

# SNXH160T120L2Q1PG

## Q1PACK Module

This high-density, integrated power module combines high-performance IGBTs with rugged anti-parallel diodes.

### Features

- Extremely Efficient Trench with Fieldstop Technology
- Low Switching Loss Reduces System Power Dissipation
- Module Design Offers High Power Density
- Low Inductive Layout
- Q1PACK Package with Press-Fit Pins

### Typical Applications

- Solar Inverters
- Uninterruptable Power Supplies

### ABSOLUTE MAXIMUM RATINGS

Rating	Symbol	Value	Unit
<b>HALFBRIDGE IGBT INVERSE DIODE (D1, D4)</b>			
Peak Repetitive Reverse Voltage	$V_{RRM}$	1200	V
Forward Current, DC @ $T_h = 80^\circ\text{C}$	$I_F$	20	A
Repetitive Peak Forward Current $T_{\text{pulse}}$ limited by $T_{j\text{max}}$	$I_{FRM}$	80	A
Power Dissipation per Diode $T_j = T_{j\text{max}}$ $T_h = 80^\circ\text{C}$	$P_{\text{tot}}$	51	W
$I^2t$ – value (Surge applied at rated load conditions halfwave, single phase, 60 Hz)	$I^2t$	106	A <sup>2</sup> S
Maximum Junction Temperature	$T_j$	175	°C

### HALFBRIDGE IGBT (T1, T4)

Collector-emitter voltage	$V_{CES}$	1200	V
Collector current @ $T_h = 80^\circ\text{C}$	$I_C$	140	A
Pulsed Collector Current, $T_{\text{pulse}}$ Limited by $T_{j\text{max}}$	$I_{CM}$	480	A
Power Dissipation per IGBT $T_j = T_{j\text{max}}$ $T_h = 80^\circ\text{C}$	$P_{\text{tot}}$	280	W
Gate-emitter voltage	$V_{GE}$	$\pm 20$	V
Short Circuit Withstand Time $V_{GE} = 15\text{ V}$ , $V_{CE} = 600\text{ V}$ , $T_j \leq 150^\circ\text{C}$	$T_{SC}$	10	$\mu\text{s}$
Maximum Junction Temperature	$T_j$	175	°C

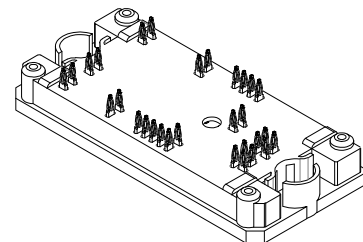
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.



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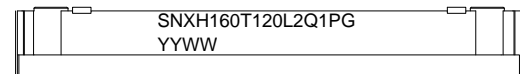
[www.onsemi.com](http://www.onsemi.com)

160 A, 1200 V (Bridge)  
150 A, 650 V (Neutral Point Clamp)  
T-Type Neutral Point Clamp



Q1PACK  
CASE 180AD

### DEVICE MARKING

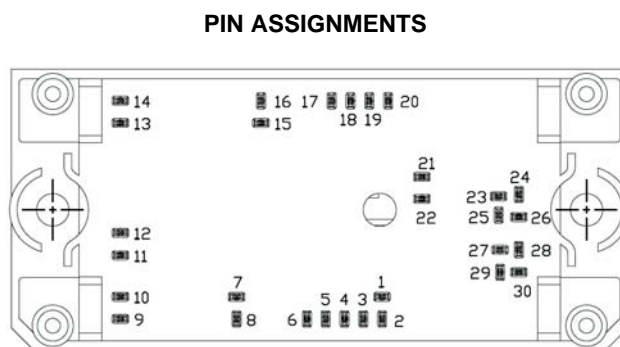
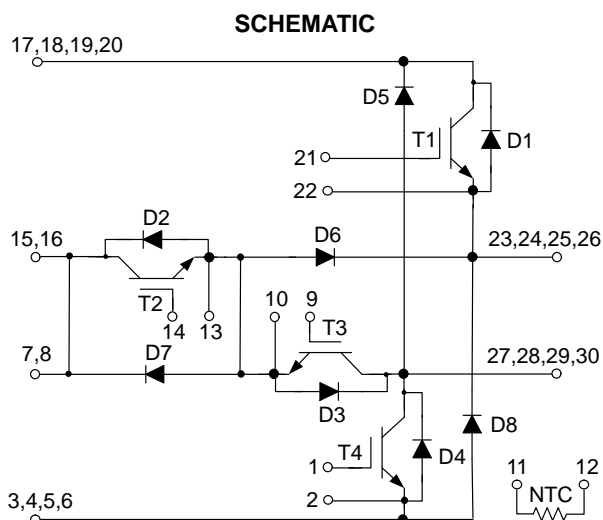


YYWW = Year and Work Week Code

### ORDERING INFORMATION

See detailed ordering and shipping information on page 15 of this data sheet.

# SNXH160T120L2Q1PG



**Table 1. ABSOLUTE MAXIMUM RATINGS**

Rating	Symbol	Value	Unit
<b>NP DIODE (D6, D7)</b>			
Peak Repetitive Reverse Voltage	$V_{RRM}$	650	V
Forward Current, DC @ $T_h = 80^\circ\text{C}$	$I_F$	58	A
Repetitive Peak Forward Current, $T_{\text{pulse}}$ limited by $T_{J\text{max}}$	$I_{FRM}$	200	A
Power Dissipation Per Diode $T_j = T_{j\text{max}}$ $T_h = 80^\circ\text{C}$	$P_{\text{tot}}$	89	W
Maximum Junction Temperature	$T_J$	175	$^\circ\text{C}$
<b>NP IGBT (T2, T3)</b>			
Collector-emitter voltage	$V_{CES}$	650	V
Collector current @ $T_h = 80^\circ\text{C}$	$I_c$	83	A
Pulsed collector current, $T_{\text{pulse}}$ limited by $T_{J\text{max}}$	$I_{CM}$	235	A
Power Dissipation Per IGBT $T_j = T_{j\text{max}}$ $T_h = 80^\circ\text{C}$	$P_{\text{tot}}$	117	W
Gate-emitter voltage	$V_{GE}$	$\pm 20$	V
Short Circuit Withstand Time $V_{GE} = 15\text{ V}$ , $V_{CE} = 400\text{ V}$ , $T_J \leq 150^\circ\text{C}$	$T_{sc}$	5	$\mu\text{s}$
Maximum Junction Temperature	$T_J$	175	$^\circ\text{C}$
<b>NP INVERSE DIODE (D2, D3)</b>			
Peak Repetitive Reverse Voltage	$V_{RRM}$	650	V
Forward Current, DC @ $T_h = 80^\circ\text{C}$	$I_F$	17	A
Repetitive Peak Forward Current, $T_{\text{pulse}}$ limited by $T_{J\text{max}}$	$I_{FRM}$	68	A
Power Dissipation Per Diode $T_j = T_{j\text{max}}$ $T_h = 80^\circ\text{C}$	$P_{\text{tot}}$	28	W
Maximum Junction Temperature	$T_J$	175	$^\circ\text{C}$
<b>HALFBRIDGE DIODE (D5, D8)</b>			
Peak Repetitive Reverse Voltage	$V_{RRM}$	1200	V
Forward Current, DC @ $T_h = 80^\circ\text{C}$ (per diode)	$I_F$	45	A
Repetitive Peak Forward Current, $T_{\text{pulse}}$ limited by $T_{J\text{max}}$	$I_{FRM}$	180	A
Power Dissipation Per Diode $T_j = T_{j\text{max}}$ $T_h = 80^\circ\text{C}$	$P_{\text{tot}}$	78	W
Junction Temperature	$T_J$	175	$^\circ\text{C}$

# SNXH160T120L2Q1PG

**Table 1. ABSOLUTE MAXIMUM RATINGS**

Rating	Symbol	Value	Unit
<b>THERMAL PROPERTIES</b>			
Operating Temperature under switching condition	$T_{VJ\ OP}$	-40 to ( $T_{jmax}-25$ )	°C
Storage Temperature range	$T_{stg}$	-40 to 125	°C
<b>INSULATION PROPERTIES</b>			
Isolation test voltage, t = 1 sec, 60 Hz/50 Hz	$V_{is}$	3000	$V_{RMS}$
Creepage distance		12.7	mm
Clearance		8.06	mm

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.

**Table 2. ELECTRICAL CHARACTERISTICS** ( $T_J = 25^\circ\text{C}$  unless otherwise specified)

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
<b>HALFBRIDGE IGBT INVERSE DIODE (D1, D4) CHARACTERISTICS</b>						
Forward voltage	$I_F = 7\ \text{A}, T_J = 25^\circ\text{C}$ $I_F = 7\ \text{A}, T_J = 125^\circ\text{C}$	$V_F$	-	1.46 1.49	2.7 -	V
Thermal Resistance – chip-to-heatsink	Thermal grease, Thickness = 2 Mil $\pm$ 2%, $\lambda = 1\ \text{W/mK}$	$R_{thJH}$		1.864		°C/W

**HALFBRIDGE IGBT (T1, T4) CHARACTERISTICS**

Collector-emitter saturation voltage	$V_{GE} = 15\ \text{V}, I_C = 160\ \text{A}, T_J = 25^\circ\text{C}$ $V_{GE} = 15\ \text{V}, I_C = 160\ \text{A}, T_J = 125^\circ\text{C}$	$V_{CE(sat)}$	-	2.06 2.10	2.50 -	V
Gate-emitter threshold voltage	$V_{GE} = V_{CE}, I_C = 6\ \text{mA}$	$V_{GE(TH)}$	5.0	5.80	6.50	V
Collector-emitter cutoff current	$V_{GE} = 0\ \text{V}, V_{CE} = 1200\ \text{V}$	$I_{CES}$	-	-	800	$\mu\text{A}$
Gate leakage current	$V_{GE} = 20\ \text{V}, V_{CE} = 0\ \text{V}$	$I_{GES}$	-	-	800	nA
Turn-on delay time	$T_J = 125^\circ\text{C}$ $V_{CE} = 350\ \text{V}, I_C = 100\ \text{A}$ $V_{GE} = \pm 15\ \text{V}, R_G = 4\ \Omega$	$t_{d(on)}$	-	55	-	ns
Rise time		$t_r$	-	50	-	
Turn-off delay time		$t_{d(off)}$	-	430	-	
Fall time		$t_f$	-	105	-	
Turn on switching loss			$E_{on}$	-	2.73	-
Turn off switching loss		$E_{off}$	-	3.58	-	
Input capacitance	$V_{CE} = 25\ \text{V}, V_{GE} = 0\ \text{V}, f = 10\ \text{kHz}$	$C_{ies}$	-	38164	-	pF
Output capacitance		$C_{oes}$	-	644	-	
Reverse transfer capacitance		$C_{res}$	-	784	-	
Gate charge total	$V_{CE} = 600\ \text{V}, I_C = 160\ \text{A}, V_{GE} = 15\ \text{V}$	$Q_g$	-	1664	-	nC
Thermal Resistance – chip-to-heatsink	Thermal grease, Thickness = 2 Mil $\pm$ 2%, $\lambda = 1\ \text{W/mK}$	$R_{thJH}$		0.337		°C/W

**NP DIODE (D6, D7) CHARACTERISTICS**

Forward voltage	$V_{GE} = 0\ \text{V}, I_F = 150\ \text{A}, T_J = 25^\circ\text{C}$ $V_{GE} = 0\ \text{V}, I_F = 150\ \text{A}, T_J = 125^\circ\text{C}$	$V_F$	-	2.15 2.36	2.60 -	V
Reverse leakage current	$V_{CE} = 650\ \text{V}, V_{GE} = 0\ \text{V}$	$I_r$	-	-	200	$\mu\text{A}$
Reverse recovery time	$T_J = 125^\circ\text{C}$ $V_{CE} = 350\ \text{V}, I_C = 100\ \text{A}$ $V_{GE} = \pm 15\ \text{V}, R_G = 4\ \Omega$	$t_{rr}$	-	225	-	ns
Reverse recovery charge		$Q_{rr}$	-	6.15	-	
Peak reverse recovery current		$I_{rrm}$	-	85	-	
Peak rate of fall of recovery current		$di/dt_{max}$	-	1315	-	
Reverse recovery energy		$E_{rr}$	-	1.336	-	
Thermal Resistance – chip-to-heatsink	Thermal grease, Thickness = 2 Mil $\pm$ 2%, $\lambda = 1\ \text{W/mK}$	$R_{thJH}$	-	1.07	-	°C/W

# SNXH160T120L2Q1PG

**Table 2. ELECTRICAL CHARACTERISTICS** ( $T_J = 25^\circ\text{C}$  unless otherwise specified)

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
<b>NP IGBT (T2, T3)</b>						
Collector-emitter saturation voltage	$V_{CE} = 15\text{ V}, I_C = 150\text{ A}, T_J = 25^\circ\text{C}$ $V_{CE} = 15\text{ V}, I_C = 150\text{ A}, T_J = 125^\circ\text{C}$	$V_{CE(sat)}$	– –	1.65 1.84	2.0 –	V
Gate-emitter threshold voltage	$V_{GE} = V_{CE}, I_C = 8\text{ mA}$	$V_{GE(TH)}$	5.0	6.10	6.90	V
Collector-emitter cutoff current	$V_{GE} = 0\text{ V}, V_{CE} = 650\text{ V}$	$I_{CES}$	–	–	400	$\mu\text{A}$
Gate leakage current	$V_{GE} = 20\text{ V}, V_{CE} = 0\text{ V}$	$I_{GES}$	–	–	800	nA
Turn-on delay time	$T_J = 125^\circ\text{C}$ $V_{CE} = 350\text{ V}, I_C = 100\text{ A}$ $V_{GE} = \pm 15\text{ V}, R_G = 4\ \Omega$	$t_{d(on)}$	–	46	–	ns
Rise time		$t_r$	–	48	–	
Turn-off delay time		$t_{d(off)}$	–	250	–	
Fall time		$t_f$	–	105	–	
Turn on switching loss		$E_{on}$	–	1.245	–	
Turn off switching loss	$E_{off}$	–	2.525	–		
Input capacitance	$V_{CE} = 25\text{ V}, V_{GE} = 0\text{ V}, f = 10\text{ kHz}$	$C_{ies}$	–	19380	–	pF
Output capacitance		$C_{oes}$	–	570	–	
Reverse transfer capacitance		$C_{res}$	–	496	–	
Gate charge total	$V_{CE} = 480\text{ V}, I_C = 150\text{ A}, V_{GE} = 15\text{ V}$	$Q_g$	–	790	–	nC
Thermal Resistance – chip-to-heatsink	Thermal grease, Thickness = 2 Mil $\pm$ 2%, $\lambda = 1\text{ W/mK}$	$R_{thJH}$	–	0.81	–	$^\circ\text{C/W}$
<b>NP INVERSE DIODE (D2, D3)</b>						
Forward voltage	$V_{GE} = 0\text{ V}, I_F = 15\text{ A}, T_J = 25^\circ\text{C}$ $V_{GE} = 0\text{ V}, I_F = 15\text{ A}, T_J = 125^\circ\text{C}$	$V_F$	– –	1.60 1.59	2.20 –	V
Thermal Resistance – chip-to-heatsink	Thermal grease, Thickness = 2 Mil $\pm$ 2%, $\lambda = 1\text{ W/mK}$	$R_{thJH}$		3.43		$^\circ\text{C/W}$
<b>HALFBRIDGE DIODE (D5, D8)</b>						
Forward voltage	$V_{GE} = 0\text{ V}, I_F = 150\text{ A}, T_J = 25^\circ\text{C}$ $V_{GE} = 0\text{ V}, I_F = 150\text{ A}, T_J = 125^\circ\text{C}$	$V_F$	– –	2.50 2.80	3.50 –	V
Reverse leakage current	$V_{CE} = 1200\text{ V}, V_{GE} = 0\text{ V}$	$I_r$	–	–	200	$\mu\text{A}$
Reverse recovery time	$T_J = 125^\circ\text{C}$ $V_{CE} = 350\text{ V}, I_C = 100\text{ A}$ $V_{GE} = \pm 15\text{ V}, R_G = 4\ \Omega$	$t_{rr}$	–	405	–	ns
Reverse recovery charge		$Q_{rr}$	–	15.5	–	$\mu\text{C}$
Peak reverse recovery current		$I_{rrm}$	–	220	–	A
Peak rate of fall of recovery current		$di/dt_{max}$	–	5440	–	$\text{A}/\mu\text{s}$
Reverse recovery energy		$E_{rr}$	–	5.225	–	mJ
Thermal Resistance – chip-to-heatsink	Thermal grease, Thickness = 2 Mil $\pm$ 2%, $\lambda = 1\text{ W/mK}$	$R_{thJH}$	–	1.213	–	$^\circ\text{C/W}$
<b>THERMISTOR CHARACTERISTICS</b>						
Nominal resistance		R		22		k $\Omega$
Nominal resistance	$T = 100^\circ\text{C}$	R		1468		$\Omega$
Deviation of R25		DR/R	–5		5	%
Power dissipation		$P_D$		200		mW
Power dissipation constant				2		mW/K
B-value	B(25/50), tol $\pm$ 3%				3950	K
B-value	B(25/100), tol $\pm$ 3%				3998	K
NTC reference					B	

# SNXH160T120L2Q1PG

## TYPICAL CHARACTERISTICS – HALF BRIDGE IGBT AND NEUTRAL POINT FORWARD DIODE

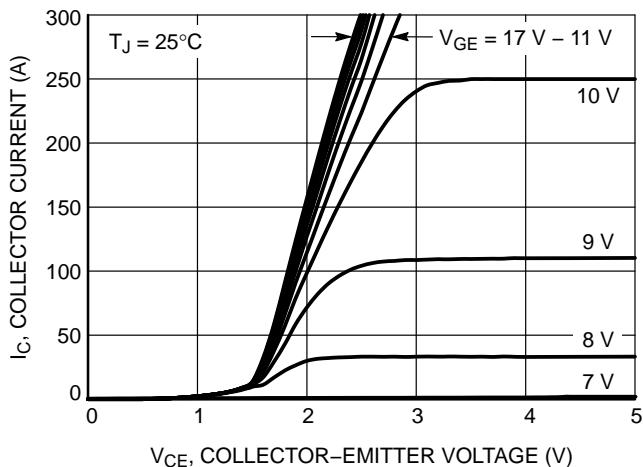


Figure 1. Typical Output Characteristics

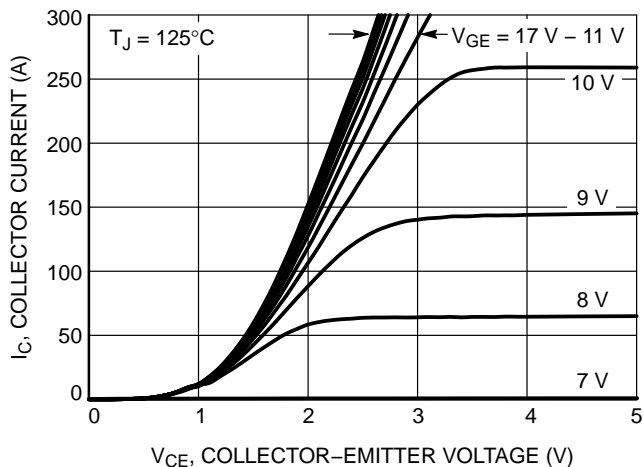


Figure 2. Typical Output Characteristics

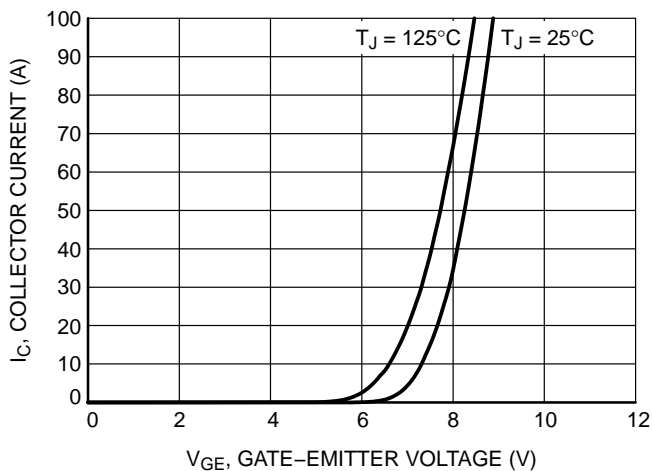


Figure 3. Typical Transfer Characteristics

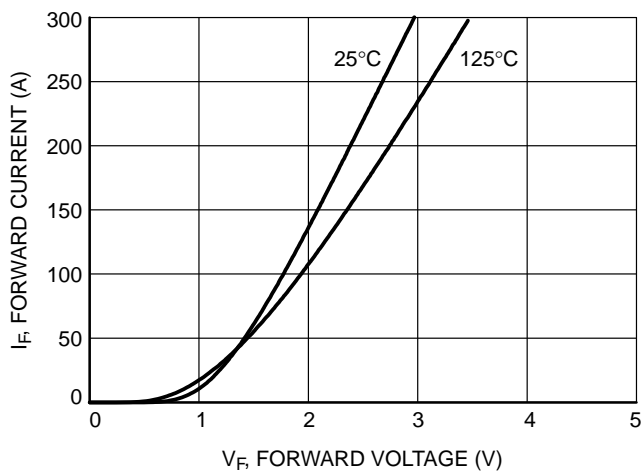


Figure 4. Diode Forward Characteristics

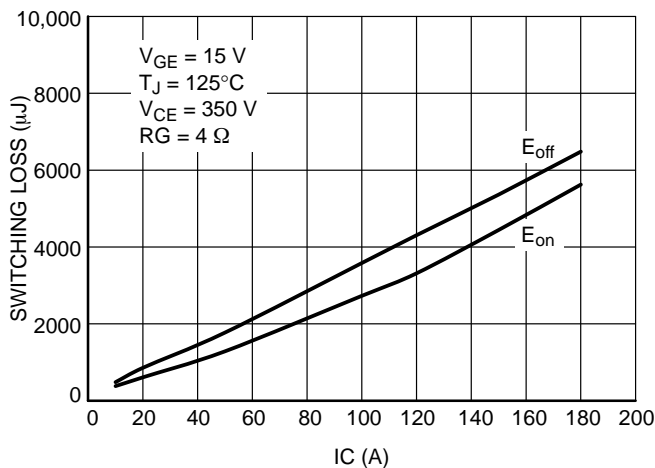


Figure 5. Typical Switching Loss vs.  $I_C$

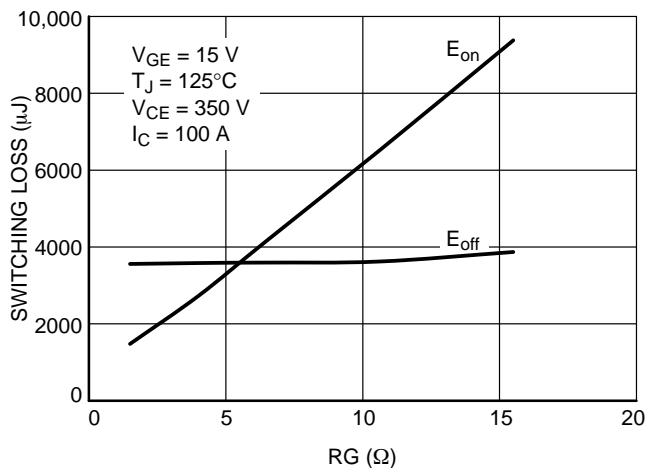


Figure 6. Typical Switching Loss vs.  $R_G$

# SNXH160T120L2Q1PG

## TYPICAL CHARACTERISTICS – HALF BRIDGE IGBT AND NEUTRAL POINT FORWARD DIODE

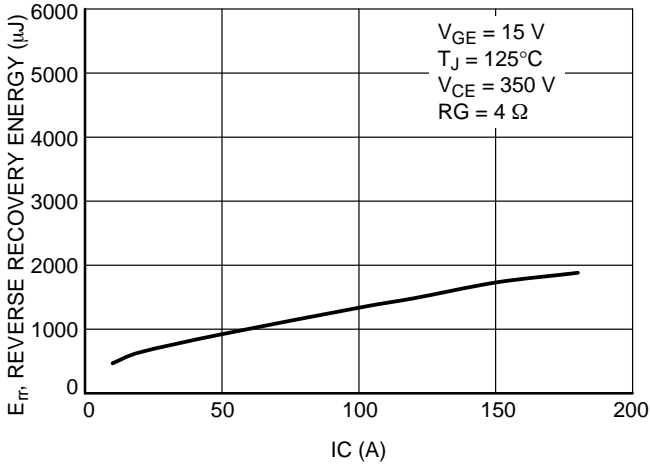


Figure 7. Typical Reverse Recovery Energy Loss vs. IC

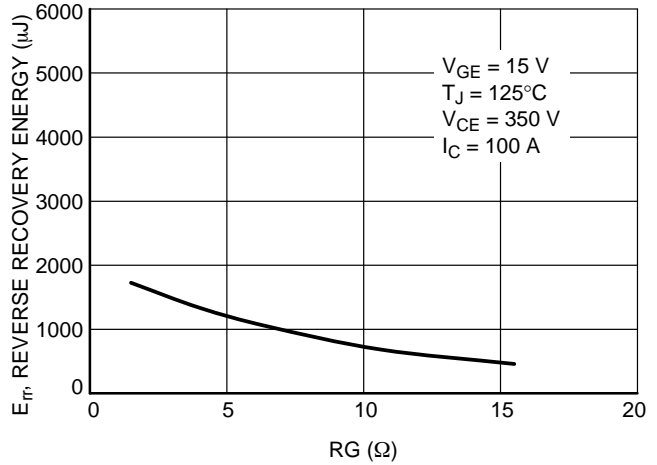


Figure 8. Typical Reverse Recovery Energy Loss vs. RG

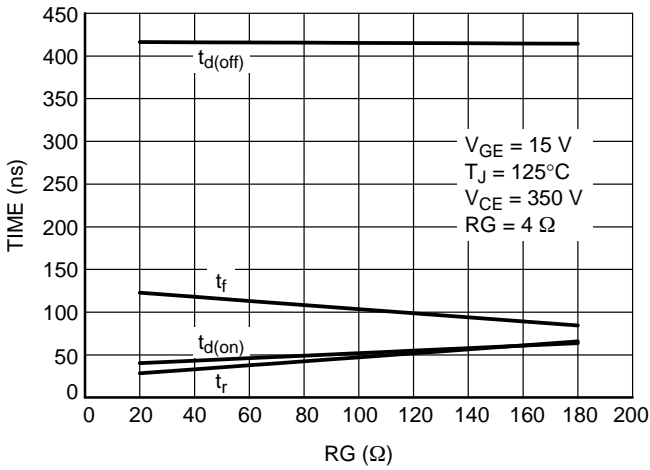


Figure 9. Typical Switching Time vs. IC

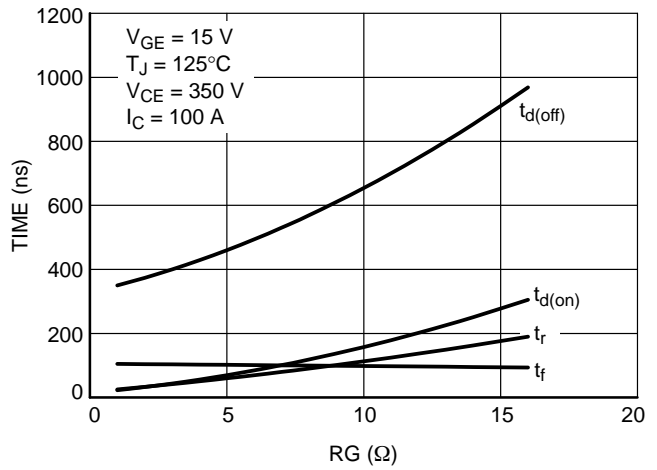


Figure 10. Typical Switching Time vs. RG

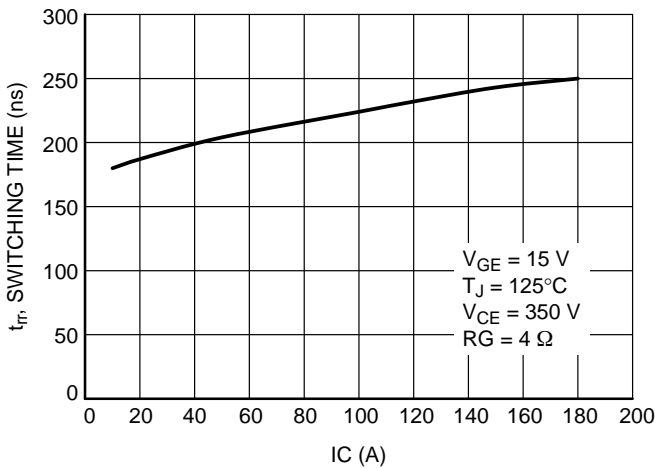


Figure 11. Typical Reverse Recovery Time vs. IC

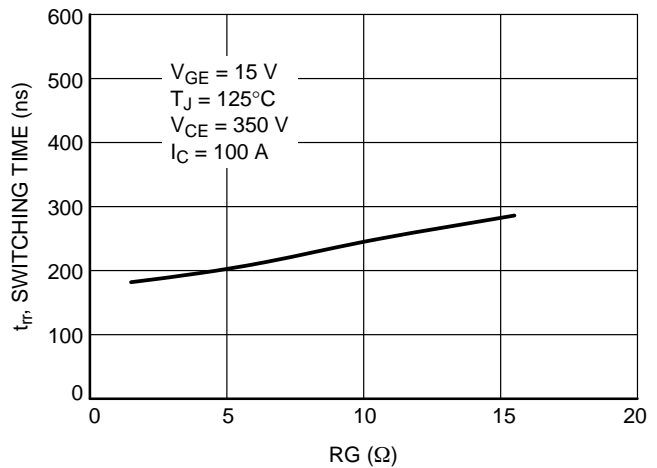


Figure 12. Typical Reverse Recovery Time vs. RG

# SNXH160T120L2Q1PG

## TYPICAL CHARACTERISTICS – HALF BRIDGE IGBT AND NEUTRAL POINT FORWARD DIODE

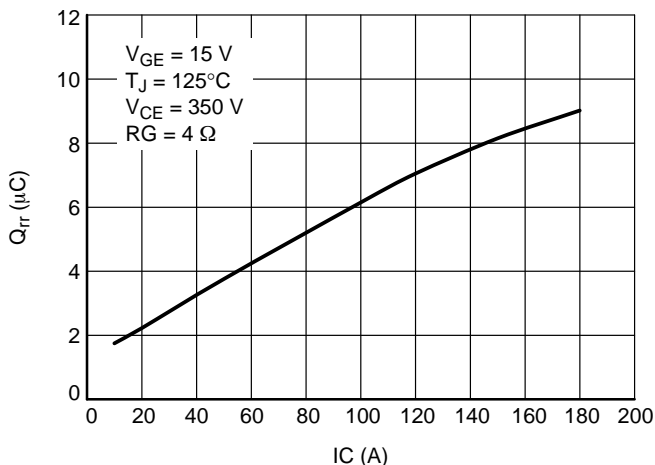


Figure 13. Typical Reverse Recovery Charge vs. IC

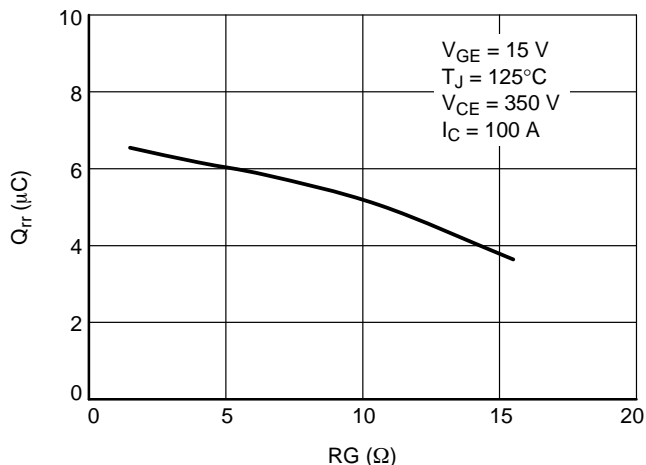


Figure 14. Typical Reverse Recovery Charge vs. RG

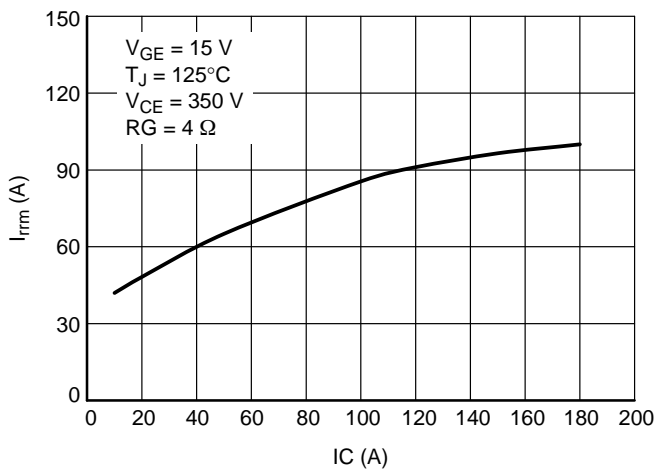


Figure 15. Typical Reverse Recovery Current vs. IC

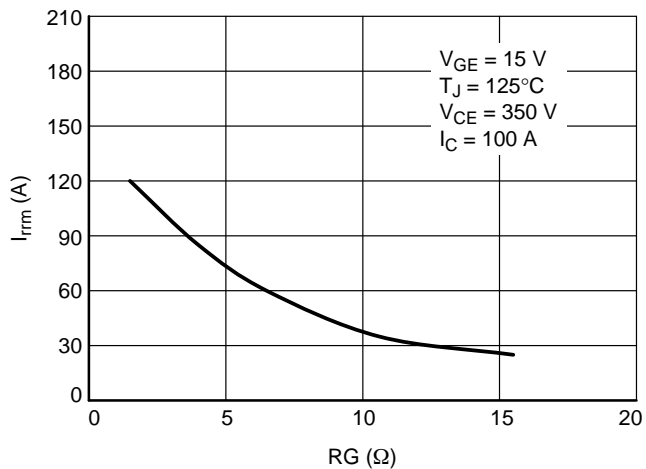


Figure 16. Typical Reverse Recovery Current vs. RG

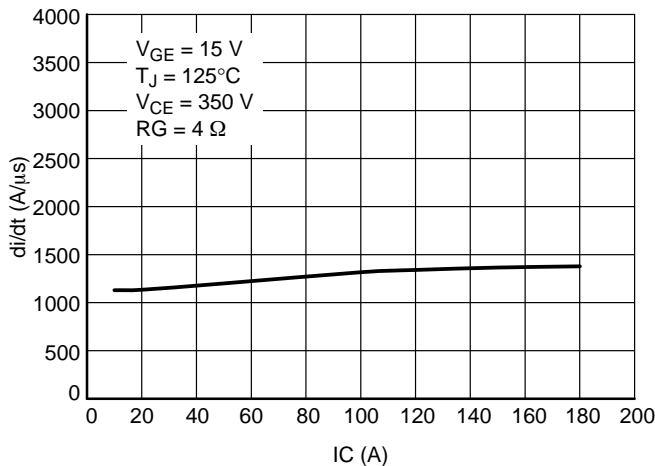


Figure 17. Typical di/dt vs. IC

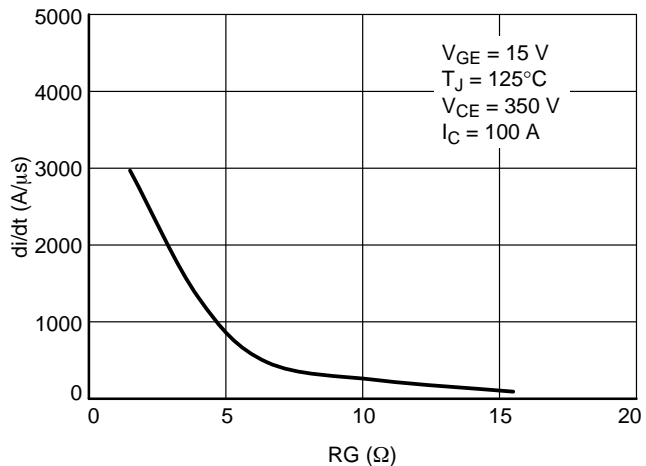


Figure 18. Typical di/dt vs. RG

# SNXH160T120L2Q1PG

## TYPICAL CHARACTERISTICS – HALF BRIDGE IGBT AND NEUTRAL POINT FORWARD DIODE

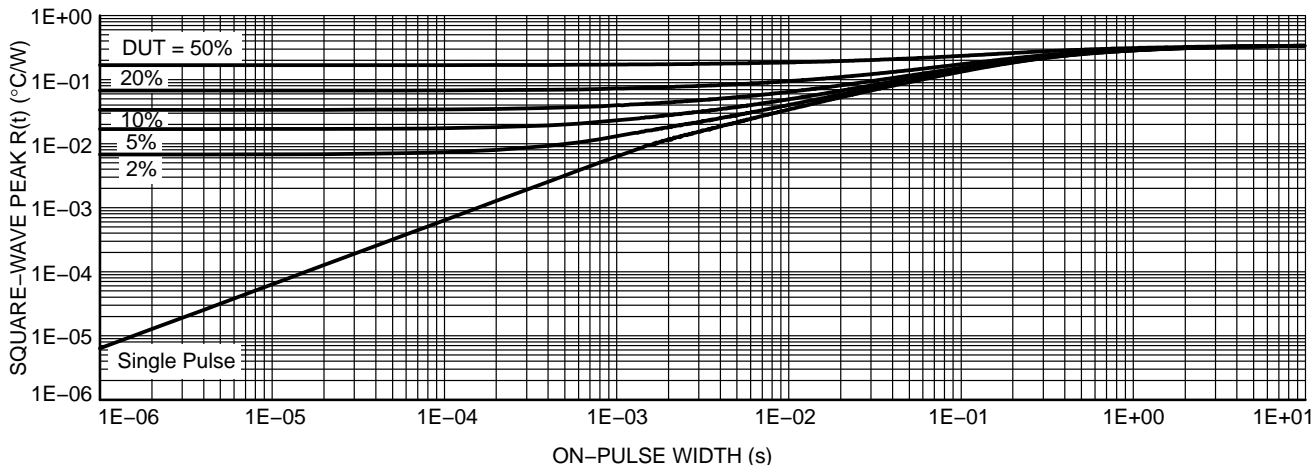


Figure 19. Transient Thermal Impedance (Half Bridge IGBT)

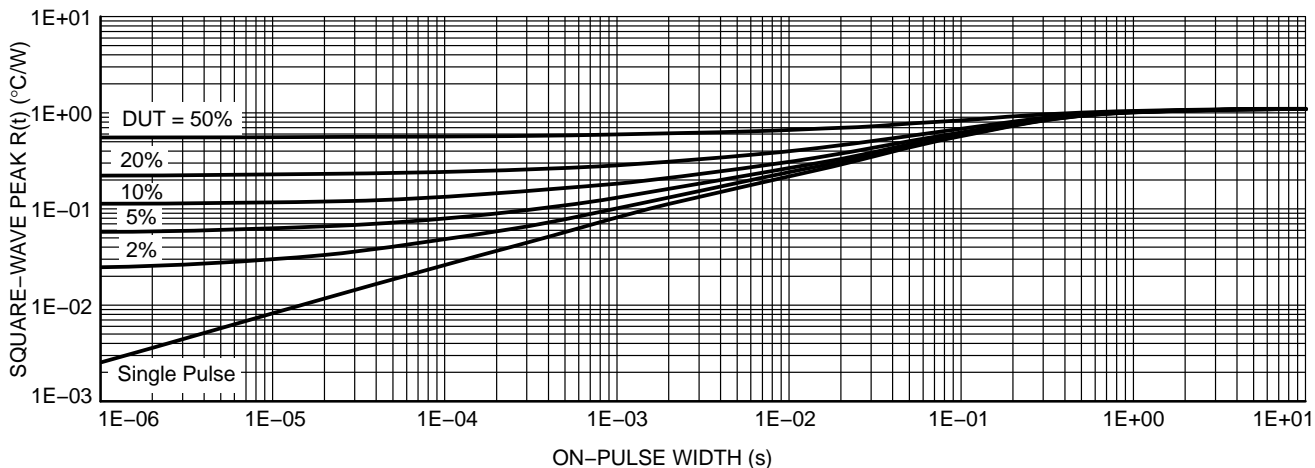


Figure 20. Transient Thermal Impedance (Neutral Point Forward Diode)

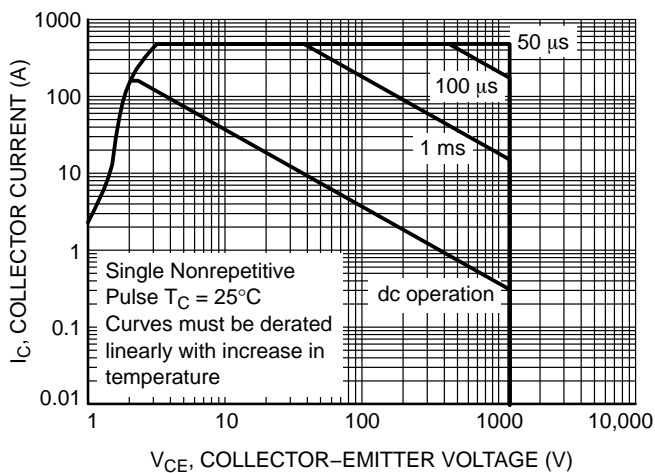


Figure 21. Safe Operating Area

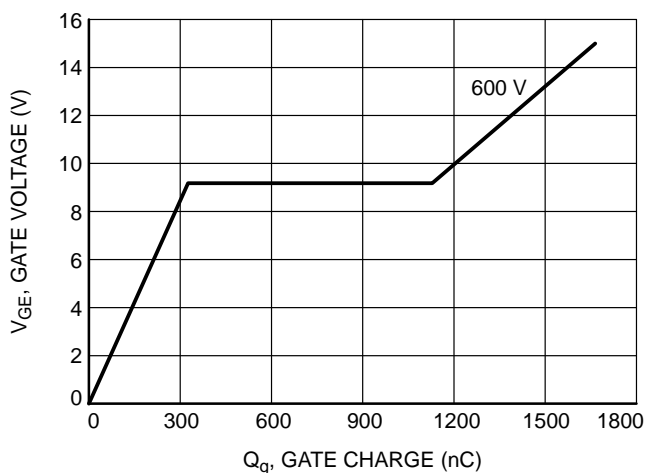


Figure 22. Gate Voltage vs. Gate Charge



# SNXH160T120L2Q1PG

## TYPICAL CHARACTERISTICS – NEUTRAL POINT IGBT AND HALF BRIDGE FORWARD DIODE

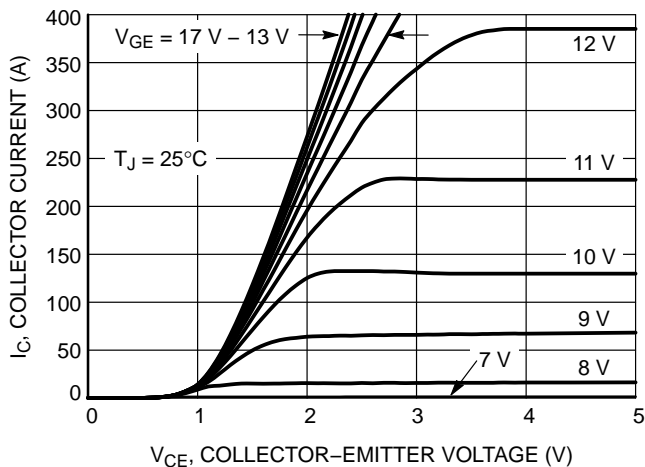


Figure 23. Typical Output Characteristics

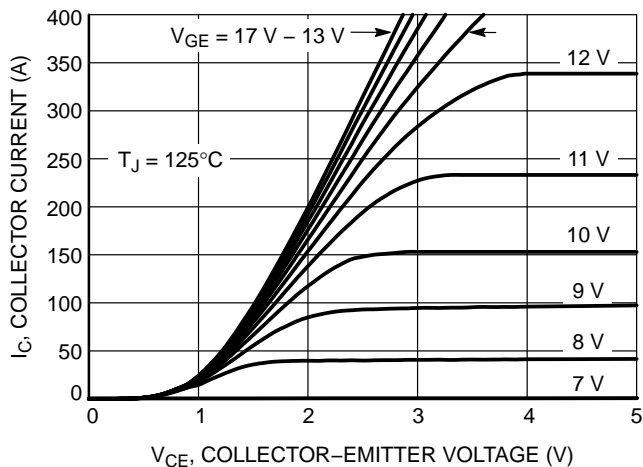


Figure 24. Typical Output Characteristics

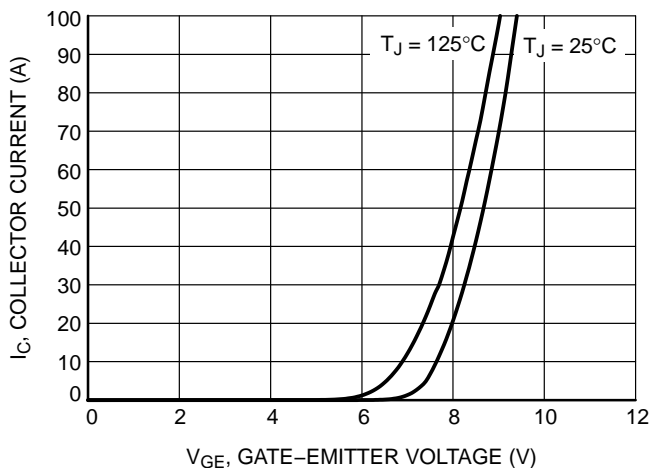


Figure 25. Typical Transfer Characteristics

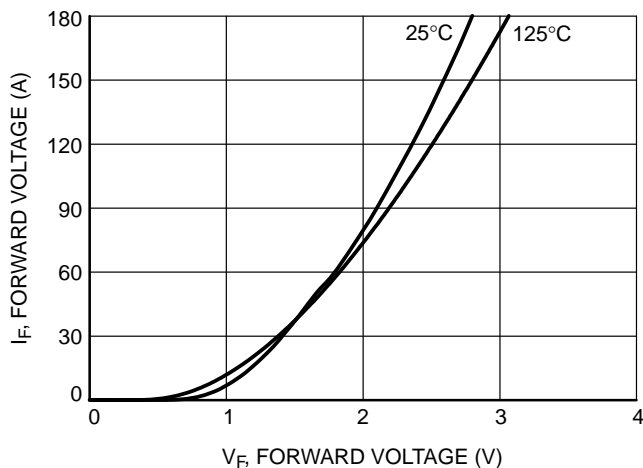


Figure 26. Diode Forward Characteristics

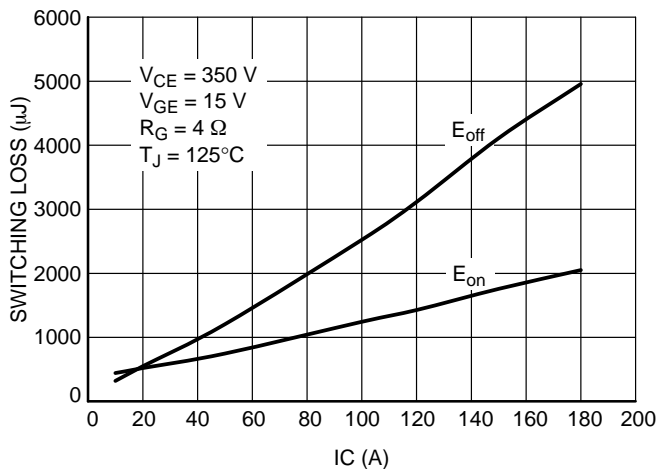


Figure 27. Typical Switching Loss vs.  $I_C$

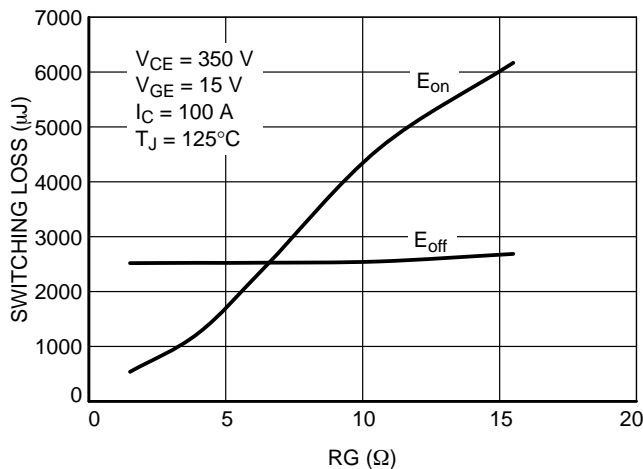


Figure 28. Typical Switching Loss vs.  $R_G$

# SNXH160T120L2Q1PG

## TYPICAL CHARACTERISTICS – NEUTRAL POINT IGBT AND HALF BRIDGE FORWARD DIODE

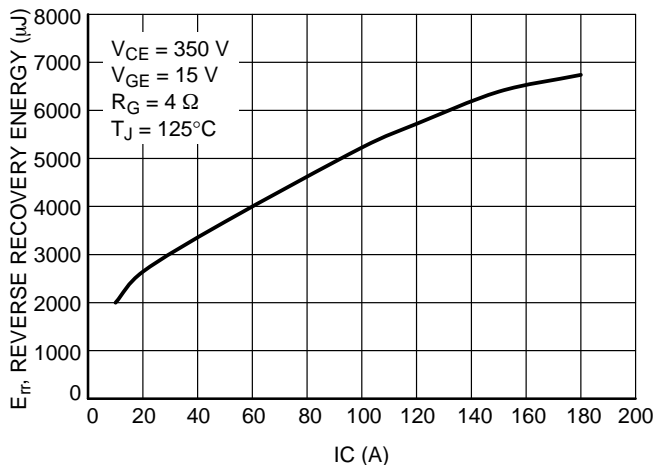


Figure 29. Typical Reverse Recovery Energy Loss vs. IC

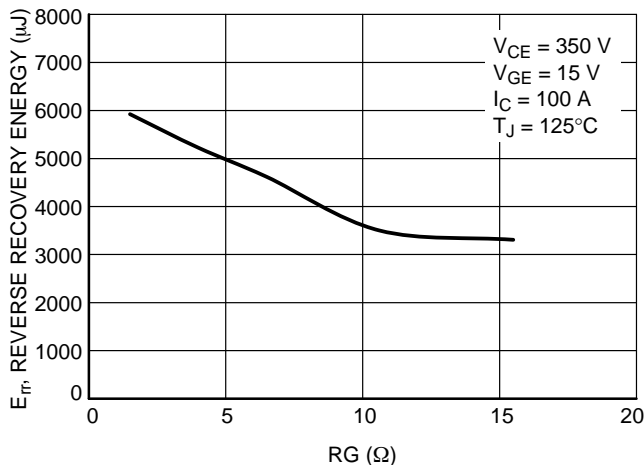


Figure 30. Typical Reverse Recovery Energy Loss vs. R<sub>G</sub>

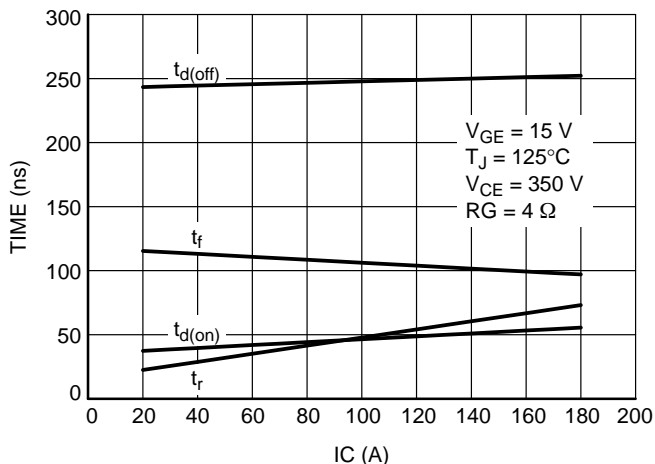


Figure 31. Typical Switching Time vs. IC

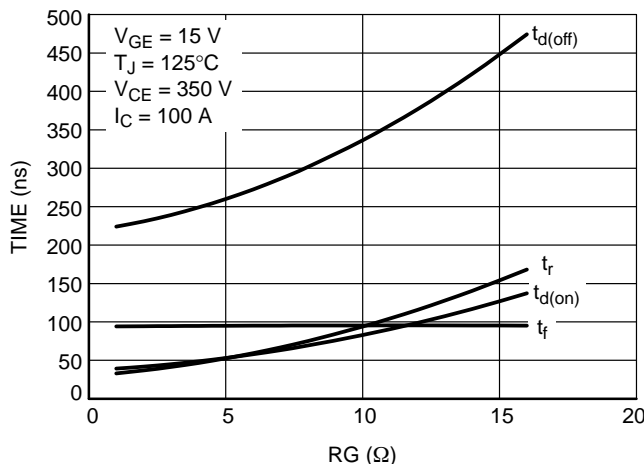


Figure 32. Typical Switching Time vs. R<sub>G</sub>

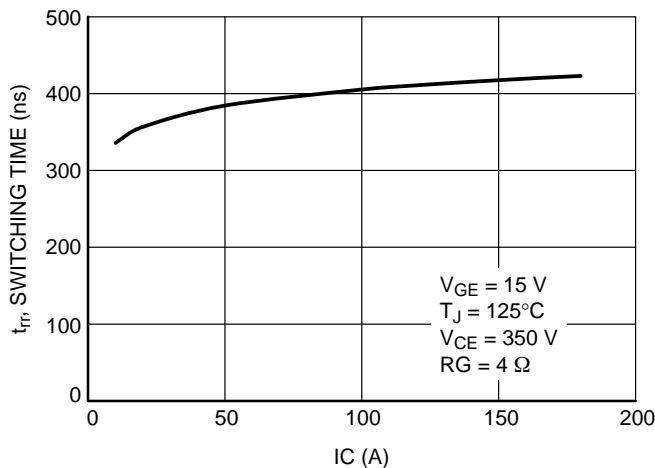


Figure 33. Half Bridge Forward Diode Typical Reverse Recovery Time vs. IC

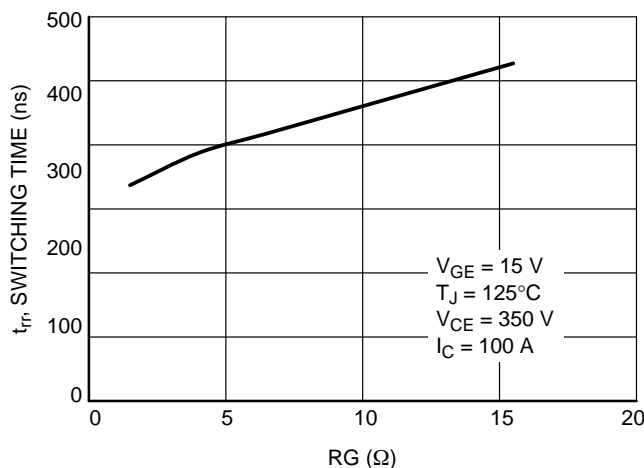


Figure 34. Half Bridge Forward Diode Typical Reverse Recovery Time vs. R<sub>G</sub>

# SNXH160T120L2Q1PG

## TYPICAL CHARACTERISTICS – NEUTRAL POINT IGBT AND HALF BRIDGE FORWARD DIODE

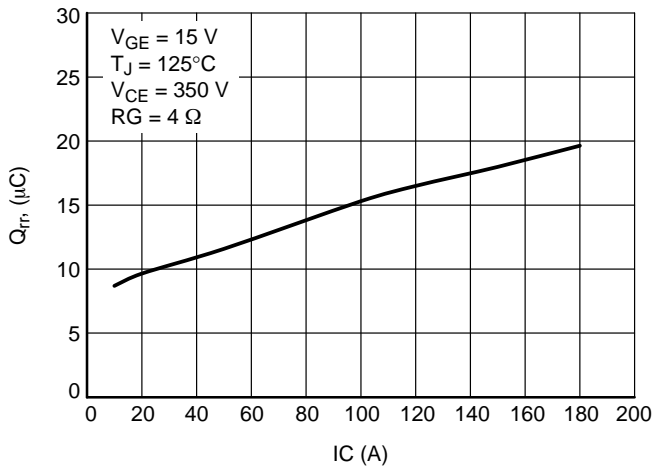


Figure 35. Half Bridge Forward Diode Typical Reverse Recovery Charge vs.  $I_C$

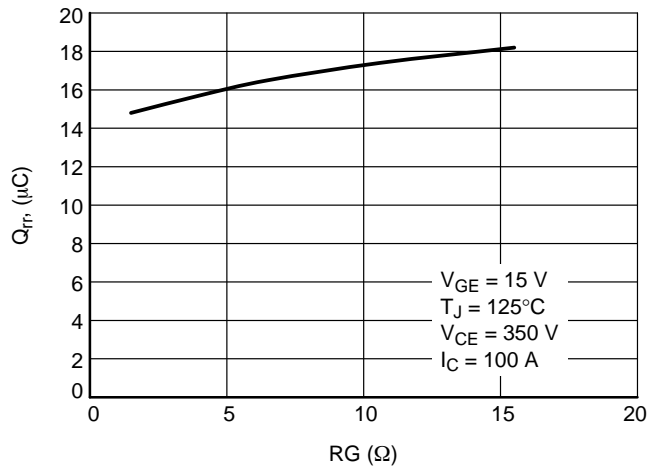


Figure 36. Half Bridge Forward Diode Typical Reverse Recovery Charge vs.  $R_G$

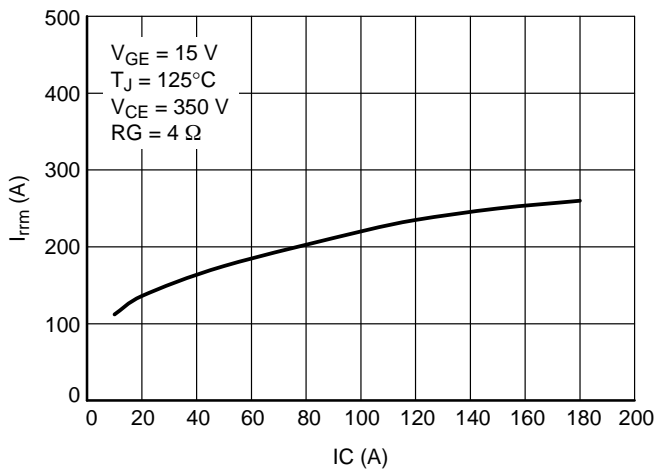


Figure 37. Typical Reverse Recovery Current vs.  $I_C$

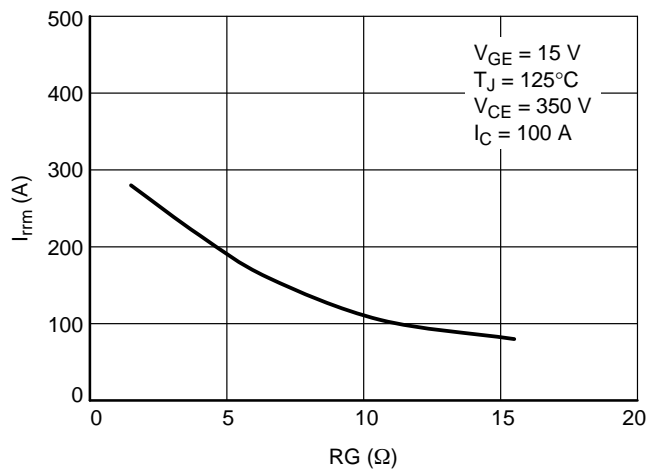


Figure 38. Typical Reverse Recovery Current vs.  $R_G$

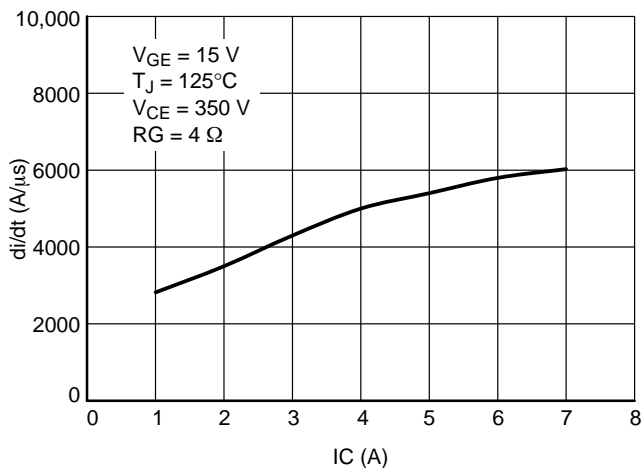


Figure 39. Typical  $di/dt$  vs.  $I_C$

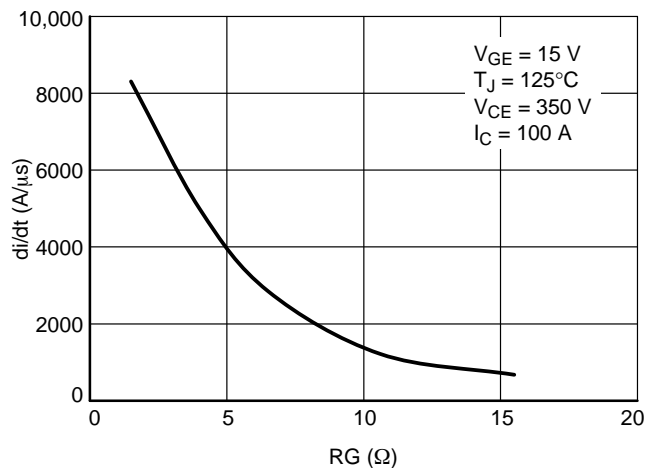


Figure 40. Typical  $di/dt$  vs.  $R_G$

# SNXH160T120L2Q1PG

## TYPICAL CHARACTERISTICS – NEUTRAL POINT IGBT AND HALF BRIDGE FORWARD DIODE

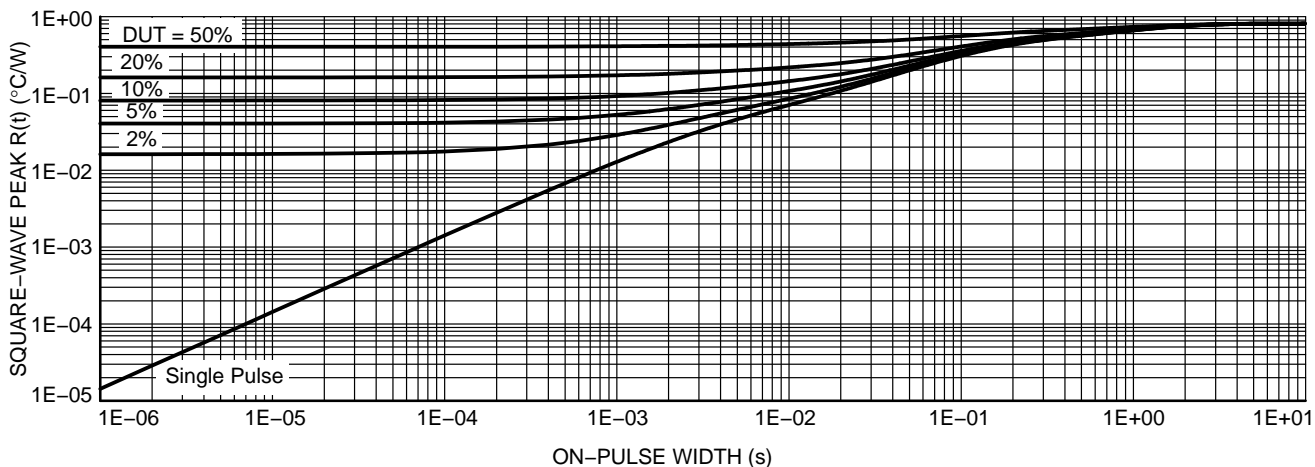


Figure 41. Transient Thermal Impedance (Neutral Point IGBT)

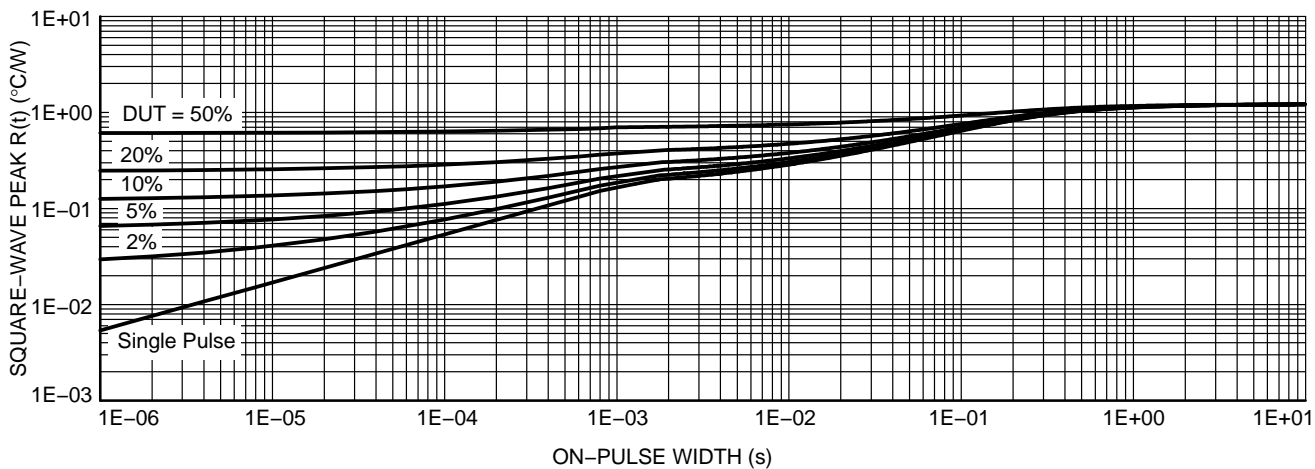


Figure 42. Transient Thermal Impedance (Half Bridge Forward Diode)

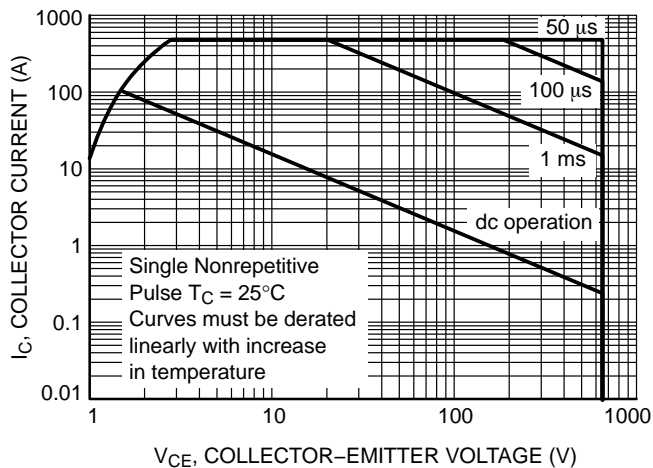


Figure 43. Safe Operating Area

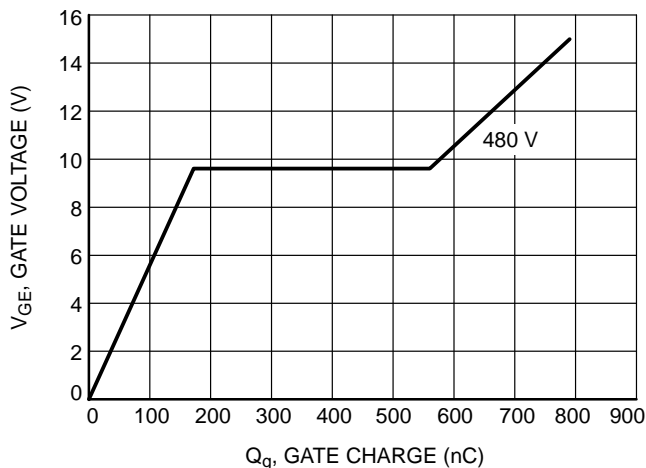


Figure 44. Gate Voltage vs. Gate Charge

# SNXH160T120L2Q1PG

## TYPICAL CHARACTERISTICS – HALF BRIDGE INVERSE DIODE

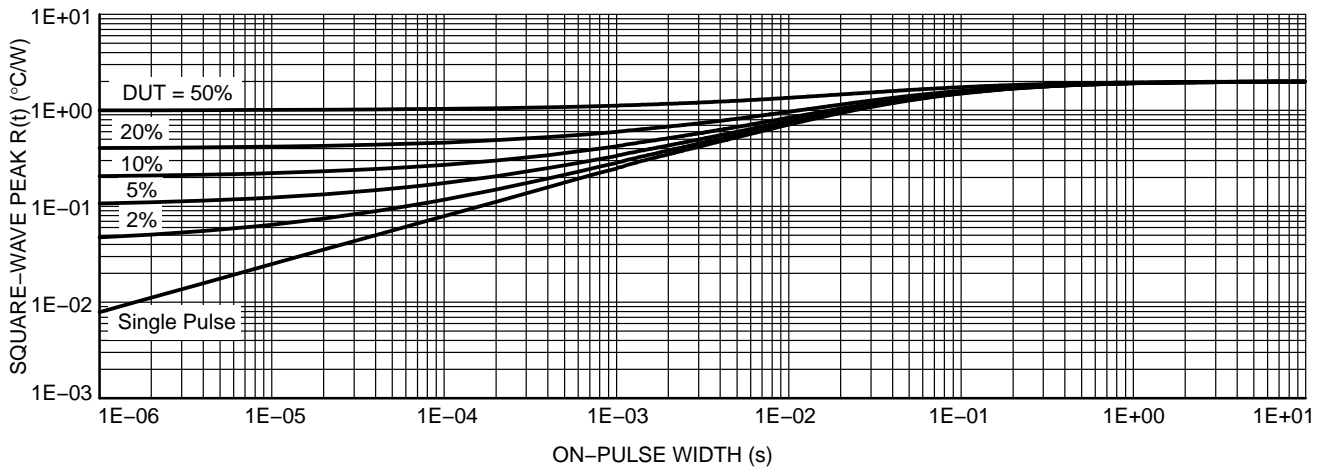


Figure 45. Transient Thermal Impedance

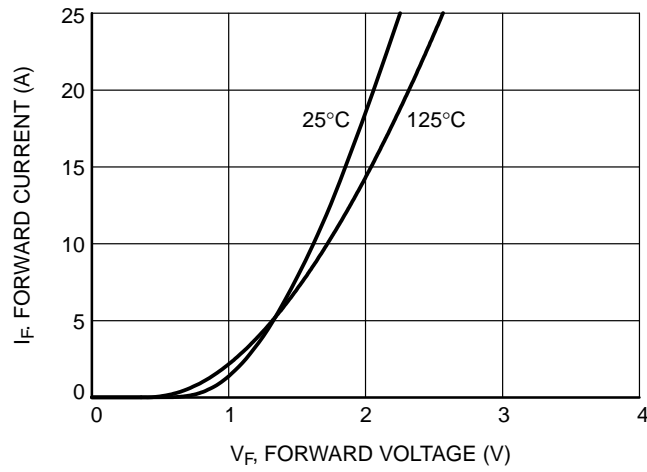


Figure 46. Diode Forward Characteristics

# SNXH160T120L2Q1PG

## TYPICAL CHARACTERISTICS – NEUTRAL POINT INVERSE DIODE

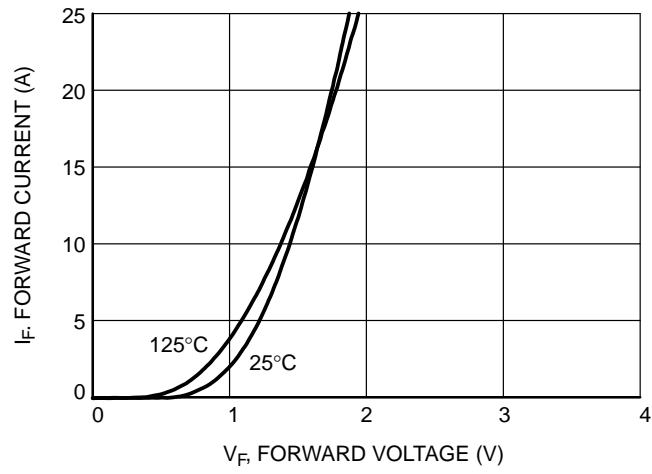


Figure 47. Diode Forward Characteristics

# SNXH160T120L2Q1PG

## TYPICAL CHARACTERISTICS – THERMISTOR

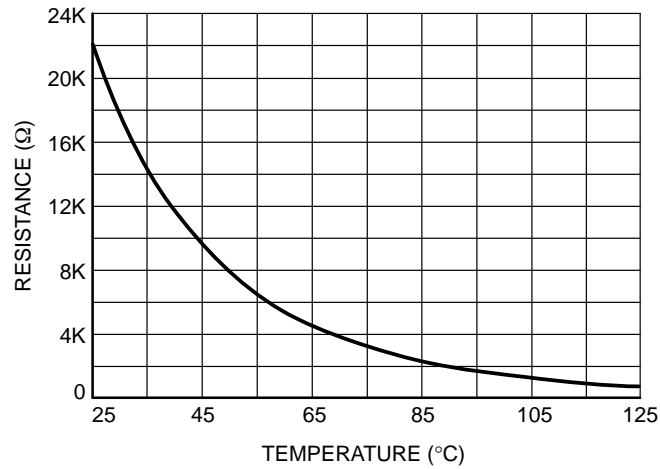


Figure 48. Thermistor Characteristics

### ORDERING INFORMATION

Orderable Part Number	Package	Shipping
SNXH160T120L2Q1PG (Solder Pin)	Q1PACK – Case 180AD (Pb-Free and Halide-Free)	21 Units / Blister Tray

# SNXH160T120L2Q1PG

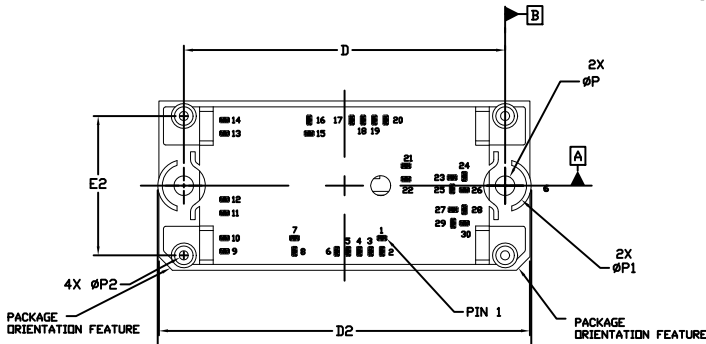
## PACKAGE DIMENSIONS

PIM30 71x37.4  
CASE 180AD  
ISSUE A

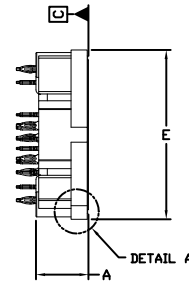
NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2009.
2. CONTROLLING DIMENSION: MILLIMETERS
3. DIMENSIONS b AND b1 APPLY TO THE PLATED TERMINALS AND ARE MEASURED AT DIMENSION A4.
4. POSITION OF THE CENTER OF THE TERMINALS IS DETERMINED FROM DATUM B THE CENTER OF DIMENSION D, X DIRECTION, AND FROM DATUM A, Y DIRECTION. POSITIONAL TOLERANCE, AS NOTED IN DRAWING, APPLIES TO EACH TERMINAL IN BOTH DIRECTIONS.
5. PACKAGE MARKING IS LOCATED AS SHOWN ON THE SIDE OPPOSITE THE PACKAGE ORIENTATION FEATURES.

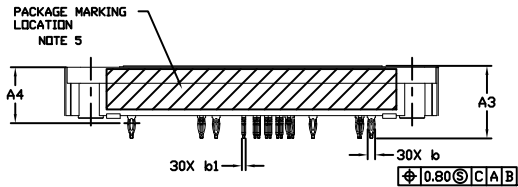
DIM	MILLIMETERS	
	MIN.	NDM.
A	11.40	11.60
A3	15.50	16.50
A4	12.35 BSC	
A5	0.15	0.45
b	1.61	1.71
b1	0.75	0.85
D	70.50	71.50
D1	82.00	83.00
D2	81.50	82.50
E	36.90	37.90
E2	30.30	31.30
P	4.30	4.50
P1	9.30	9.70
P2	1.80	2.20



TOP VIEW



END VIEW

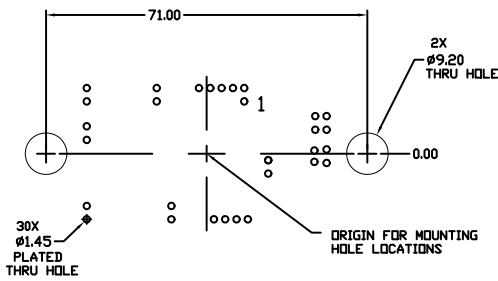


SIDE VIEW

NOTE 4

NOTE 4

PIN	PIN POSITION		PIN	PIN POSITION	
	X	Y		X	Y
1	8.30	-11.55	16	-7.800	14.50
2	8.30	-14.50	17	1.60	14.50
3	5.80	-14.50	18	4.10	14.50
4	3.30	-14.50	19	6.60	14.50
5	0.80	-14.50	20	9.10	14.50
6	-1.70	-14.50	21	13.60	4.40
7	-11.05	-11.55	22	13.60	1.45
8	-11.05	-14.50	23	23.80	1.80
9	-26.50	-14.50	24	26.50	2.05
10	-26.50	-11.55	25	23.80	-0.70
11	-26.50	-6.05	26	26.50	-0.95
12	-26.50	-3.05	27	24.00	-5.30
13	-26.50	11.55	28	26.50	-5.30
14	-26.50	14.50	29	24.00	-8.30
15	-7.80	14.50	30	26.50	-8.30




RECOMMENDED MOUNTING PATTERN

MOUNTING HOLE POSITION			MOUNTING HOLE POSITION		
PIN	X	Y	PIN	X	Y
1	8.30	11.55	16	-7.800	-14.50
2	8.30	14.50	17	1.60	-14.50
3	5.80	14.50	18	4.10	-14.50
4	3.30	14.50	19	6.60	-14.50
5	0.80	14.50	20	9.10	-14.50
6	-1.70	14.50	21	13.60	-4.40
7	-11.05	11.55	22	13.60	-1.45
8	-11.05	14.50	23	23.80	-1.80
9	-26.50	14.50	24	26.50	-2.05
10	-26.50	11.55	25	23.80	0.70
11	-26.50	6.05	26	26.50	0.95
12	-26.50	3.05	27	24.00	5.30
13	-26.50	-11.55	28	26.50	5.30
14	-26.50	-14.50	29	24.00	8.30
15	-7.80	-14.50	30	26.50	8.30



# SNXH160T120L2Q1PG

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