F5P1HG

ABSOLUTE MAXIMUM RATINGS ($T_J = 25^\circ\text{C}$ unless otherwise noted) (continued)

Parameter	Symbol	Value	Unit
INVERSE DIODES (D1, D4)			
Maximum Power Dissipation @ $T_c = 80^\circ\text{C}$ ($T_J = 175^\circ\text{C}$)	P_{tot}	766	W
Minimum Operating Junction Temperature	$T_{J\text{MIN}}$	-40	$^\circ\text{C}$
Maximum Operating Junction Temperature	$T_{J\text{MAX}}$	175	$^\circ\text{C}$
INVERSE DIODES (D2, D3)			
Peak Repetitive Reverse Voltage	V_{RRM}	1050	V
Continuous Forward Current @ $T_c = 80^\circ\text{C}$ ($T_J = 175^\circ\text{C}$)	I_F	297	A
Repetitive Peak Forward Current ($T_J = 175^\circ\text{C}$), $T_{\text{pulse}} = 1 \text{ ms}$	I_{FRM}	891	A
Maximum Power Dissipation @ $T_c = 80^\circ\text{C}$ ($T_J = 175^\circ\text{C}$)	P_{tot}	833	W
Minimum Operating Junction Temperature	$T_{J\text{MIN}}$	-40	$^\circ\text{C}$
Maximum Operating Junction Temperature	$T_{J\text{MAX}}$	175	$^\circ\text{C}$

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 ($T_J = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
OUTER IGBT (T1, T4)						
Collector-Emitter Cutoff Current	$V_{\text{GE}} = 0 \text{ V}$, $V_{\text{CE}} = 1050 \text{ V}$	I_{CES}	–	–	500	μA
Collector-Emitter Saturation Voltage	$V_{\text{GE}} = 15 \text{ V}$, $I_C = 600 \text{ A}$, $T_J = 25^\circ\text{C}$	$V_{\text{CE(sat)}}$	–	1.6	2.3	V
	$V_{\text{GE}} = 15 \text{ V}$, $I_C = 600 \text{ A}$, $T_J = 150^\circ\text{C}$		–	2.0	–	
Gate-Emitter Threshold Voltage	$V_{\text{GE}} = V_{\text{CE}}$, $I_C = 600 \text{ mA}$	$V_{\text{GE(TH)}}$	4.0	5.5	6.9	V
Gate Leakage Current	$V_{\text{GE}} = 20 \text{ V}$, $V_{\text{CE}} = 0 \text{ V}$	I_{GES}	–	–	1	μA
Internal Gate Resistor		R_g	–	0.58	–	Ω
Turn-off safe operating area	$V_{\text{CC}} < 800 \text{ V}$, $R_{g, \text{off}} \geq 30 \Omega$, $T_{vj} < 150^\circ\text{C}$		–	800	–	A
Turn-on Delay Time	$T_J = 25^\circ\text{C}$ $V_{\text{CE}} = 600 \text{ V}$, $I_C = 200 \text{ A}$ $V_{\text{GE}} = -9 \text{ V to } +15 \text{ V}$, $R_{g, \text{on}} = 7 \Omega$, $R_{g, \text{off}} = 21 \Omega$	$t_{d(\text{on})}$	–	224	–	ns
Rise Time		t_r	–	47	–	
Turn-off Delay Time		$t_{d(\text{off})}$	–	1588	–	
Fall Time		t_f	–	13	–	
Turn-on Switching Loss per Pulse		E_{on}	–	9700	–	μJ
Turn off Switching Loss per Pulse		E_{off}	–	7540	–	
Turn-on Delay Time	$T_J = 125^\circ\text{C}$ $V_{\text{CE}} = 600 \text{ V}$, $I_C = 200 \text{ A}$ $V_{\text{GE}} = -9 \text{ V to } +15 \text{ V}$, $R_{g, \text{on}} = 7 \Omega$, $R_{g, \text{off}} = 21 \Omega$	$t_{d(\text{on})}$	–	204	–	ns
Rise Time		t_r	–	50	–	
Turn-off Delay Time		$t_{d(\text{off})}$	–	1693	–	
Fall Time		t_f	–	23	–	
Turn-on Switching Loss per Pulse		E_{on}	–	15430	–	μJ
Turn off Switching Loss per Pulse		E_{off}	–	10800	–	
Input Capacitance	$V_{\text{CE}} = 20 \text{ V}$, $V_{\text{GE}} = 0 \text{ V}$, $f = 100 \text{ kHz}$	C_{ies}	–	48597	–	pF
Output Capacitance		C_{oes}	–	1836	–	
Reverse Transfer Capacitance		C_{res}	–	277	–	
Total Gate Charge	$V_{\text{CE}} = 600 \text{ V}$, $I_C = 57 \text{ A}$, $V_{\text{GE}} = -15/+20 \text{ V}$	Q_g	–	3048	–	nC

NXH600N105L7F5S1HG, NXH600N105L7F5P1HG

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

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
OUTER IGBT (T1, T4)						
Thermal Resistance – Chip-to-heatsink	Thermal grease, Thickness = 2 Mil ±2%, λ = 2.87 W/mK	R _{thJH}	–	0.139	–	°C/W
Thermal Resistance – Chip-to-case		R _{thJC}	–	0.088	–	°C/W
NEUTRAL POINT DIODE (D5, D6)						
Diode Forward Voltage	I _F = 375 A, T _J = 25°C	V _F	–	2.8	3.4	V
	I _F = 375 A, T _J = 150°C		–	2.4	–	
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	t _{rr}	–	135	–	ns
Reverse Recovery Charge		Q _{rr}	–	8.73	–	μC
Peak Reverse Recovery Current		I _{RRM}	–	175	–	A
Peak Rate of Fall of Recovery Current		di/dt	–	3.61	–	A/ns
Reverse Recovery Energy		E _{rr}	–	2771	–	μJ
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	t _{rr}	–	197	–
Reverse Recovery Charge	Q _{rr}		–	22.7	–	μC
Peak Reverse Recovery Current	I _{RRM}		–	275	–	A
Peak Rate of Fall of Recovery Current	di/dt		–	3.34	–	A/ns
Reverse Recovery Energy	E _{rr}		–	7897	–	μJ
Thermal Resistance – Chip-to-heatsink	Thermal grease, Thickness = 2 Mil ±2%, λ = 2.87 W/mK		R _{thJH}	–	0.271	–
Thermal Resistance – Chip-to-case		R _{thJC}	–	0.200	–	°C/W
INNER IGBT (T2, T3)						
Collector-Emitter Cutoff Current	V _{GE} = 0 V, V _{CE} = 1050 V	I _{CES}	–	–	500	μA
Collector-Emitter Saturation Voltage	V _{GE} = 15 V, I _C = 600 A, T _J = 25°C	V _{CE(sat)}	–	1.6	2.3	V
	V _{GE} = 15 V, I _C = 600 A, T _J = 150°C		–	2.0	–	
Gate-Emitter Threshold Voltage	V _{GE} = V _{CE} , I _C = 600 mA	V _{GE(TH)}	4.0	5.5	6.9	V
Gate Leakage Current	V _{GE} = 20 V, V _{CE} = 0 V	I _{GES}	–	–	1	μA
Internal Gate Resistor		R _g	–	0.58	–	Ω
Turn-off Safe Operating Area	V _{CC} < 800 V, R _{G, off} ≥ 35 Ω, T _{vj} < 150°C		–	800	–	A
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} = 21 Ω	t _{d(on)}	–	240	–	ns
Rise Time		t _r	–	52	–	
Turn-off Delay Time		t _{d(off)}	–	1591	–	
Fall Time		t _f	–	17	–	
Turn-on Switching Loss per Pulse		E _{on}	–	10570	–	μJ
Turn-off Switching Loss per Pulse		E _{off}	–	8270	–	
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} = 21 Ω	t _{d(on)}	–	219	–
Rise Time	t _r		–	55	–	
Turn-off Delay Time	t _{d(off)}		–	1708	–	
Fall Time	t _f		–	19	–	
Turn-on Switching Loss per Pulse	E _{on}		–	15000	–	μJ
Turn-off Switching Loss per Pulse	E _{off}		–	10730	–	
Input Capacitance	V _{CE} = 20 V, V _{GE} = 0 V, f = 100 kHz	C _{ies}	–	48597	–	pF
Output Capacitance		C _{oes}	–	1836	–	
Reverse Transfer Capacitance		C _{res}	–	277	–	
Total Gate Charge	V _{CE} = 600 V, I _C = 57 A, V _{GE} = –15/+20 V	Q _g	–	3048	–	nC

NXH600N105L7F5S1HG, NXH600N105L7F5P1HG

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

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
INNER IGBT (T2, T3)						
Thermal Resistance – Chip-to-heatsink	Thermal grease, Thickness = 2 Mil ±2%, λ = 2.87 W/mK	R _{thJH}	–	0.139	–	°C/W
Thermal Resistance – Chip-to-case		R _{thJC}	–	0.088	–	°C/W

INVERSE DIODES (D1, D4)

Diode Forward Voltage	I _F = 500 A, T _J = 25°C	V _F	–	2.8	3.4	V
	I _F = 500 A, T _J = 150°C		–	2.4	–	
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	t _{rr}	–	109	–	ns
Reverse Recovery Charge		Q _{rr}	–	7.87	–	μC
Peak Reverse Recovery Current		I _{RRM}	–	155	–	A
Peak Rate of Fall of Recovery Current		di/dt	–	3.11	–	A/ns
Reverse Recovery Energy		E _{rr}	–	2377	–	μJ
Reverse Recovery Time		t _{rr}	–	170	–	ns
Reverse Recovery Charge	T _J = 125°C V _{CE} = 600 V, I _C = 200 A V _{GE} = –9 V to +15 V, R _{G, on} = 7 Ω	Q _{rr}	–	22	–	μC
Peak Reverse Recovery Current		I _{RRM}	–	231	–	A
Peak Rate of Fall of Recovery Current		di/dt	–	2.98	–	A/ns
Reverse Recovery Energy		E _{rr}	–	8019	–	μJ
Thermal Resistance – Chip-to-heatsink		R _{thJH}	–	0.178	–	°C/W
Thermal Resistance – Chip-to-case		R _{thJC}	–	0.114	–	°C/W

INVERSE DIODES (D2, D3)

Diode Forward Voltage	I _F = 500 A, T _J = 25°C	V _F	–	2.8	3.4	V
	I _F = 500 A, T _J = 150°C		–	2.4	–	
Thermal Resistance – Chip-to-heatsink	Thermal grease, Thickness = 2 Mil ±2%, λ = 2.87 W/mK	R _{thJH}	–	0.194	–	°C/W
Thermal Resistance – Chip-to-case		R _{thJC}	–	0.124	–	°C/W

THERMISTOR CHARACTERISTICS

Nominal Resistance	T = 25°C	R ₂₅	–	5	–	kΩ
Nominal Resistance	T = 100°C	R ₁₀₀	–	492.2	–	Ω
Deviation of R25		R/R	–1	–	1	%
Power Dissipation		P _D	–	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

Device	Marking	Package	Shipping
NXH600N105L7F5S1HG	NXH600N105L7F5S1HG	F5 – PIM57 112x62x12.00 (Solder PIN) (Pb-Free / Halide Free)	8 Units / Blister Tray
NXH600N105L7F5P1HG	NXH600N105L7F5P1HG	F5 – PIM57 112x62x12.00 (Press Fit PIN) (Pb-Free / Halide Free)	8 Units / Blister Tray

NXH600N105L7F5S1HG, NXH600N105L7F5P1HG

TYPICAL CHARACTERISTIC – T1, T2, T3, T4 (IGBT)

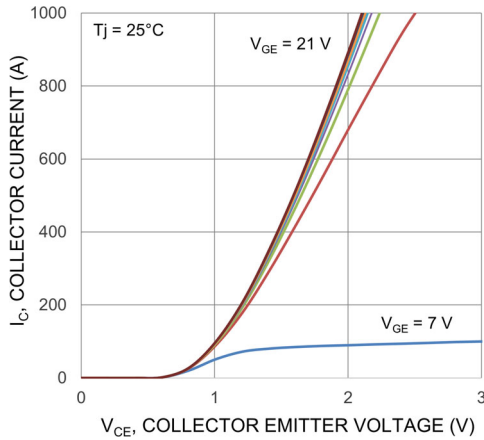


Figure 2. Typical Output Characteristics – IGBT

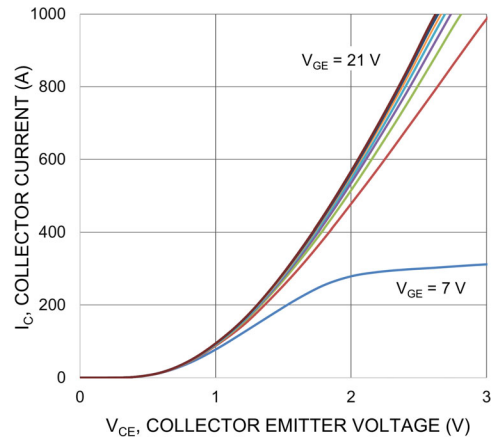


Figure 3. Typical Output Characteristics – IGBT

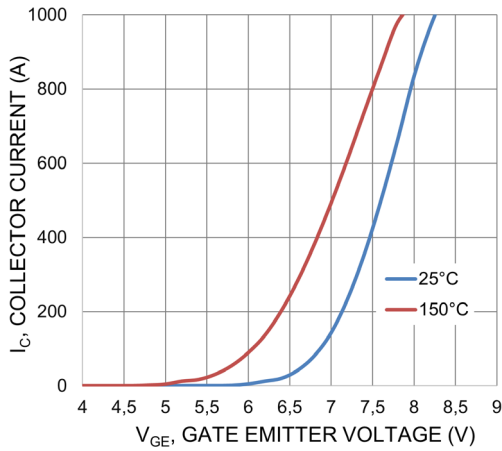


Figure 4. Transfer Characteristics – IGBT

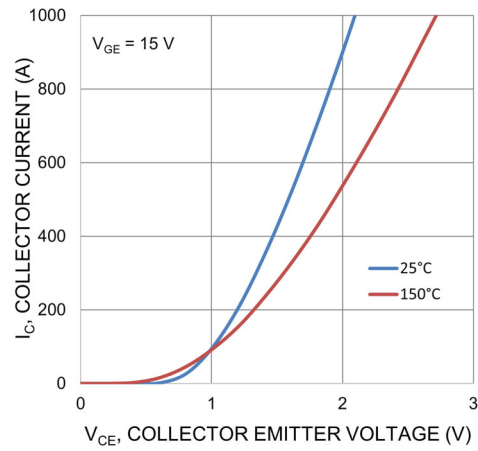


Figure 5. Saturation Voltage Characteristic – IGBT

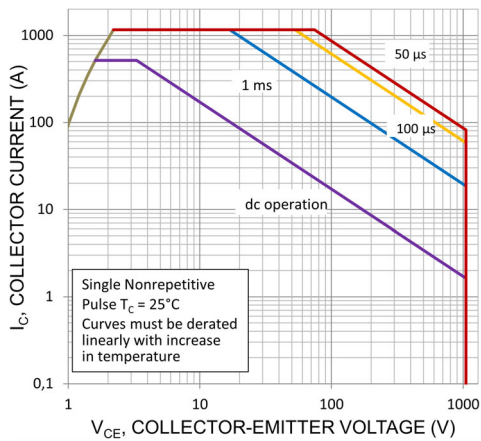


Figure 6. FBSOA

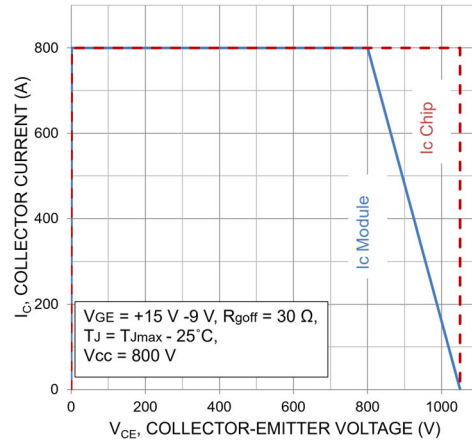


Figure 7. RBSOA (T1-T4)

NXH600N105L7F5S1HG, NXH600N105L7F5P1HG

TYPICAL CHARACTERISTIC – T1, T2, T3, T4 (IGBT) (CONTINUED)

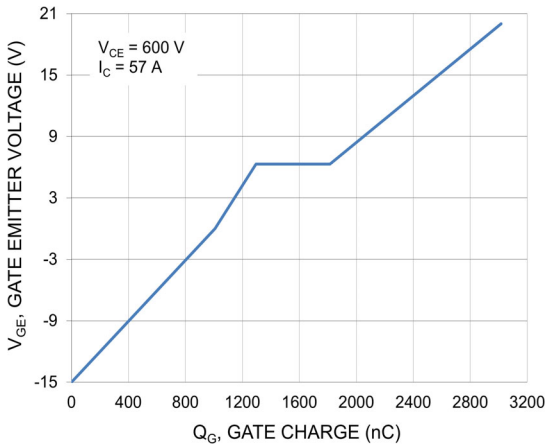


Figure 8. Gate Voltage vs. Gate Charge

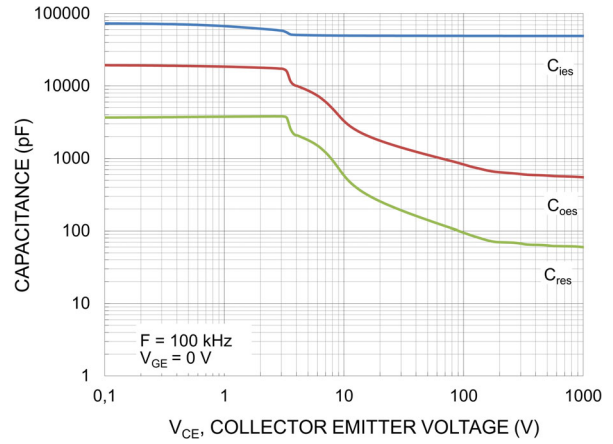


Figure 9. Capacitance vs. V_{CE}

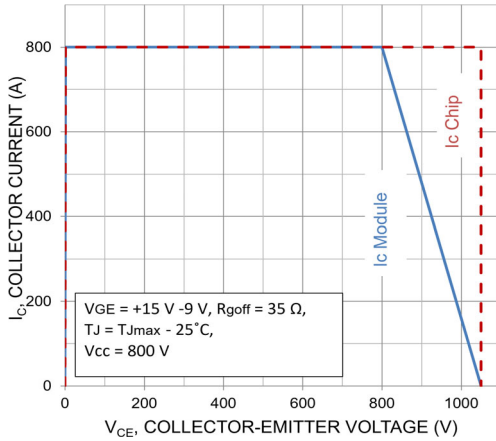


Figure 10. RBSOA (T2-T3)

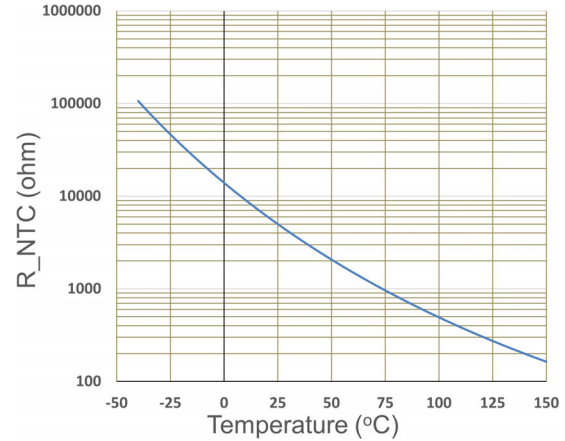


Figure 11. Temperature vs. NTC Value

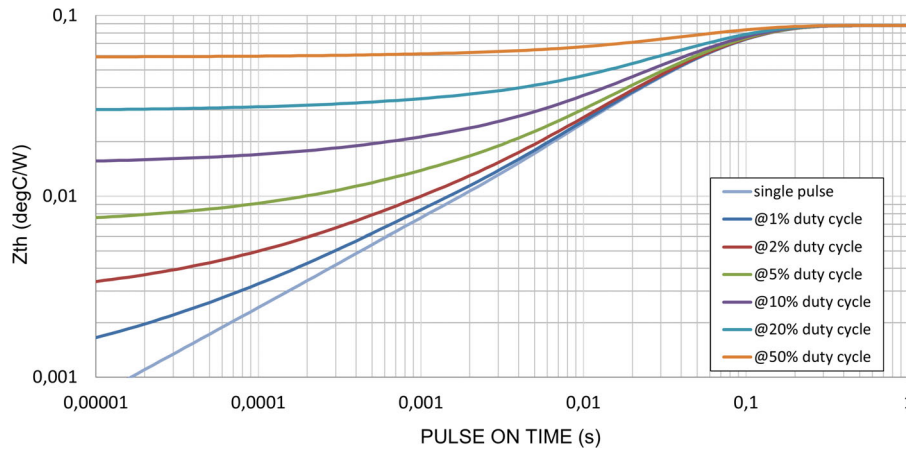


Figure 12. Transient Thermal Impedance (IGBT Z_{thjc})

NXH600N105L7F5S1HG, NXH600N105L7F5P1HG

TYPICAL CHARACTERISTIC – D1, D4 (INVERSE DIODE)

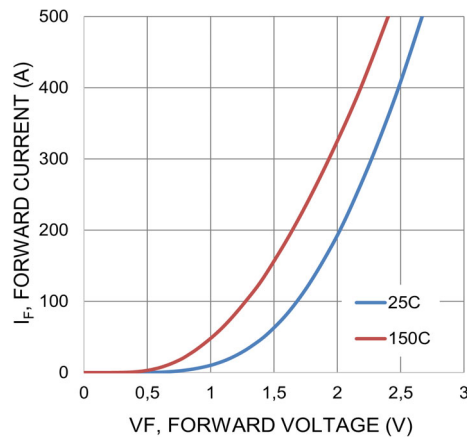


Figure 13. Inverse Diode Forward Characteristics

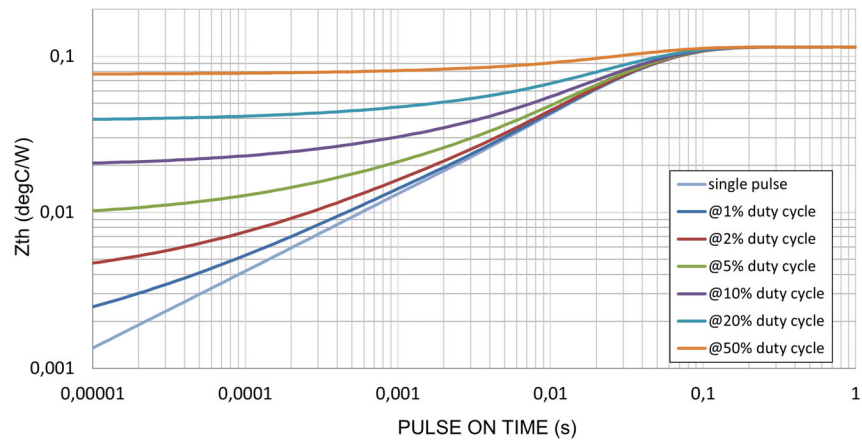


Figure 14. Transient Thermal Impedance (Inverse Diode Z_{thjc})

TYPICAL CHARACTERISTIC – D2, D3 (INVERSE DIODE)

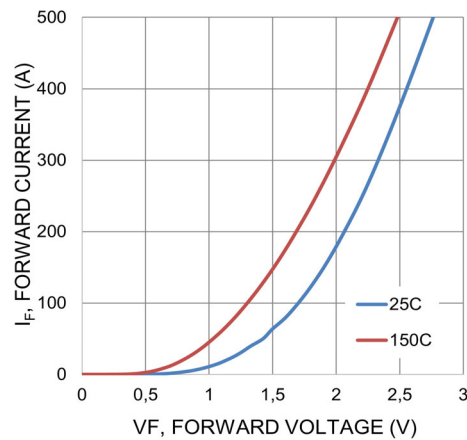


Figure 15. Inverse Diode Forward Characteristics

NXH600N105L7F5S1HG, NXH600N105L7F5P1HG

TYPICAL CHARACTERISTIC – D2, D3 (INVERSE DIODE) (CONTINUED)

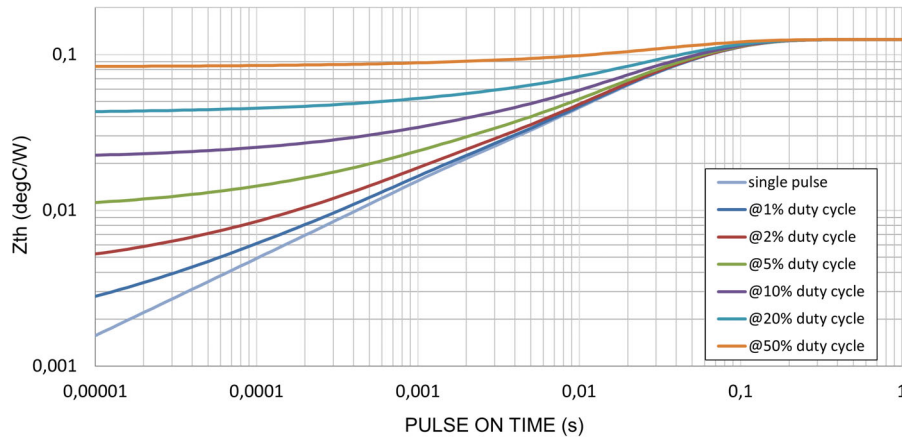


Figure 16. Transient Thermal Impedance (Inverse Diode Z_{thjc})

TYPICAL CHARACTERISTIC – D5, D6 (NEUTRAL POINT DIODE)

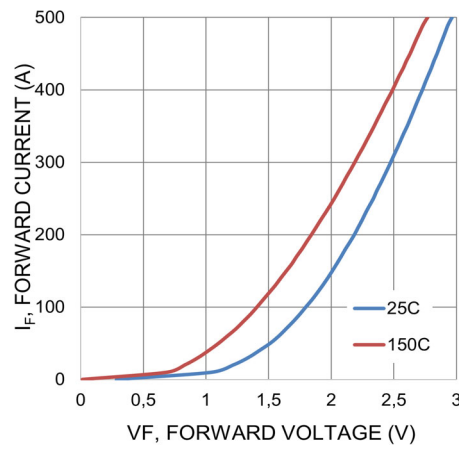


Figure 17. Neutral Diode Forward Characteristics

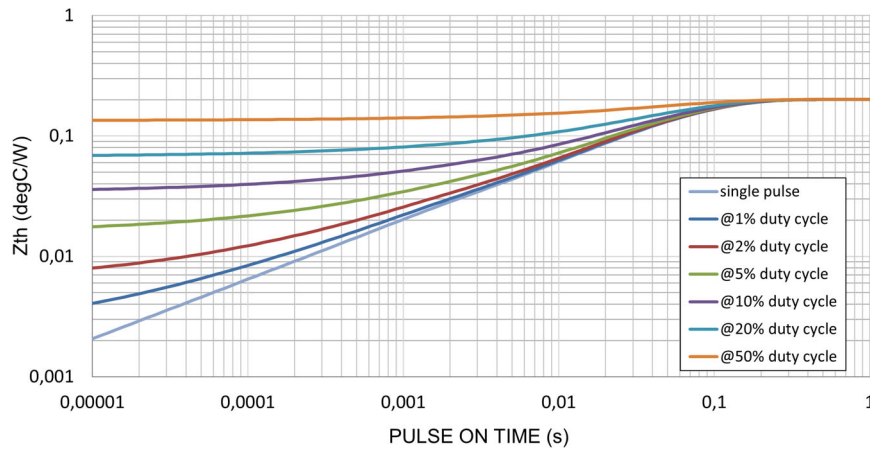


Figure 18. Transient Thermal Impedance (Neutral Point Diode Z_{thjc})

NXH600N105L7F5S1HG, NXH600N105L7F5P1HG

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

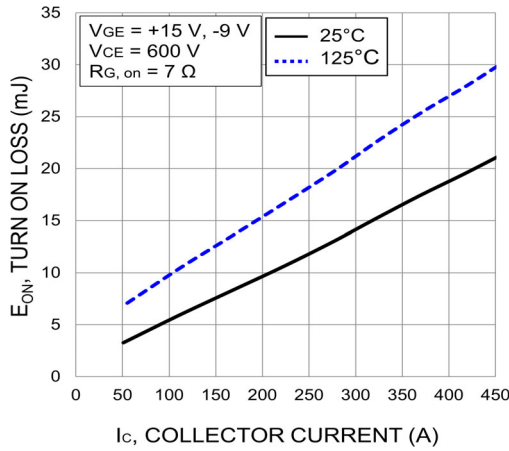


Figure 19. Typical Turn On Loss vs. I_C

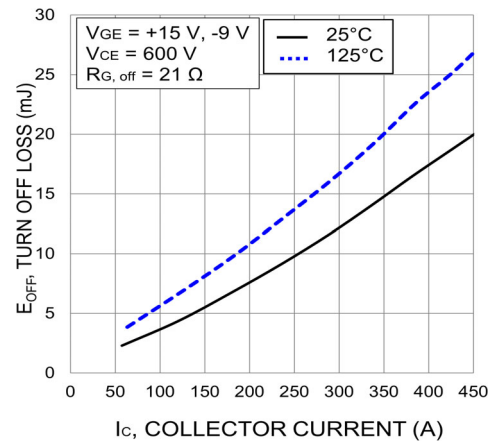


Figure 20. Typical Turn Off Loss vs. I_C

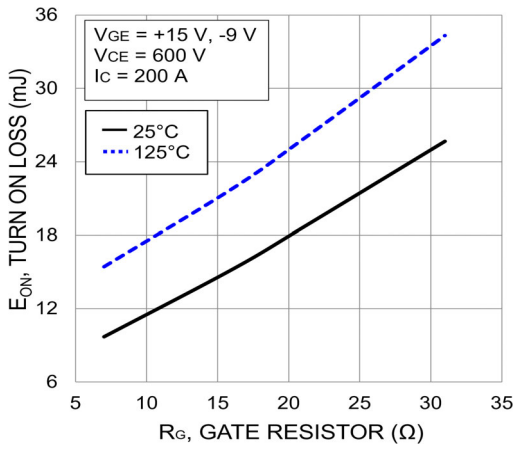


Figure 21. Typical Turn On Loss vs. R_G

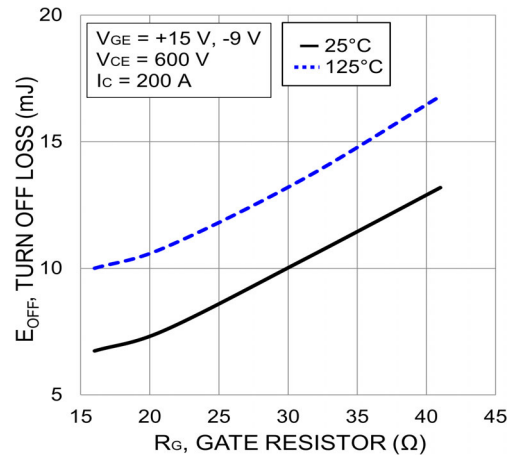


Figure 22. Typical Turn Off Loss vs. R_G

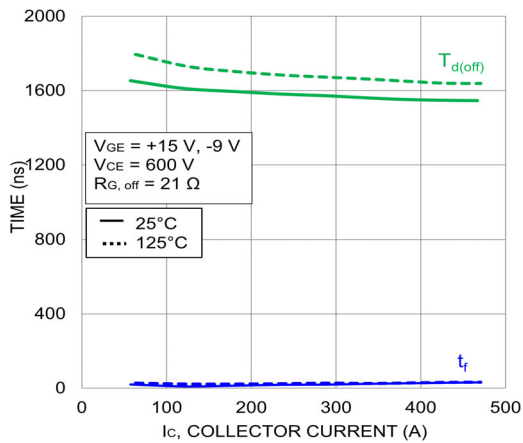


Figure 23. Typical Turn-Off Switching Time vs. I_C

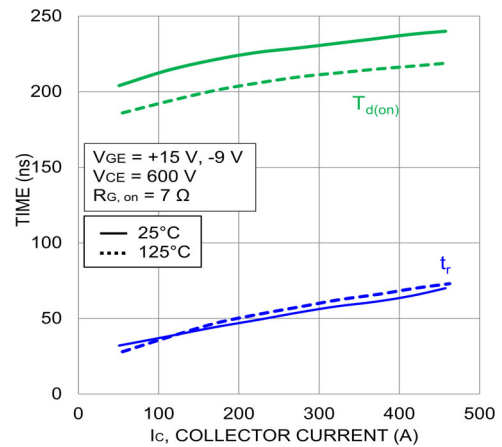


Figure 24. Typical Turn-On Switching Time vs. I_C

NXH600N105L7F5S1HG, NXH600N105L7F5P1HG

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

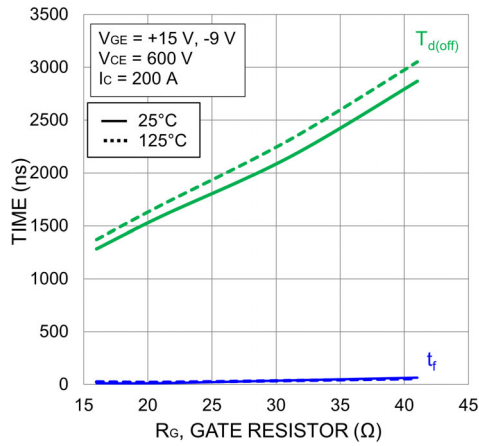


Figure 25. Typical Turn-Off Switching Time vs. R_G

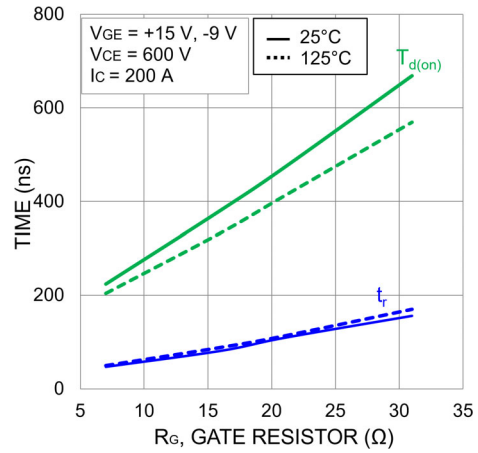


Figure 26. Typical Turn-On Switching Time vs. R_G

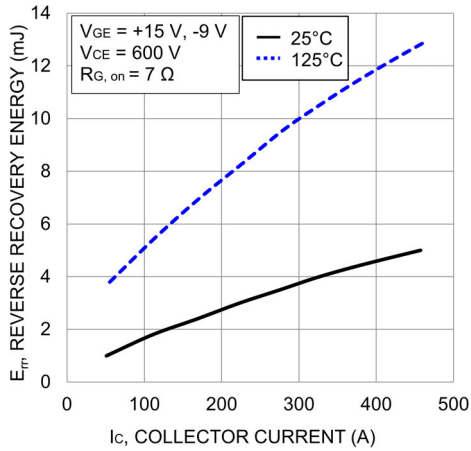


Figure 27. Typical Reverse Recovery Energy Loss vs. I_C

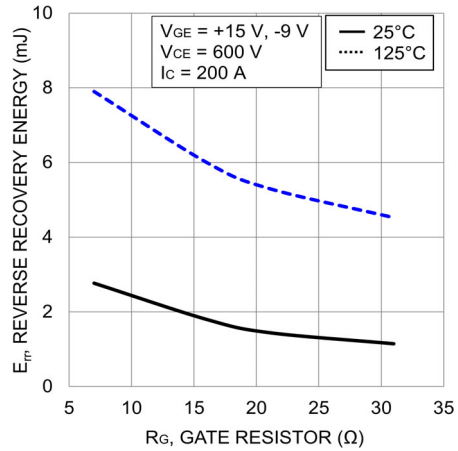


Figure 28. Typical Reverse Recovery Energy Loss vs. R_G

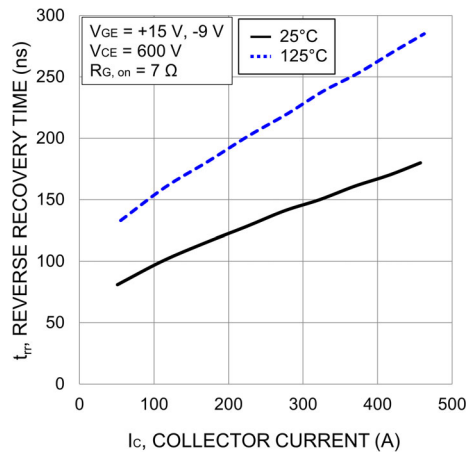


Figure 29. Typical Reverse Recovery Time vs. I_C

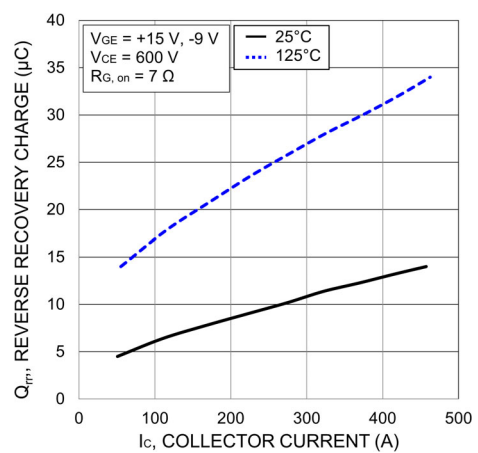


Figure 30. Typical Reverse Recovery Charge vs. I_C

NXH600N105L7F5S1HG, NXH600N105L7F5P1HG

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

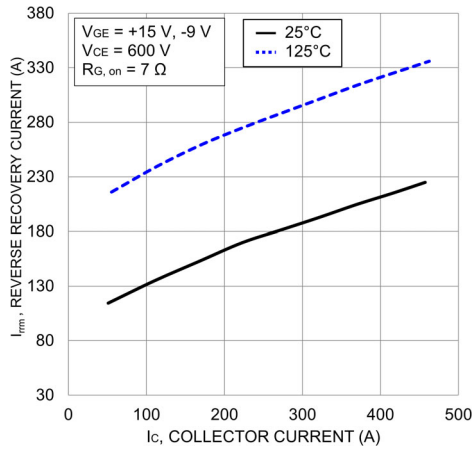


Figure 31. Typical Reverse Recovery Current vs. I_C

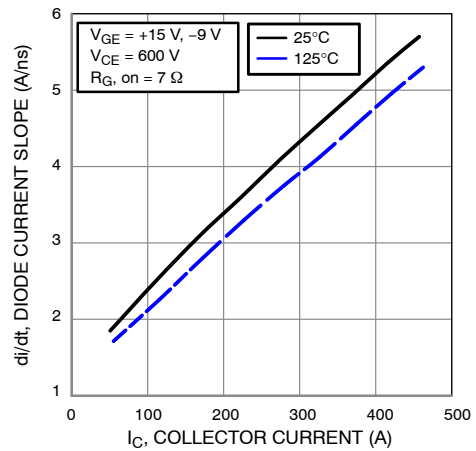


Figure 32. Typical di/dt vs. I_C

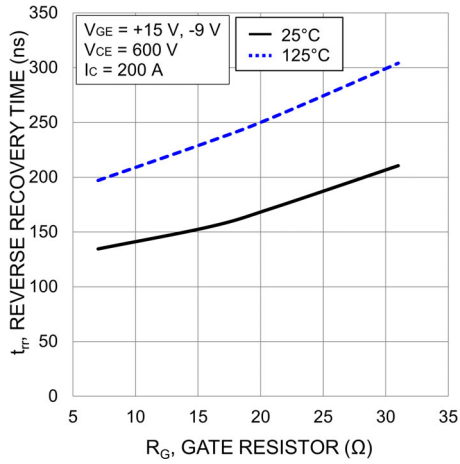


Figure 33. Typical Reverse Recovery Time vs. R_G

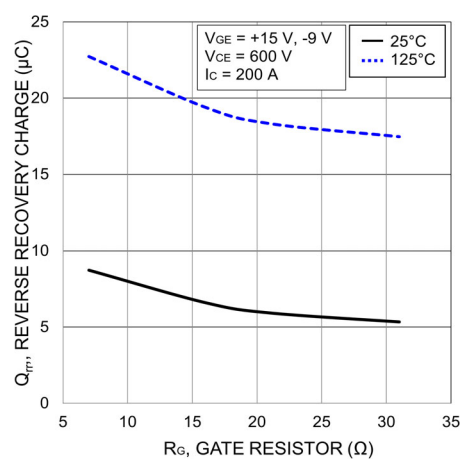


Figure 34. Typical Reverse Recovery Charge vs. R_G

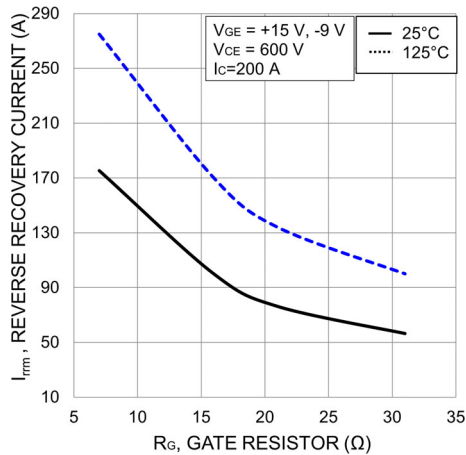


Figure 35. Typical Reverse Recovery Peak Current vs. R_G

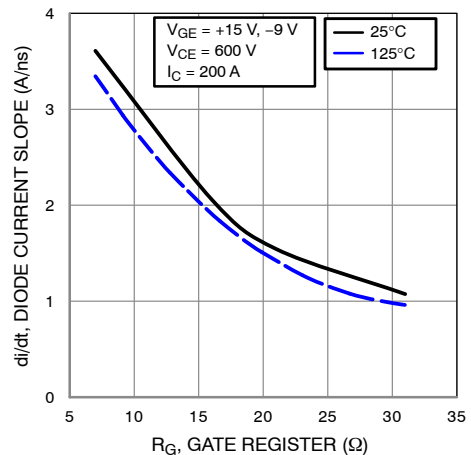


Figure 36. Typical di/dt vs. R_G

NXH600N105L7F5S1HG, NXH600N105L7F5P1HG

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

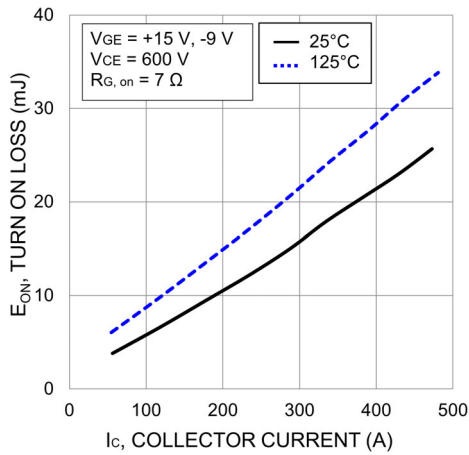


Figure 37. Typical Turn On Loss vs. I_C

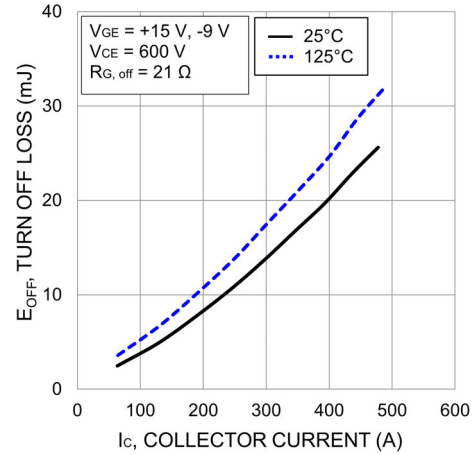


Figure 38. Typical Turn Off Loss vs. I_C

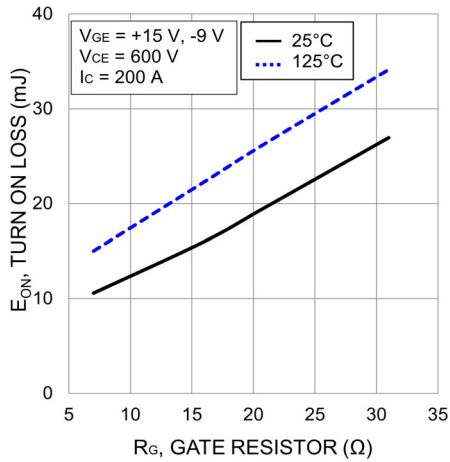


Figure 39. Typical Turn On Loss vs. R_G

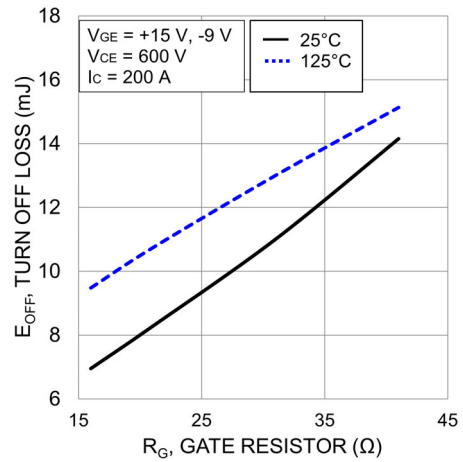


Figure 40. Typical Turn Off Loss vs. R_G

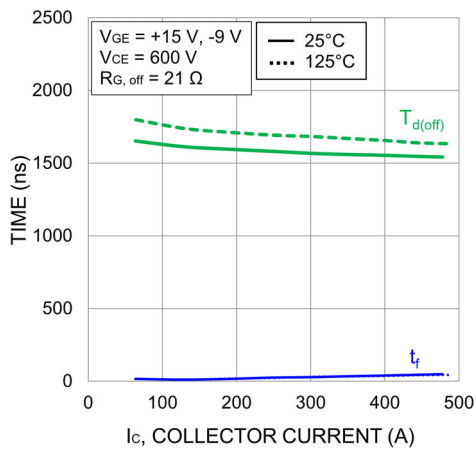


Figure 41. Typical Turn-Off Switching Time vs. I_C

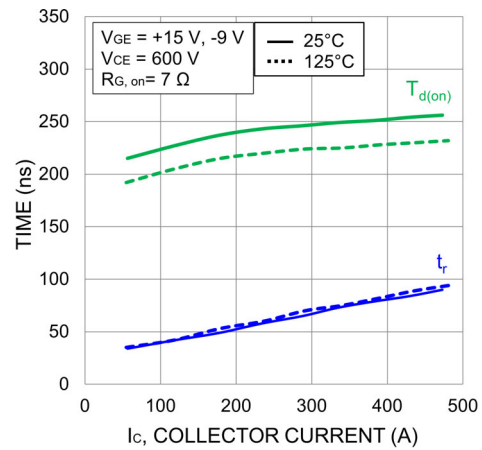


Figure 42. Typical Turn-On Switching Time vs. I_C

NXH600N105L7F5S1HG, NXH600N105L7F5P1HG

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

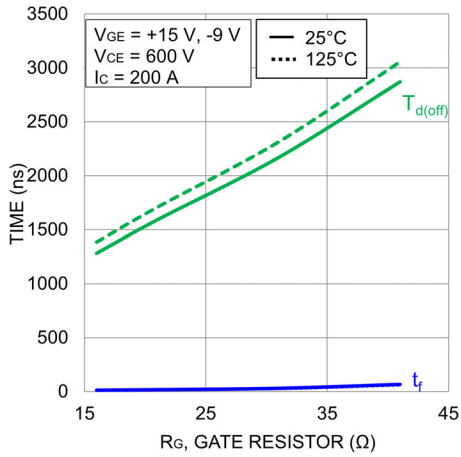


Figure 43. Typical Turn-Off Switching Time vs. R_G

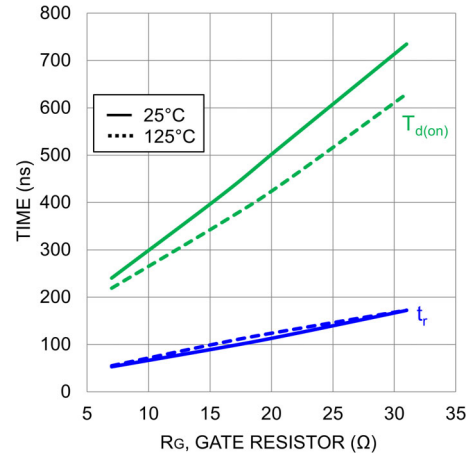


Figure 44. Typical Turn-On Switching Time vs. R_G

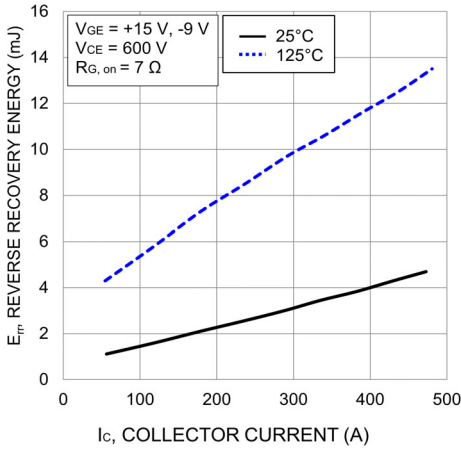


Figure 45. Typical Reverse Recovery Energy Loss vs. I_C

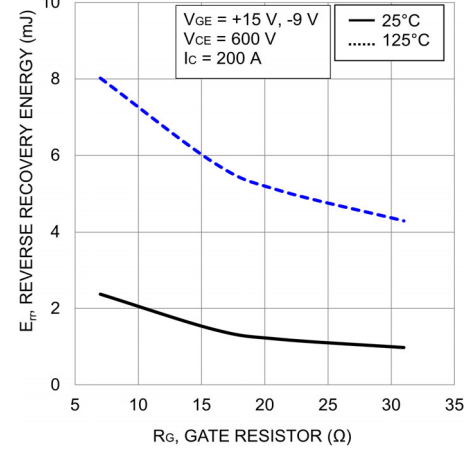


Figure 46. Typical Reverse Recovery Energy Loss vs. R_G

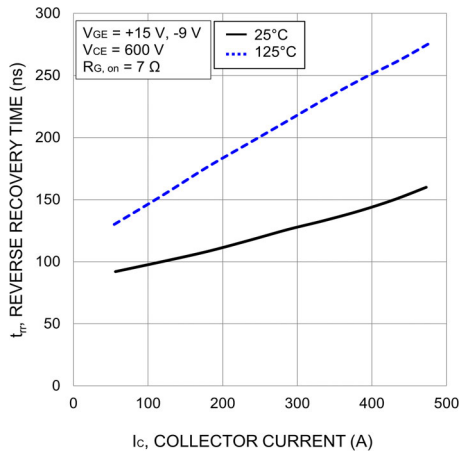


Figure 47. Typical Reverse Recovery Time vs. I_C

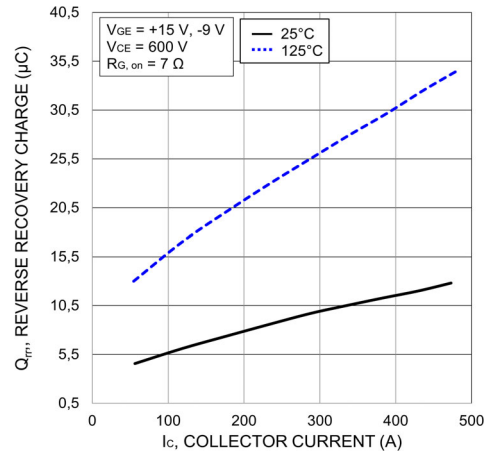


Figure 48. Typical Reverse Recovery Charge vs. I_C

NXH600N105L7F5S1HG, NXH600N105L7F5P1HG

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

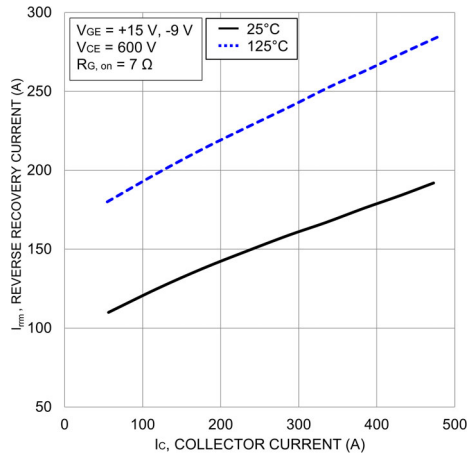


Figure 49. Typical Reverse Recovery Current vs. I_C

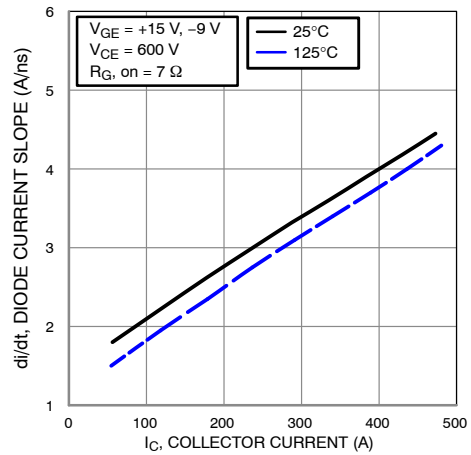


Figure 50. Typical di/dt vs. I_C

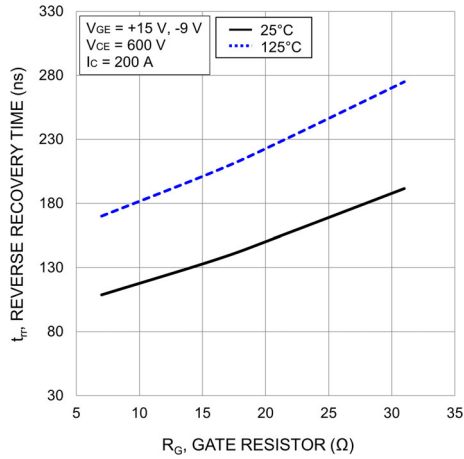


Figure 51. Typical Reverse Recovery Time vs. R_G

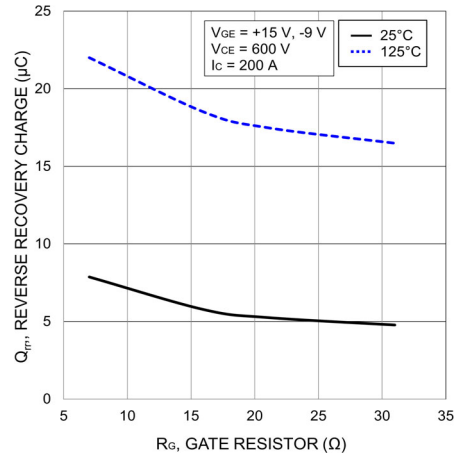


Figure 52. Typical Reverse Recovery Charge vs. R_G

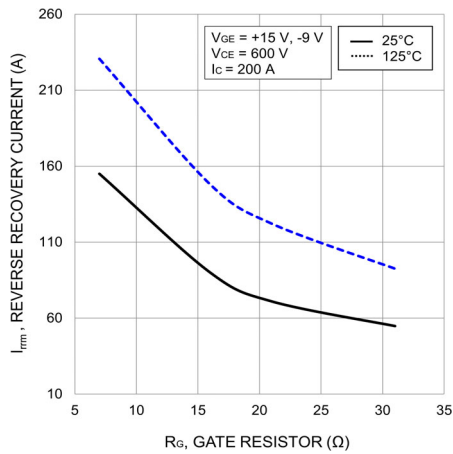


Figure 53. Typical Reverse Recovery Peak Current vs. R_G

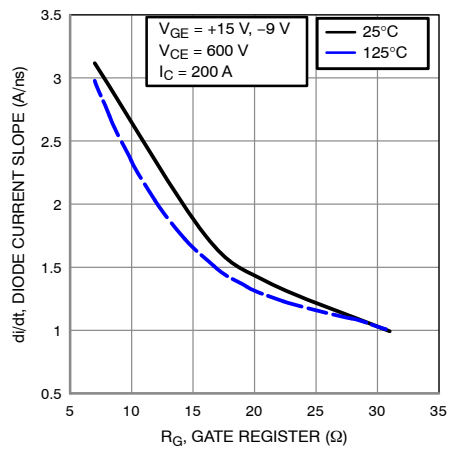
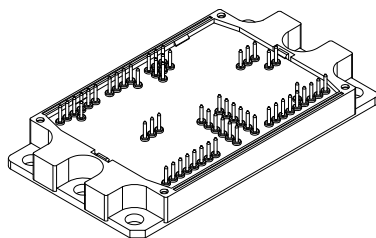


Figure 54. Typical di/dt vs. R_G

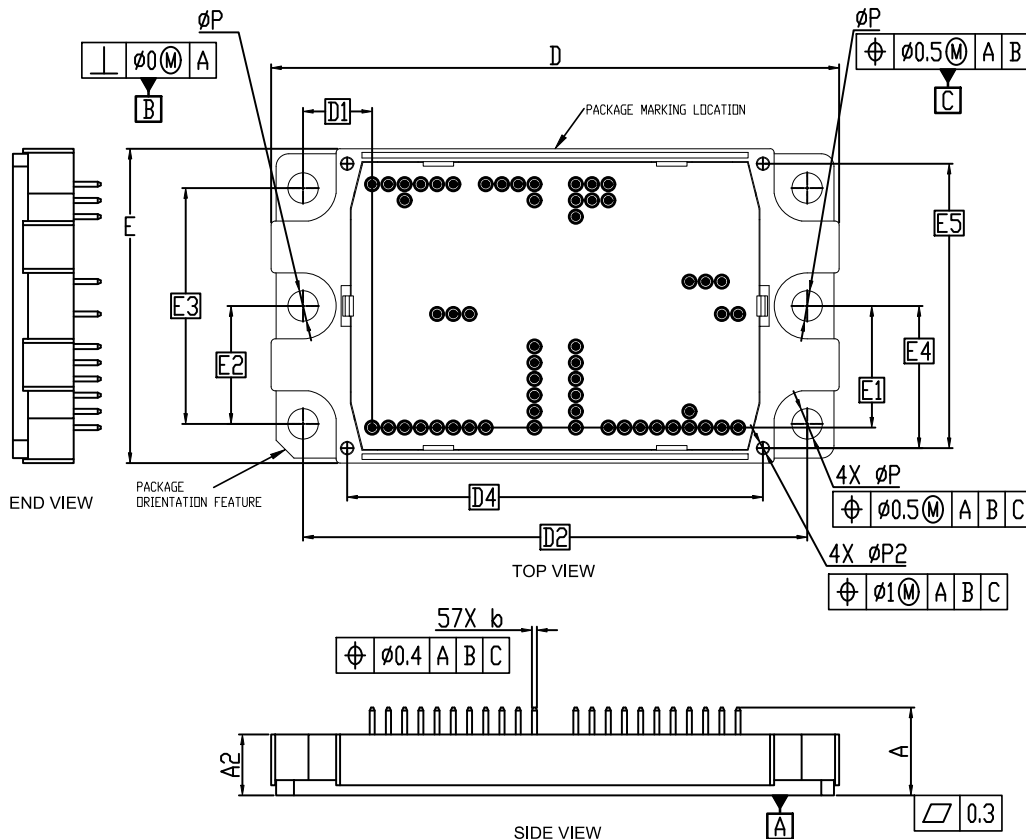


PIM57 112.00x62.00x12.00
CASE 180CX
ISSUE O

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: 98AON63831H

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

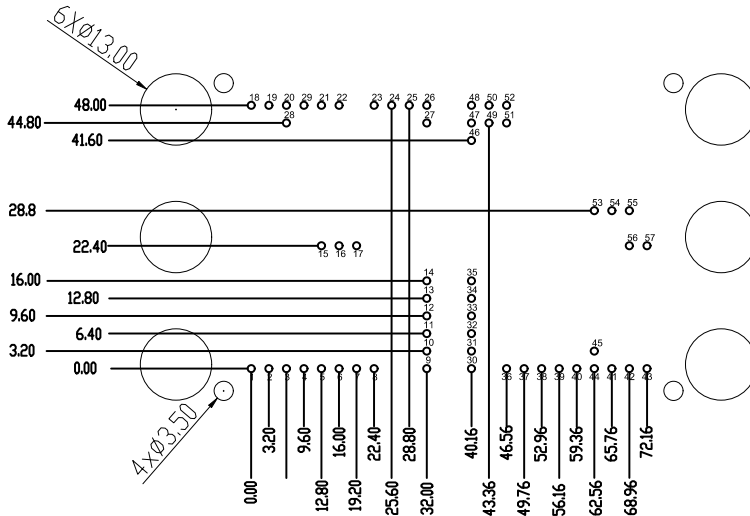
DESCRIPTION: PIM57 112.00x62.00x12.00

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.

PIM57 112.00x62.00x12.00
CASE 180CX
ISSUE O

DATE 30 JUL 2024



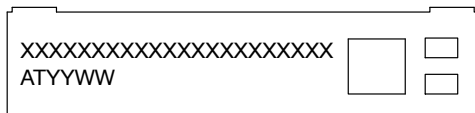
RECOMMENDED
MOUNTING PATTERN

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

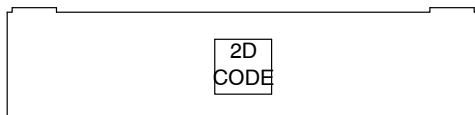
NOTE 2:

Pin table								
Pin	X	Y	Pin	X	Y	Pin	X	Y
1	0	0	23	22.4	48	45	62.56	3.2
2	3.2	0	24	25.6	48	46	40.16	41.6
3	6.4	0	25	28.8	48	47	40.16	44.8
4	9.6	0	26	32	48	48	40.16	48
5	12.8	0	27	32	44.8	49	43.36	44.8
6	16	0	28	6.4	44.8	50	43.36	48
7	19.2	0	29	9.6	48	51	46.56	44.8
8	22.4	0	30	40.16	0	52	46.56	48
9	32	0	31	40.16	3.2	53	62.56	28.8
10	32	3.2	32	40.16	6.4	54	65.76	28.8
11	32	6.4	33	40.16	9.6	55	68.96	28.8
12	32	9.6	34	40.16	12.8	56	68.96	22.4
13	32	12.8	35	40.16	16	57	72.16	22.4
14	32	16	36	46.56	0			
15	12.8	22.4	37	49.76	0			
16	16	22.4	38	52.96	0			
17	19.2	22.4	39	56.16	0			
18	0	48	40	59.36	0			
19	3.2	48	41	65.76	0			
20	6.4	48	42	68.96	0			
21	12.8	48	43	72.16	0			
22	16	48	44	62.56	0			

GENERIC
MARKING DIAGRAM*



FRONTSIDE MARKING



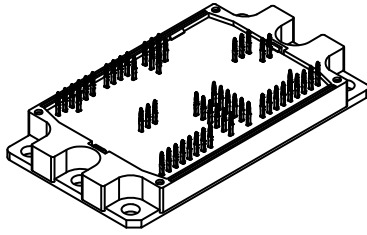
BACKSIDE MARKING

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:	98AON63831H	Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.
DESCRIPTION:	PIM57 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.



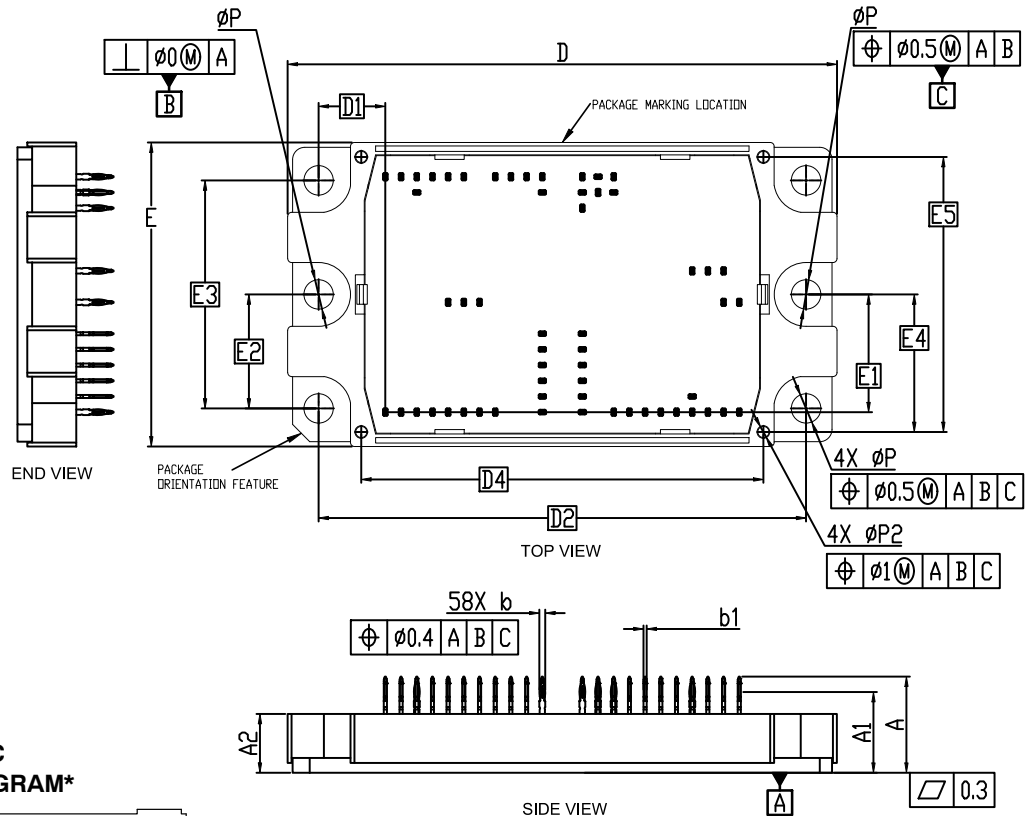
PIM57 112.00x62.00x12.00
CASE 180JC
ISSUE O

DATE 20 SEP 2024

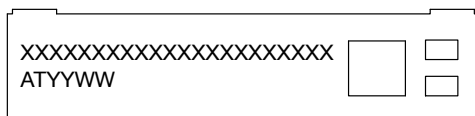
NOTES:

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.

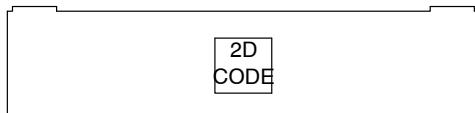
DIM	MILLIMETERS		
	MIN.	NOM.	MAX.
A	19.20	19.60	20.00
A1	16.25	16.45	16.65
A2	11.70	12.00	12.30
b	1.15	1.20	1.25
b1	0.59	0.64	0.69
D	111.60	112.00	112.40
D1		13.62 BSC	
D2		99.40 BSC	
D4		82.00 BSC	
E	61.60	62.00	62.40
E1		24.00 BSC	
E2		23.25 BSC	
E3		46.50 BSC	
E4		28.05 BSC	
E5		56.10 BSC	
P	5.90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



GENERIC
MARKING DIAGRAM*



FRONTSIDE MARKING



BACKSIDE MARKING

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

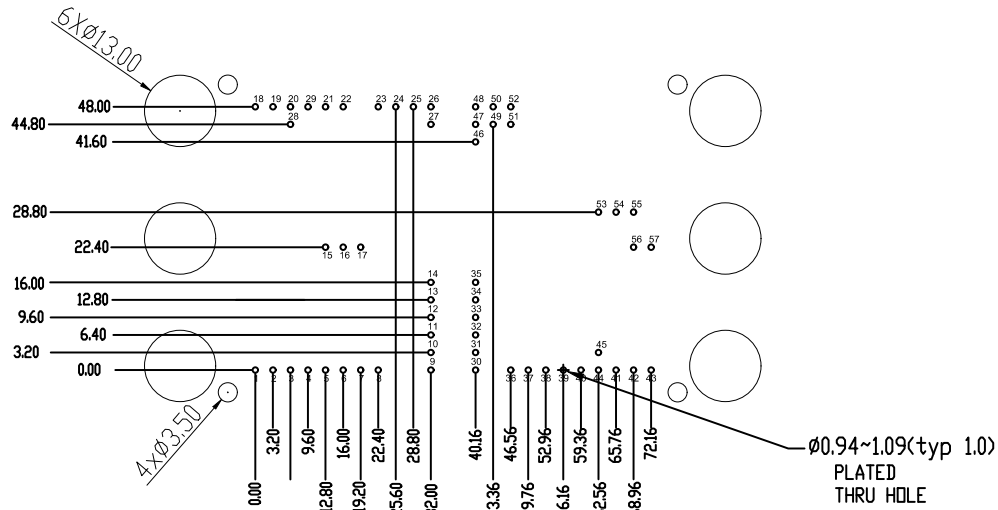
*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "▪", may or may not be present. Some products may not follow the Generic Marking.

DOCUMENT NUMBER:	98AON64995H	Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.
DESCRIPTION:	PIM57 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.

PIM57 112.00x62.00x12.00
CASE 180JC
ISSUE O

DATE 20 SEP 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 table								
Pin	X	Y	Pin	X	Y	Pin	X	Y
1	0	0	23	22.4	48	45	62.56	3.2
2	3.2	0	24	25.6	48	46	40.16	41.6
3	6.4	0	25	28.8	48	47	40.16	44.8
4	9.6	0	26	32	48	48	40.16	48
5	12.8	0	27	32	44.8	49	43.36	44.8
6	16	0	28	6.4	44.8	50	43.36	48
7	19.2	0	29	9.6	48	51	46.56	44.8
8	22.4	0	30	40.16	0	52	46.56	48
9	32	0	31	40.16	3.2	53	62.56	28.8
10	32	3.2	32	40.16	6.4	54	65.76	28.8
11	32	6.4	33	40.16	9.6	55	68.96	28.8
12	32	9.6	34	40.16	12.8	56	68.96	22.4
13	32	12.8	35	40.16	16	57	72.16	22.4
14	32	16	36	46.56	0			
15	12.8	22.4	37	49.76	0			
16	16	22.4	38	52.96	0			
17	19.2	22.4	39	56.16	0			
18	0	48	40	59.36	0			
19	3.2	48	41	65.76	0			
20	6.4	48	42	68.96	0			
21	12.8	48	43	72.16	0			
22	16	48	44	62.56	0			

DOCUMENT NUMBER:	98AON64995H	Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.
DESCRIPTION:	PIM57 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