NXH160T120L2Q2F2SG

Split T-Type NPC Power Module

1200 V, 160 A IGBT, 600 V, 100 A IGBT

The NXH160T120L2Q2F2SG is a power module containing a split T− type neutral point clamped three−level inverter, consisting of two 160 A / 1200 V Half Bridge IGBTs with inverse diodes, two Neutral Point 120 A / 600 V rectifiers, two 100 A / 600 V Neutral Point IGBTs with inverse diodes, two Half Bridge 60 A / 1200 V rectifiers and a negative temperature coefficient thermistor (NTC).

Features

- Split T−type Neutral Point Clamped Three−level Inverter Module
- 1200 V IGBT Specifications: $V_{CE(SAT)}$ = 2.15 V, E_{SW} = 4300 μJ
- 600 V IGBT specifications: $V_{CE(SAT)}$ = 1.47 V, E_{SW} = 2560 μJ
- Baseplate
- Solderable Pins
- Thermistor

Typical Applications

- Solar Inverters
- Uninterruptible Power Supplies

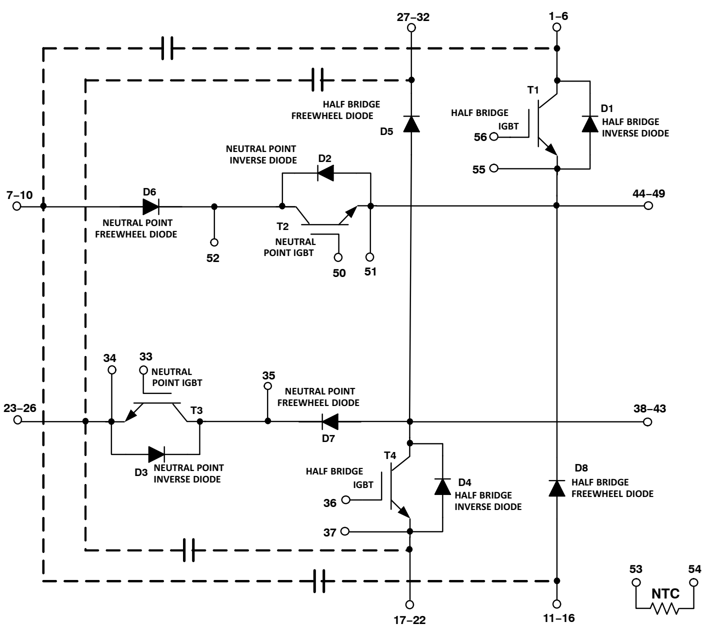
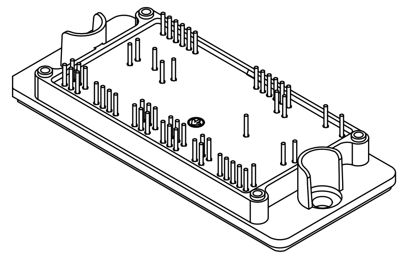


Figure 1. NXH160T120L2Q2F2SG Schematic Diagram

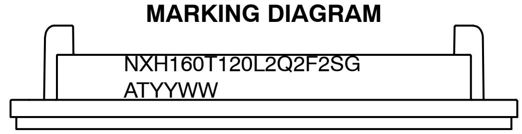
ON Semiconductor®

www.onsemi.com



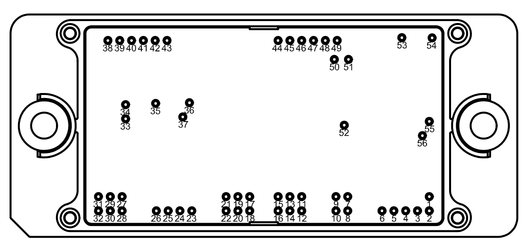
Q2PACK
CASE 180AK

MARKING DIAGRAM



NXH160T120L2Q2F2SG = Device Code
YYWW = Year and Work Week Code
A = Assembly Site Code
T = Test Site Code
G = Pb−Free Package

PIN CONNECTIONS



ORDERING INFORMATION

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

May, 2019 − Rev. 1

Publication Order Number:
NXH160T120L2Q2/D

Table 1. ABSOLUTE MAXIMUM RATINGS (Note 1) T_J = 25°C unless otherwise noted

Rating	Symbol	Value	Unit
HALF BRIDGE IGBT			
Collector−Emitter Voltage	V_{CES}	1200	V
Gate−Emitter Voltage	V_{GE}	±20	V
Continuous Collector Current @ T_h = 80°C (T_J = 175°C)	I_C	181	A
Pulsed Collector Current (T_J = 175°C)	I_{Cpulse}	543	A
Maximum Power Dissipation @ T_h = 80°C (T_J = 175°C)	P_{tot}	500	W
Short Circuit Withstand Time @ V_{GE} = 15 V, V_{CE} = 600 V, $T_J \leq$ 150°C	T_{sc}	5	μs
Minimum Operating Junction Temperature	T_{JMIN}	−40	°C
Maximum Operating Junction Temperature	T_{JMAX}	150	°C
NEUTRAL POINT IGBT			
Collector−Emitter Voltage	V_{CES}	600	V
Gate−Emitter Voltage	V_{GE}	±20	V
Continuous Collector Current @ T_h = 80°C (T_J = 175°C)	I_C	116	A
Pulsed Collector Current (T_J = 175°C)	I_{Cpulse}	348	A
Maximum Power Dissipation @ T_h = 80°C (T_J = 175°C)	P_{tot}	232	W
Short Circuit Withstand Time @ V_{GE} = 15 V, V_{CE} = 400 V, $T_J \leq$ 150°C	T_{sc}	5	μs
Minimum Operating Junction Temperature	T_{JMIN}	−40	°C
Maximum Operating Junction Temperature	T_{JMAX}	150	°C
HALF BRIDGE FREEWHEEL DIODE			
Peak Repetitive Reverse Voltage	V_{RRM}	1200	V
Continuous Forward Current @ T_h = 80°C (T_J = 175°C)	I_F	56	A
Repetitive Peak Forward Current (T_J = 175°C, t_p limited by T_{Jmax})	I_{FRM}	150	A
Maximum Power Dissipation @ T_h = 80°C (T_J = 175°C)	P_{tot}	142	W
Minimum Operating Junction Temperature	T_{JMIN}	−40	°C
Maximum Operating Junction Temperature	T_{JMAX}	150	°C
HALF BRIDGE INVERSE DIODE			
Peak Repetitive Reverse Voltage	V_{RRM}	1200	V
Continuous Forward Current @ T_h = 80°C (T_J = 175°C)	I_F	19	A
Repetitive Peak Forward Current (T_J = 175°C, t_p limited by T_{Jmax})	I_{FRM}	50	A
Maximum Power Dissipation @ T_h = 80°C (T_J = 175°C)	P_{tot}	63	W
Minimum Operating Junction Temperature	T_{JMIN}	−40	°C
Maximum Operating Junction Temperature	T_{JMAX}	150	°C
NEUTRAL POINT FREEWHEEL DIODE			
Peak Repetitive Reverse Voltage	V_{RRM}	600	V
Continuous Forward Current @ T_h = 80°C (T_J = 175°C)	I_F	132	A
Repetitive Peak Forward Current (T_J = 175°C, t_p limited by T_{Jmax})	I_{FRM}	300	A
Maximum Power Dissipation @ T_h = 80°C (T_J = 175°C)	P_{tot}	198	W
Minimum Operating Junction Temperature	T_{JMIN}	−40	°C
Maximum Operating Junction Temperature	T_{JMAX}	150	°C
NEUTRAL POINT INVERSE DIODE			
Peak Repetitive Reverse Voltage	V_{RRM}	600	V
Continuous Forward Current @ T_h = 80°C (T_J = 175°C)	I_F	38	A
Repetitive Peak Forward Current (T_J = 175°C, t_p limited by T_{Jmax})	I_{FRM}	110	A
Maximum Power Dissipation @ T_h = 80°C (T_J = 175°C)	P_{tot}	79	W
Minimum Operating Junction Temperature	T_{JMIN}	−40	°C

Table 1. ABSOLUTE MAXIMUM RATINGS (Note 1) T_J = 25°C unless otherwise noted

Rating	Symbol	Value	Unit
NEUTRAL POINT INVERSE DIODE			
Maximum Operating Junction Temperature	T_{JMAX}	150	°C
THERMAL PROPERTIES			
Storage Temperature range	T_{stg}	−40 to 125	°C
INSULATION PROPERTIES			
Isolation test voltage, t = 1 sec, 60Hz	V_{is}	3000	V_{RMS}
Creepage distance		12.7	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.

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

Table 2. RECOMMENDED OPERATING RANGES

Rating	Symbol	Min	Max	Unit
Module Operating Junction Temperature	T_J	−40	(T_{jmax} −25)	°C

Functional operation above the stresses listed in the Recommended Operating Ranges is not implied. Extended exposure to stresses beyond the Recommended Operating Ranges limits may affect device reliability.

Table 3. ELECTRICAL CHARACTERISTICS T_J = 25°C unless otherwise noted

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
HALF BRIDGE IGBT CHARACTERISTICS						
Collector−Emitter Cutoff Current	V_{GE} = 0 V, V_{CE} = 1200 V	I_{CES}	–	–	500	µA
Collector−Emitter Saturation Voltage	V_{GE} = 15 V, I_C = 160 A, T_J = 25°C	$V_{CE(sat)}$	–	2.15	2.7	V
	V_{GE} = 15 V, I_C = 160 A, T_J = 150°C		–	2.08	–	
Gate−Emitter Threshold Voltage	V_{GE} = V_{CE}, I_C = 6 mA	$V_{GE(TH)}$	–	5.53	6.4	V
Gate Leakage Current	V_{GE} = 20 V, V_{CE} = 0 V	I_{GES}	–	–	500	nA
Turn−on Delay Time	T_J = 25°C V_{CE} = 350 V, I_C = 100 A V_{GE} = ±15 V, R_G = 4 Ω	$t_{d(on)}$	–	105	–	ns
Rise Time		t_r	–	50	–	
Turn−off Delay Time		$t_{d(off)}$	–	270	–	
Fall Time		t_f	–	55	–	
Turn−on Switching Loss per Pulse		E_{on}	–	1700	–	µJ
Turn off Switching Loss per Pulse		E_{off}	–	2600	–	
Turn−on Delay Time	T_J = 125°C V_{CE} = 350 V, I_C = 100 A V_{GE} = ±15 V, R_G = 4 Ω	$t_{d(on)}$	–	95	–	ns
Rise Time		t_r	–	55	–	
Turn−off Delay Time		$t_{d(off)}$	–	285	–	
Fall Time		t_f	–	150	–	
Turn−on Switching Loss per Pulse		E_{on}	–	2300	–	µJ
Turn off Switching Loss per Pulse		E_{off}	–	4600	–	
Input Capacitance	V_{CE} = 25 V. V_{GE} = 0 V. f = 10 kHz	C_{ies}	–	38800	–	pF
Output Capacitance		C_{oes}	–	800	–	
Reverse Transfer Capacitance		C_{res}	–	680	–	
Total Gate Charge	V_{CE} = 600 V, I_C = 160 A, V_{GE} = 15 V	Q_g	–	1600	–	nC
Thermal Resistance – chip−to−heatsink	Thermal grease, Thickness < 100 µm, λ = 0.84 W/mK	R_{thJH}	–	0.19	–	°C/W

Table 3. ELECTRICAL CHARACTERISTICS T_J = 25°C unless otherwise noted

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
NEUTRAL POINT FREEWHEEL DIODE CHARACTERISTICS						
Diode Reverse Leakage Current	V_R = 600 V	I_R	–	–	100	μA
Diode Forward Voltage	I_F = 120 A, T_J = 25°C	V_F	–	1.24	1.5	V
	I_F = 120 A, T_J = 150°C		–	1.20	–	
Reverse Recovery Time	T_J = 25°C V_{CE} = 350 V, I_C = 100 A V_{GE} = ±15 V, R_G = 4 Ω	t_{rr}	–	50	–	ns
Reverse Recovery Charge		Q_{rr}	–	1700	–	nC
Peak Reverse Recovery Current		I_{RRM}	–	59	–	A
Peak Rate of Fall of Recovery Current		di/dt	–	2500	–	A/μs
Reverse Recovery Energy		E_{rr}	–	380	–	μJ
Reverse Recovery Time	T_J = 125°C V_{CE} = 350 V, I_C = 100 A V_{GE} = ±15 V, R_G = 4 Ω	t_{rr}	–	77	–	ns
Reverse Recovery Charge		Q_{rr}	–	3600	–	nC
Peak Reverse Recovery Current		I_{RRM}	–	77	–	A
Peak Rate of Fall of Recovery Current		di/dt	–	1900	–	A/μs
Reverse Recovery Energy		E_{rr}	–	780	–	μJ
Thermal Resistance – chip–to–heatsink	Thermal grease, Thickness < 100 μm, λ = 0.84 W/mK	R_{thJH}	–	0.48	–	°C/W
NEUTRAL POINT IGBT CHARACTERISTICS						
Collector–Emitter Cutoff Current	V_{GE} = 0 V, V_{CE} = 600 V	I_{CES}	–	–	300	μA
Collector–Emitter Saturation Voltage	V_{GE} = 15 V, I_C = 100 A, T_J = 25°C	$V_{CE(sat)}$	–	1.47	1.8	V
	V_{GE} = 15 V, I_C = 100 A, T_J = 150°C		–	1.50	–	
Gate–Emitter Threshold Voltage	V_{GE} = V_{CE}, I_C = 1.2 mA	$V_{GE(TH)}$	–	5.30	6.4	V
Gate Leakage Current	V_{GE} = 20 V, V_{CE} = 0 V	I_{GES}	–	–	300	nA
Turn–on Delay Time	T_J = 25°C V_{CE} = 350 V, I_C = 100 A V_{GE} = ±15 V, R_G = 4 Ω	$t_{d(on)}$	–	50	–	ns
Rise Time		t_r	–	35	–	
Turn–off Delay Time		$t_{d(off)}$	–	135	–	
Fall Time		t_f	–	40	–	
Turn–on Switching Loss per Pulse		E_{on}	–	870	–	μJ
Turn off Switching Loss per Pulse		E_{off}	–	1690	–	
Turn–on Delay Time	T_J = 125°C V_{CE} = 350 V, I_C = 100 A V_{GE} = ±15 V, R_G = 4 Ω	$t_{d(on)}$	–	50	–	ns
Rise Time		t_r	–	37	–	
Turn–off Delay Time		$t_{d(off)}$	–	145	–	
Fall Time		t_f	–	65	–	
Turn–on Switching Loss per Pulse		E_{on}	–	1300	–	μJ
Turn off Switching Loss per Pulse		E_{off}	–	2500	–	
Input Capacitance	V_{CE} = 25 V, V_{GE} = 0 V, f = 10 kHz	C_{ies}	–	18800	–	pF
Output Capacitance		C_{oes}	–	560	–	
Reverse Transfer Capacitance		C_{res}	–	500	–	
Total Gate Charge	V_{CE} = 480 V, I_C = 80 A, V_{GE} = 15 V	Q_g	–	790	–	nC
Thermal Resistance – chip–to–heatsink	Thermal grease, Thickness < 100 μm, λ = 0.84 W/mK	R_{thJH}	–	0.41	–	°C/W

Table 3. ELECTRICAL CHARACTERISTICS T_J = 25°C unless otherwise noted

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
HALF BRIDGE FREEWHEEL DIODE CHARACTERISTICS						
Diode Reverse Leakage Current	V_R = 1200 V	I_R	–	–	100	µA
Diode Forward Voltage	I_F = 60 A, T_J = 25°C	V_F	–	2.63	3.3	V
	I_F = 60 A, T_J = 150°C		–	2.12	–	
Reverse Recovery Time	T_J = 25°C V_{CE} = 350 V, I_C = 100 A V_{GE} = ±15 V, R_G = 4 Ω	t_{rr}	–	320	–	ns
Reverse Recovery Charge		Q_{rr}	–	3700	–	nC
Peak Reverse Recovery Current		I_{RRM}	–	68	–	A
Peak Rate of Fall of Recovery Current		di/dt	–	3000	–	A/µs
Reverse Recovery Energy		E_{rr}	–	1150	–	µJ
Reverse Recovery Time	T_J = 125°C V_{CE} = 350 V, I_C = 100 A V_{GE} = ±15 V, R_G = 4 Ω	t_{rr}	–	520	–	ns
Reverse Recovery Charge		Q_{rr}	–	9000	–	nC
Peak Reverse Recovery Current		I_{RRM}	–	102	–	A
Peak Rate of Fall of Recovery Current		di/dt	–	2600	–	A/µs
Reverse Recovery Energy		E_{rr}	–	2750	–	µJ
Thermal Resistance – chip–to–heatsink	Thermal grease, Thickness < 100 µm, λ = 0.84 W/mK	R_{thJH}	–	0.67	–	°C/W
HALF BRIDGE INVERSE DIODE CHARACTERISTICS						
Diode Forward Voltage	I_F = 7 A, T_J = 25°C	V_F	–	1.92	2.80	V
	I_F = 7 A, T_J = 150°C		–	1.37	–	
Thermal Resistance – chip–to–heatsink	Thermal grease, Thickness < 100 µm, λ = 0.84 W/mK	R_{thJH}	–	1.52	–	°C/W
NEUTRAL POINT INVERSE DIODE CHARACTERISTICS						
Diode Forward Voltage	I_F = 30 A, T_J = 25°C	V_F	–	2.24	2.75	V
	I_F = 30 A, T_J = 150°C		–	1.60	–	
Thermal Resistance – chip–to–heatsink	Thermal grease, Thickness 100 µm, λ = 0.84 W/mK	R_{thJH}	–	1.21	–	°C/W
THERMISTOR CHARACTERISTICS						
Nominal resistance		R_{25}	–	22	–	kΩ
Nominal resistance	T = 100°C	R_{100}	–	1486	–	Ω
Deviation of R25		ΔR/R	–5	–	5	%
Power dissipation		P_D	–	200	–	mW
Power dissipation constant			–	2	–	mW/K
B–value	B(25/50), tolerance ±3%		–	3950	–	K
B–value	B(25/100), tolerance ±3%		–	3998	–	K

ORDERING INFORMATION

Device	Marking	Package	Shipping
NXH160T120L2Q2F2SG Q2PACK	NXH160T120L2Q2F2SG	Q2PACK – Case 180AK (Pb–Free and Halide–Free)	12 Units / Blister Tray

TYPICAL CHARACTERISTICS – Half Bridge IGBT and Neutral Point Diode

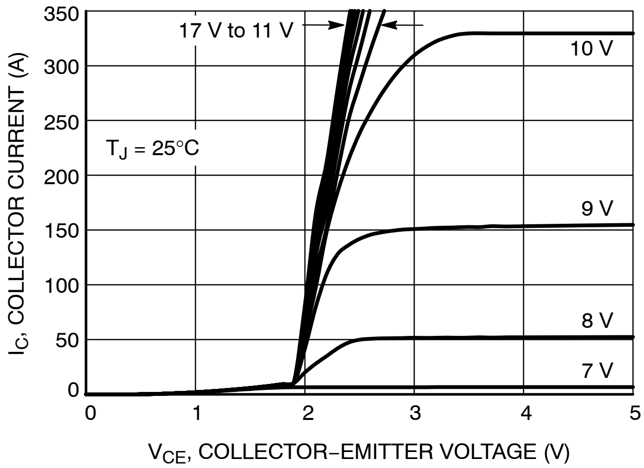


Figure 1. IGBT Typical Output Characteristics

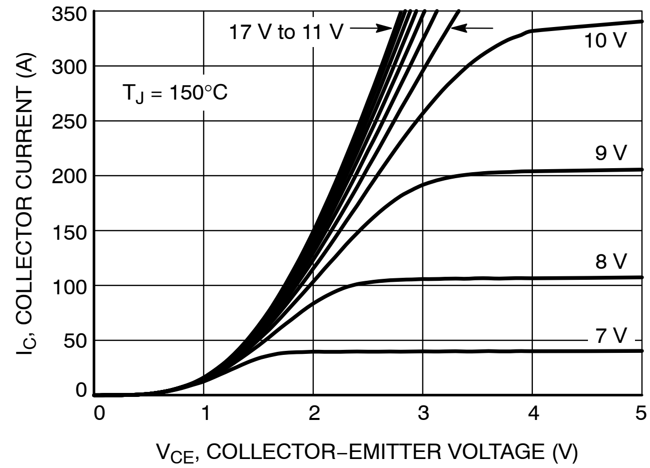


Figure 2. IGBT Typical Output Characteristics

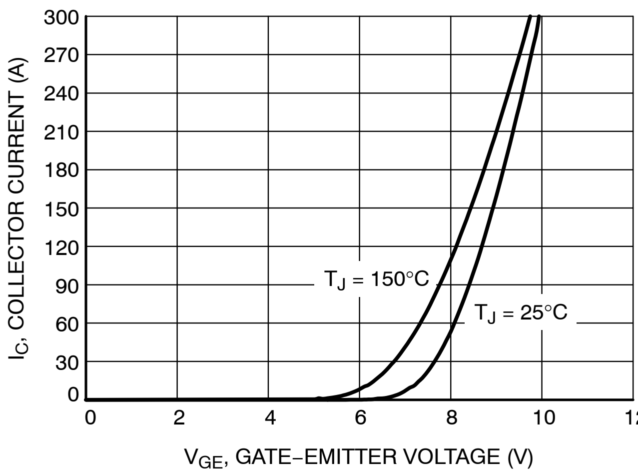


Figure 3. IGBT Typical Transfer Characteristics

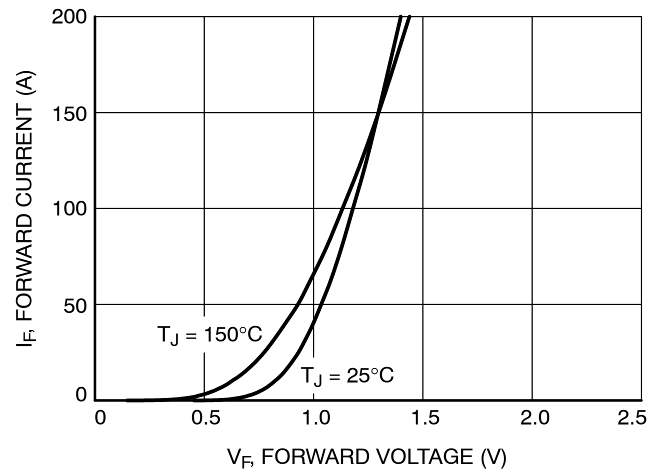


Figure 4. Diode Forward Characteristic

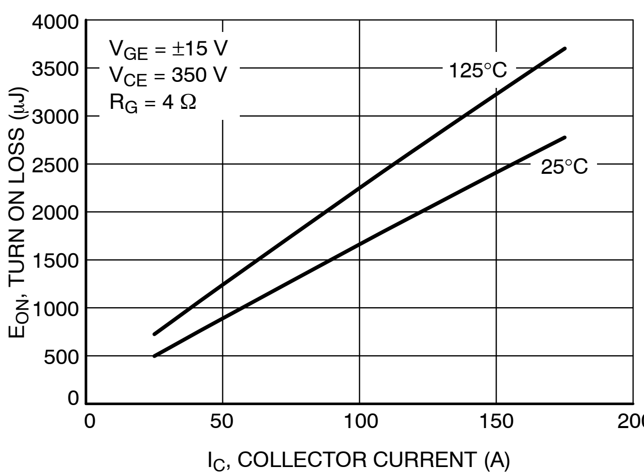


Figure 5. Typical Turn On Loss vs. IC

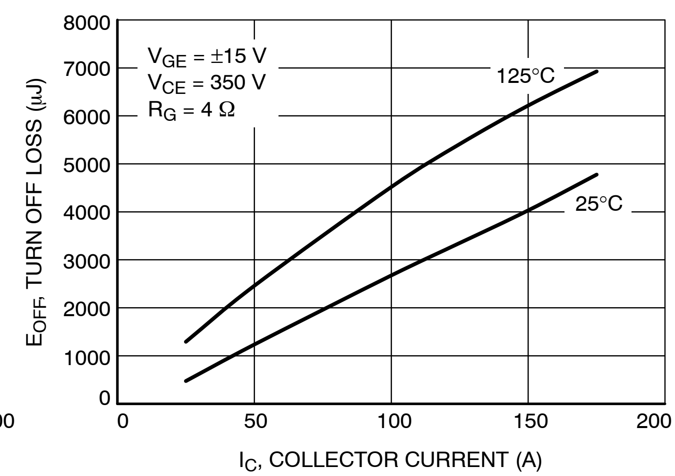


Figure 6. Typical Turn Off Loss vs. IC

TYPICAL CHARACTERISTICS – Half Bridge IGBT and Neutral Point Diode

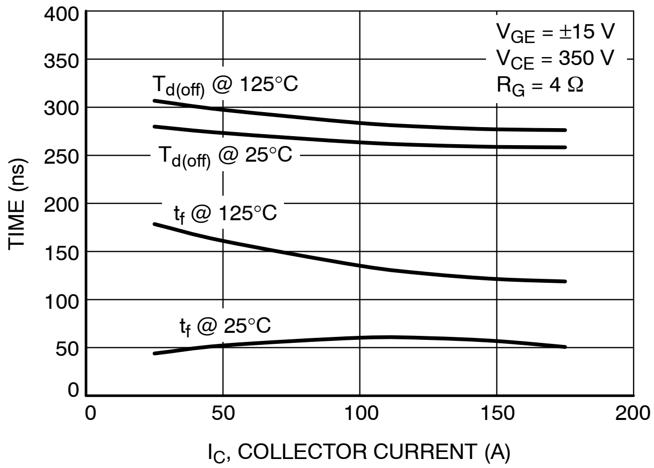


Figure 7. Typical Turn Off Time vs. IC

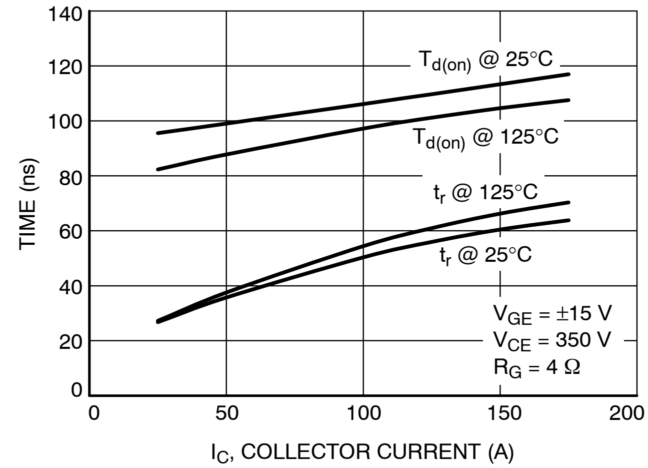


Figure 8. Typical Turn On Time vs. IC

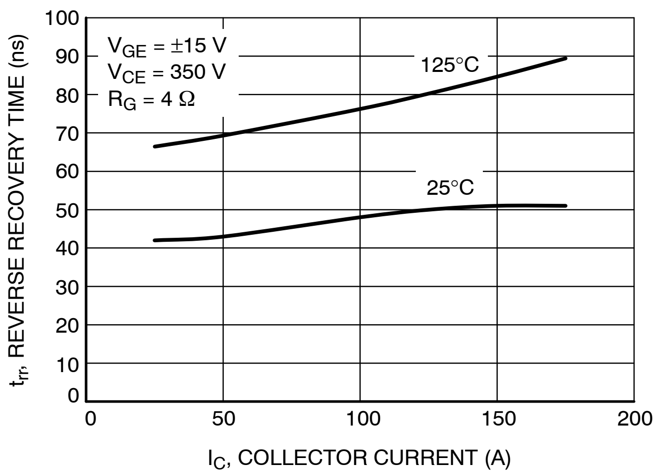


Figure 9. Typical Reverse Recovery Time vs. IC

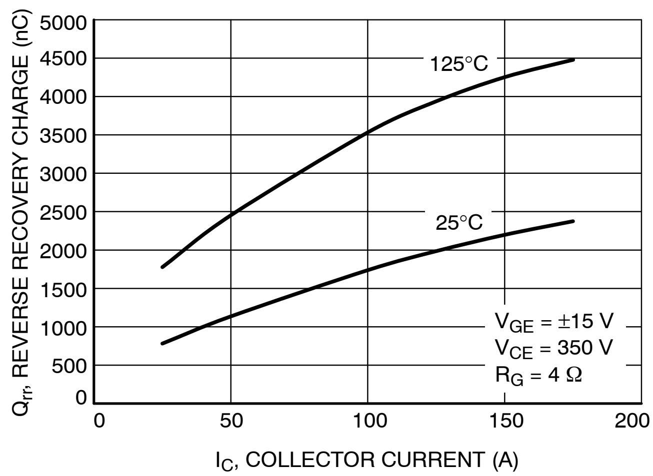


Figure 10. Typical Reverse Recovery Charge vs. IC

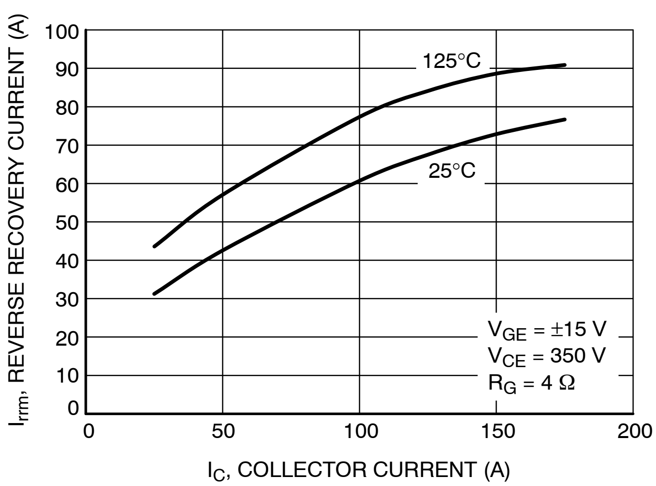


Figure 11. Typical Reverse Recovery Peak Current vs. IC

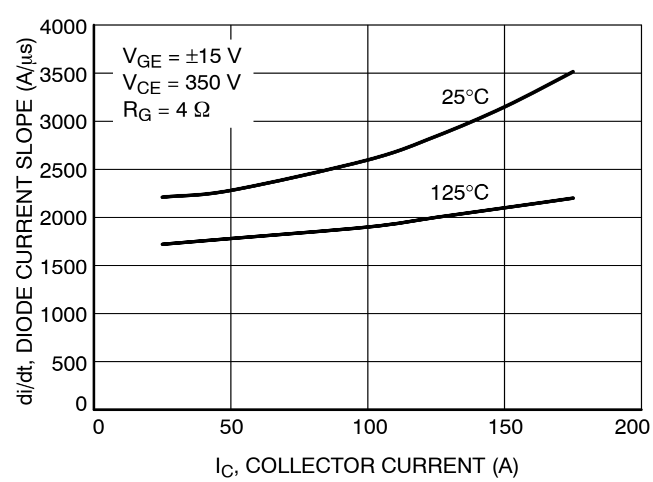


Figure 12. Typical Diode Current Slope vs. IC

TYPICAL CHARACTERISTICS – Half Bridge IGBT and Neutral Point Diode

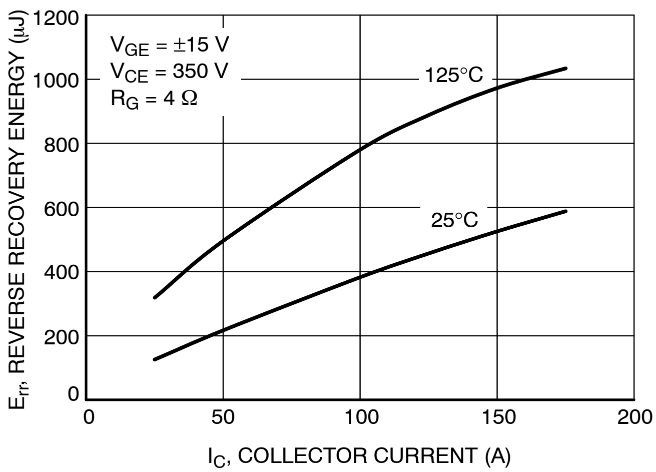


Figure 13. Typical Reverse Recovery Energy vs. IC

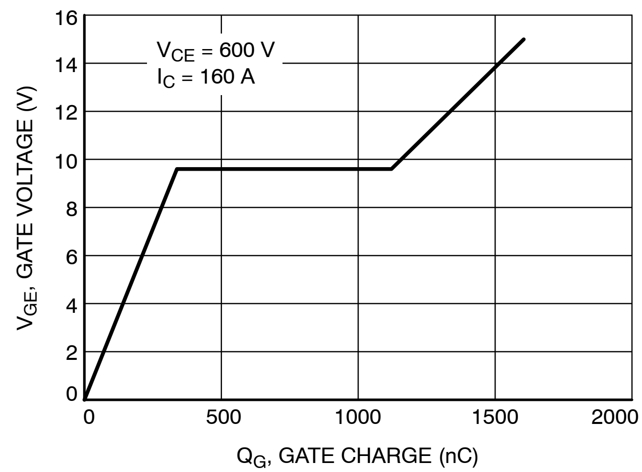


Figure 14. Gate Voltage vs. Gate Charge

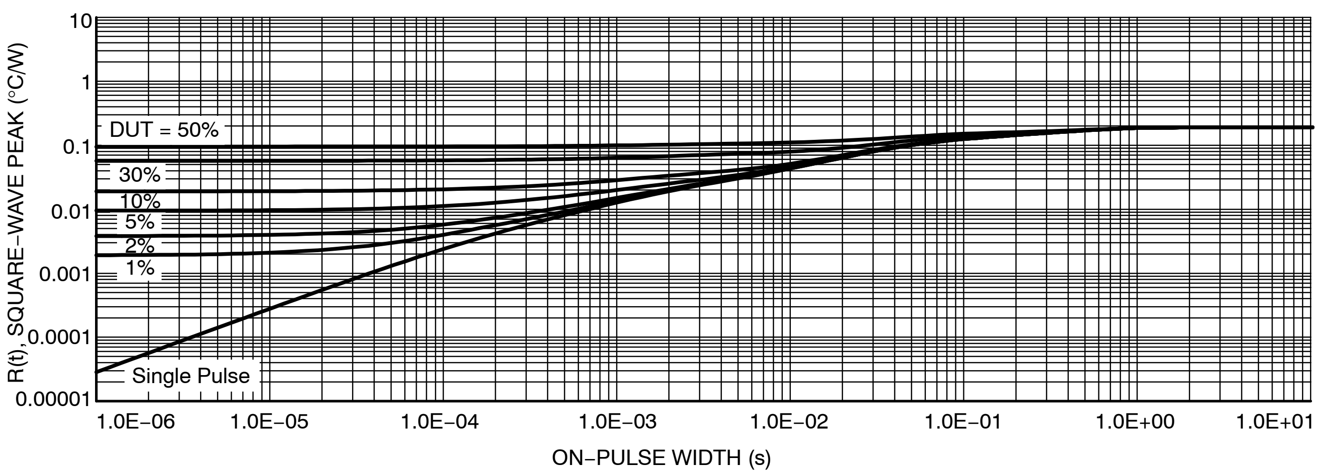


Figure 15. IGBT Transient Thermal Impedance

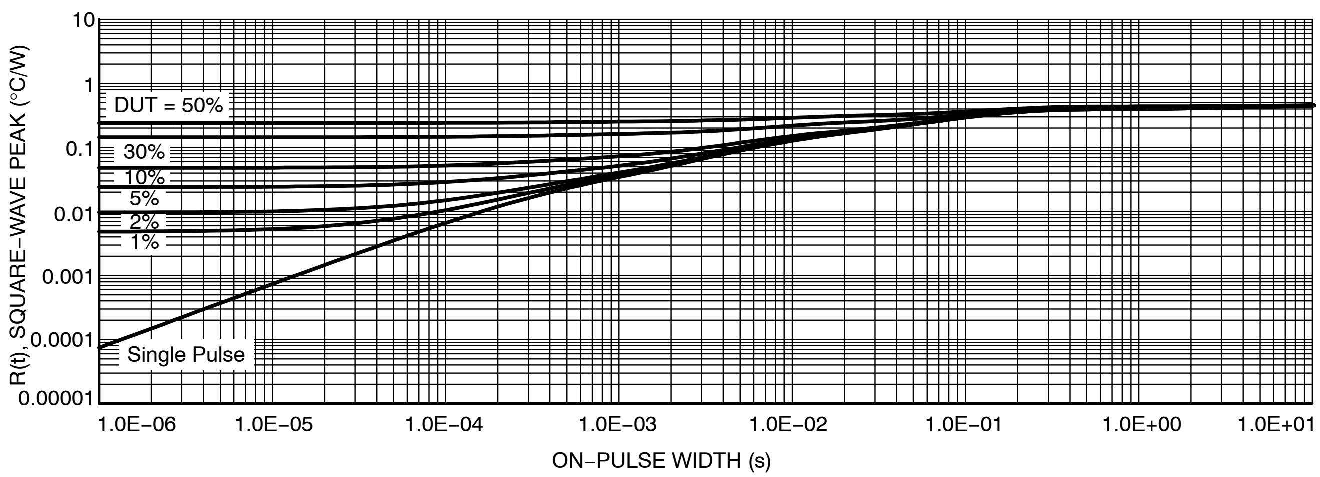


Figure 16. Diode Transient Thermal Impedance

TYPICAL CHARACTERISTICS – Neutral Point IGBT and Half Bridge Diode

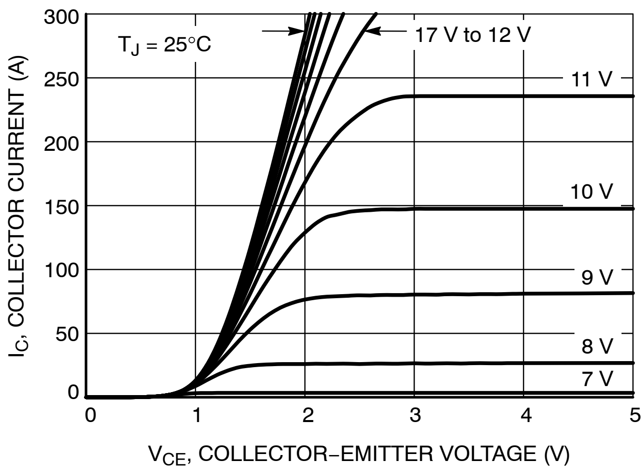


Figure 17. IGBT Typical Output Characteristics

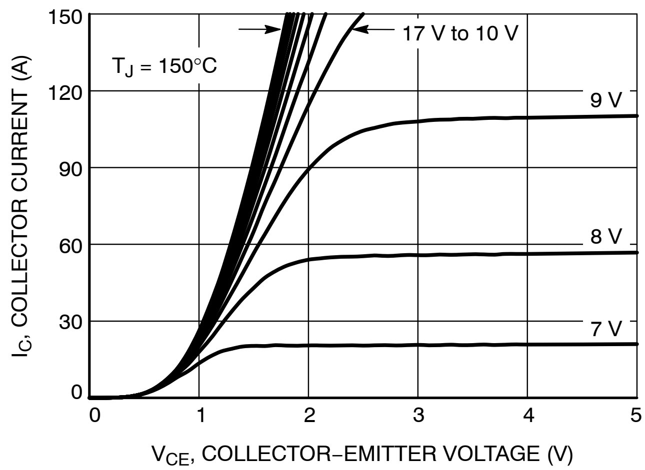


Figure 18. IGBT Typical Output Characteristics

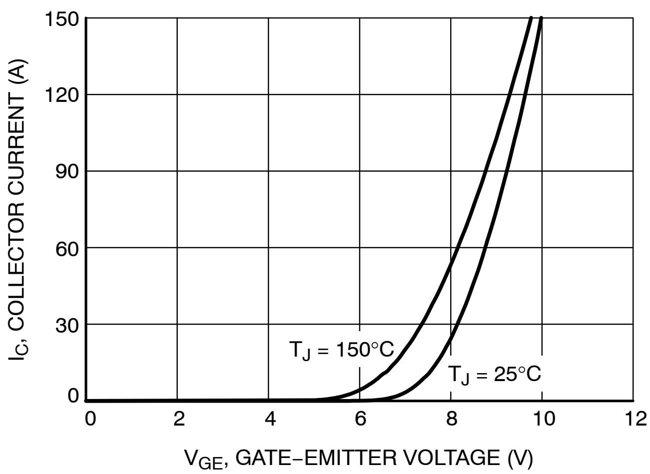


Figure 19. IGBT Typical Transfer Characteristics

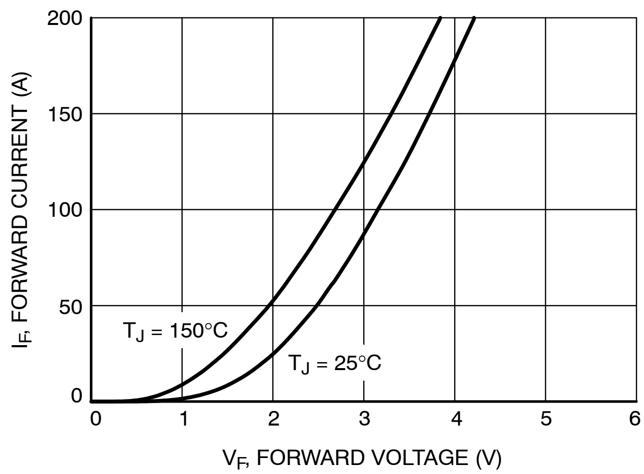


Figure 20. Diode Forward Characteristic

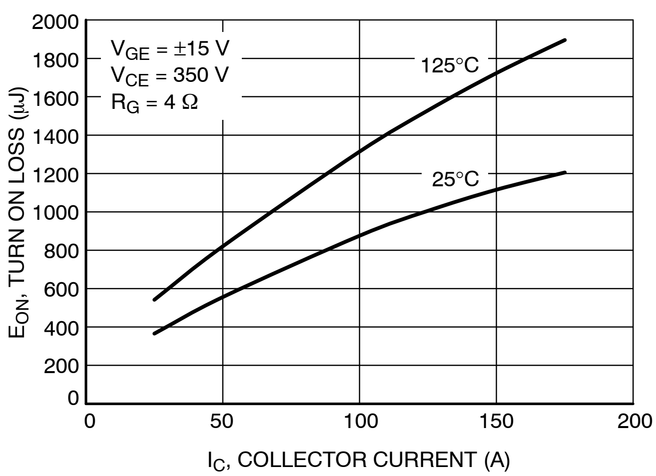


Figure 21. Typical Turn On Loss vs. IC

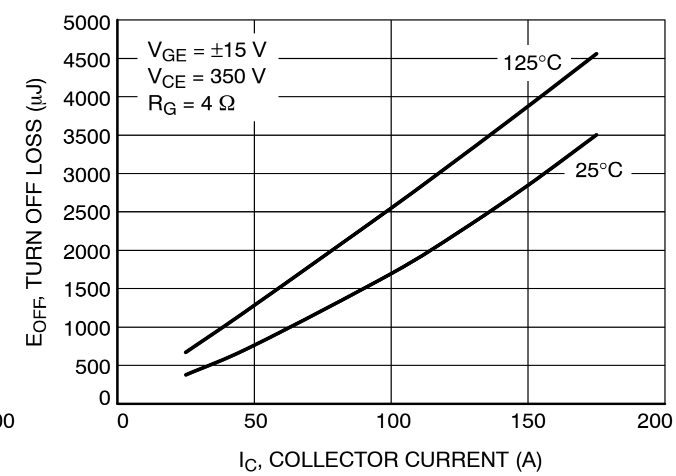


Figure 22. Typical Turn Off Loss vs. IC

TYPICAL CHARACTERISTICS – Neutral Point IGBT and Half Bridge Diode

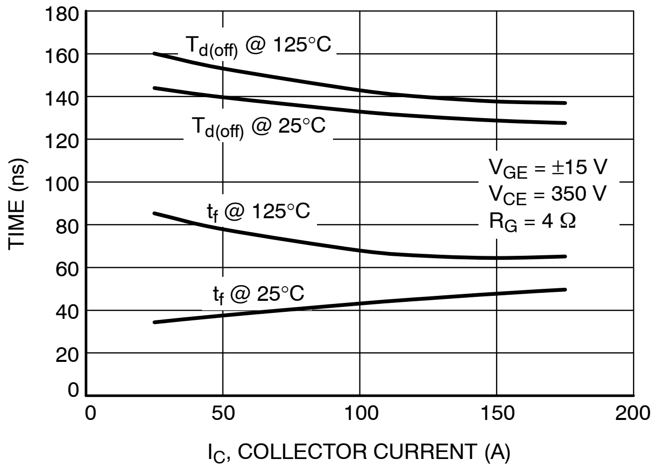


Figure 23. Typical Turn Off Time vs. IC

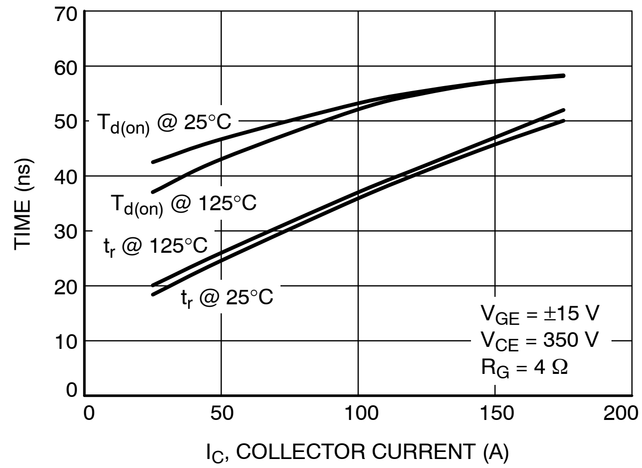


Figure 24. Typical Turn On Time vs. IC

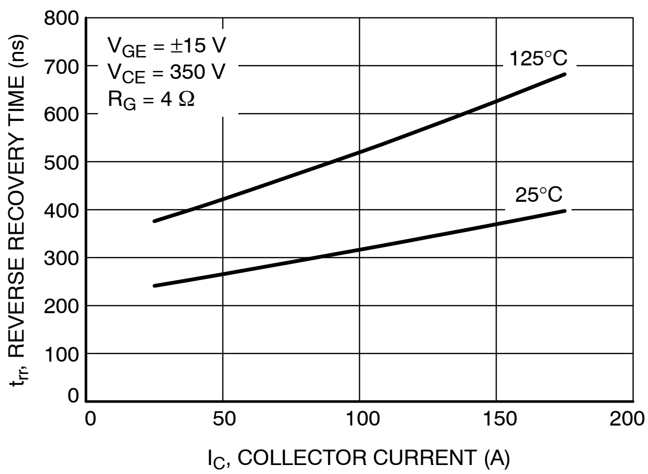


Figure 25. Typical Reverse Recovery Time vs. IC

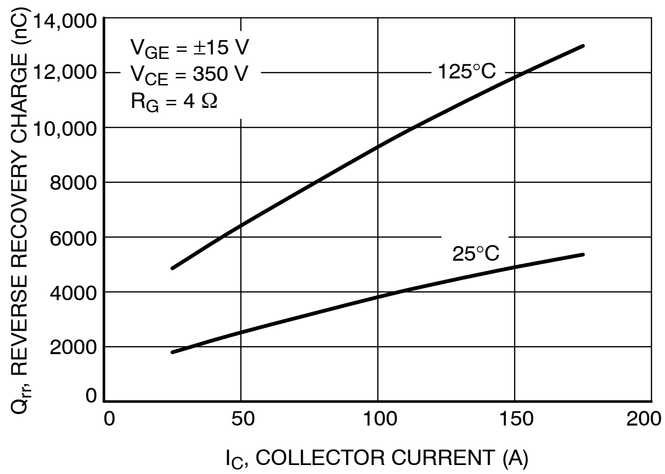


Figure 26. Typical Reverse Recovery Charge vs. IC

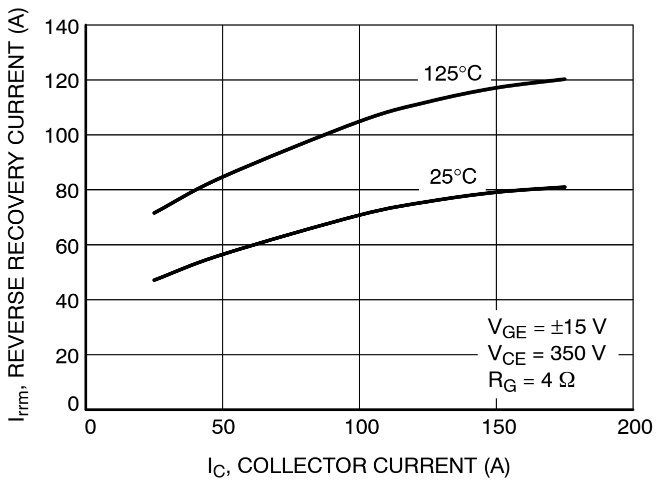


Figure 27. Typical Reverse Recovery Peak Current vs. IC

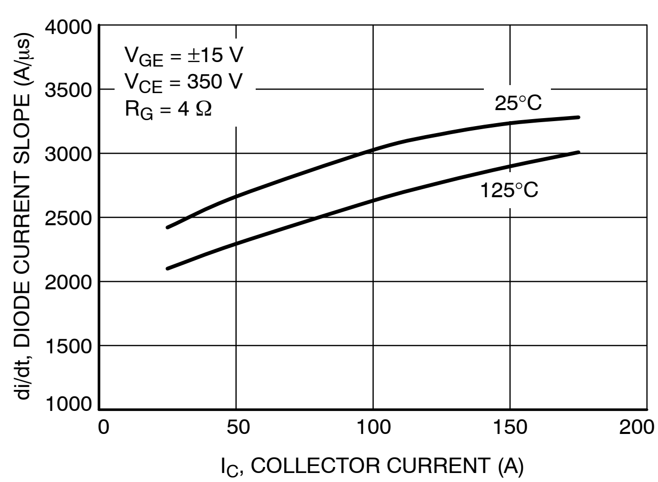


Figure 28. Typical Diode Current Slope vs. IC

TYPICAL CHARACTERISTICS – Neutral Point IGBT and Half Bridge Diode

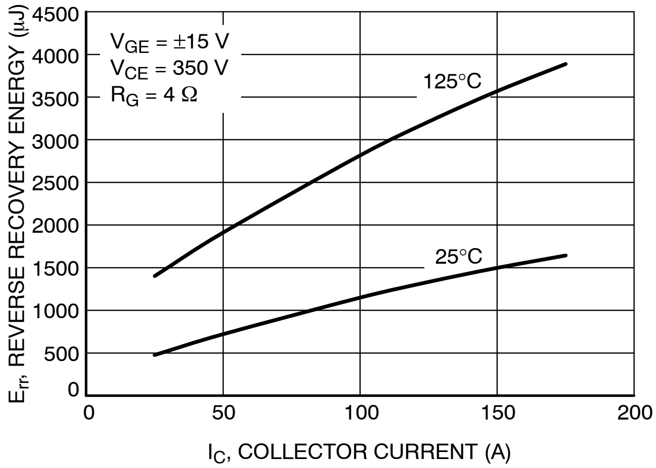


Figure 29. Typical Reverse Recovery Energy vs. IC

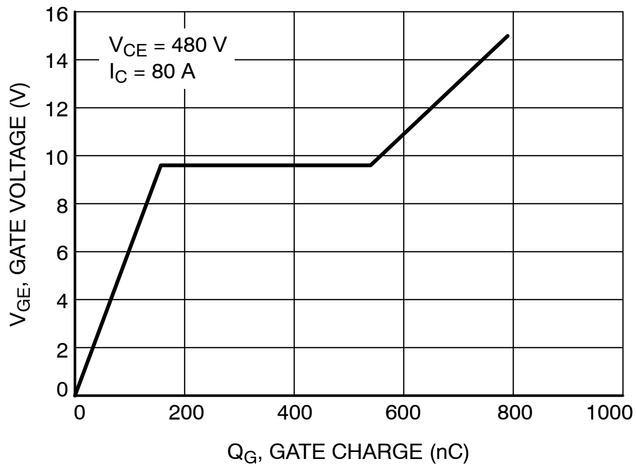


Figure 30. Gate Voltage vs. Gate Charge

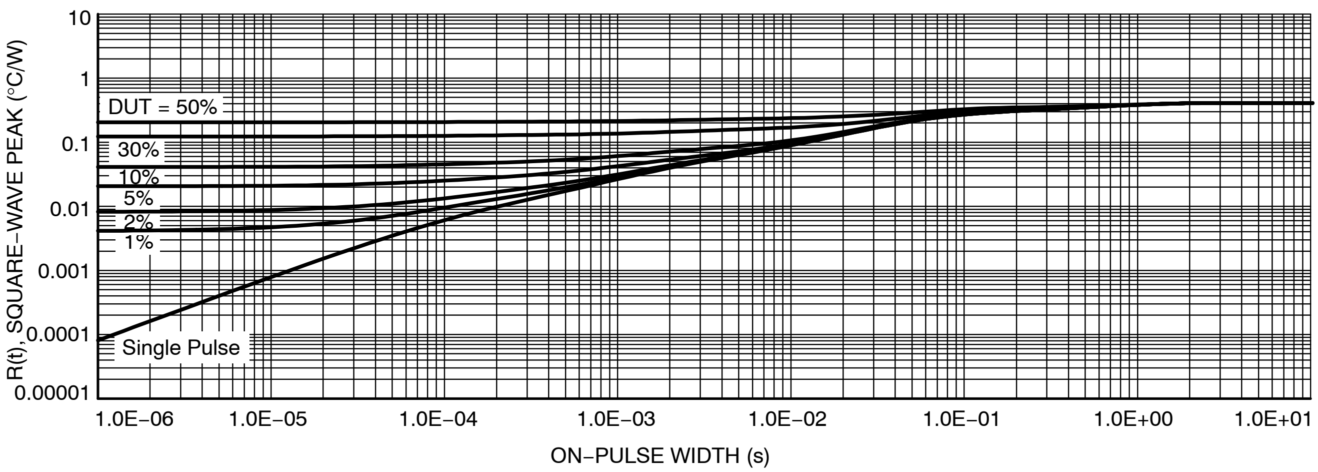


Figure 31. IGBT Transient Thermal Impedance

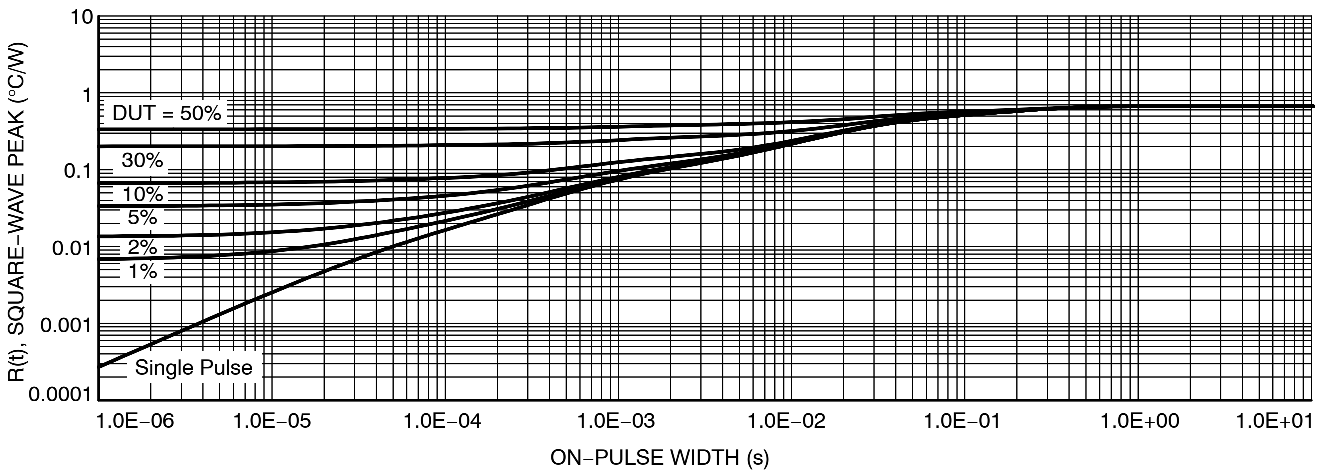


Figure 32. Diode Transient Thermal Impedance

TYPICAL CHARACTERISTICS – Half Bridge IGBT Protection Diode

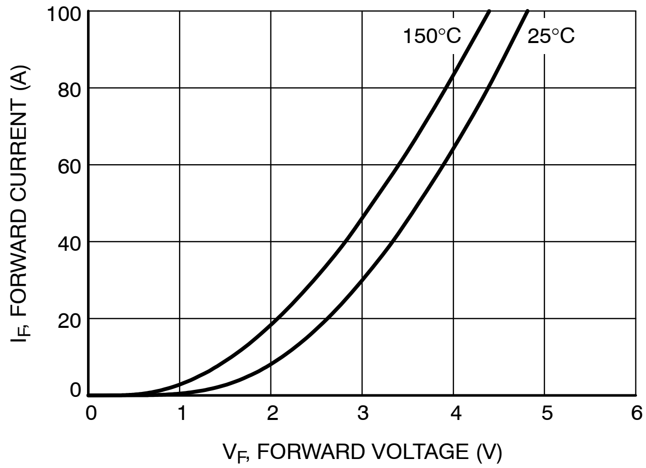


Figure 33. Diode Forward Characteristic

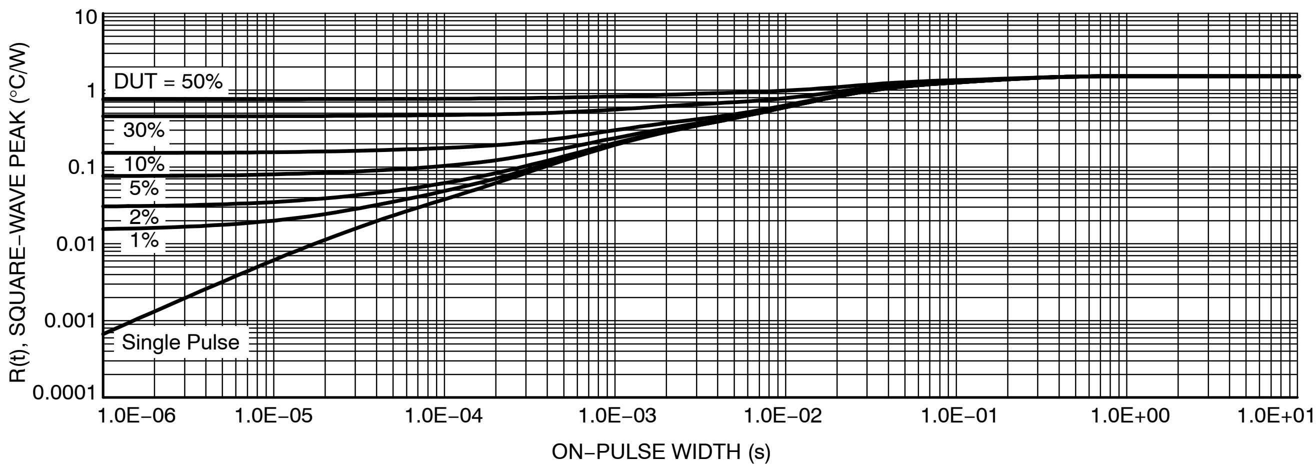


Figure 34. Diode Transient Thermal Impedance

TYPICAL CHARACTERISTICS – Neutral Point IGBT Protection Diode

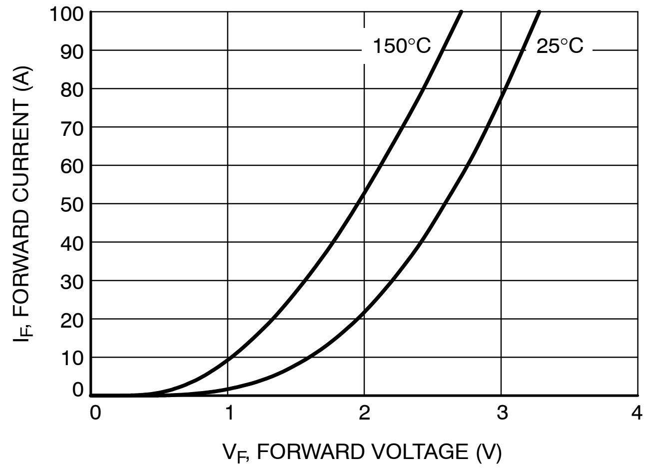


Figure 35. Diode Forward Characteristic

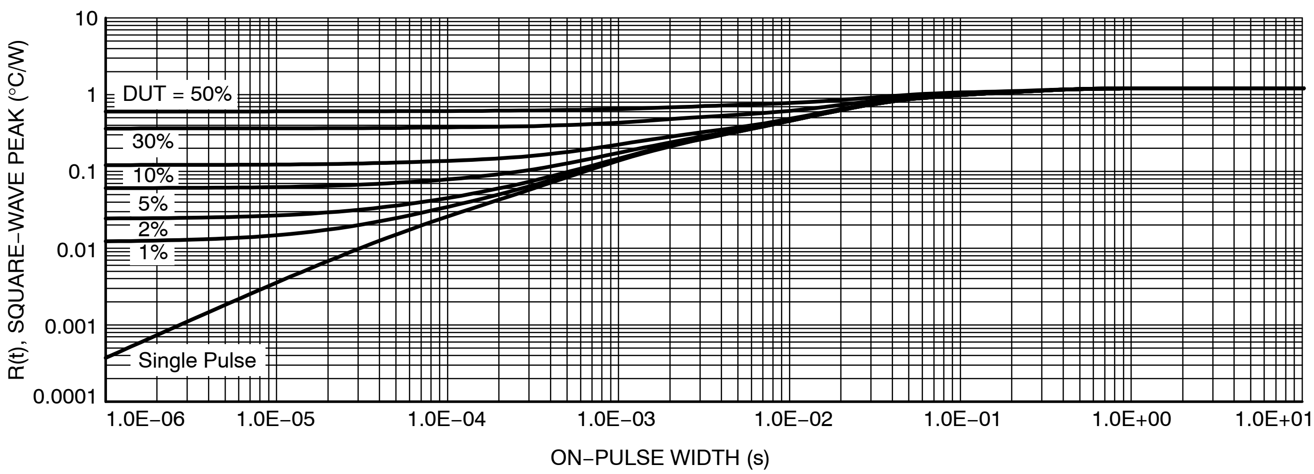


Figure 36. Diode Transient Thermal Impedance

TYPICAL CHARACTERISTICS – Thermistor

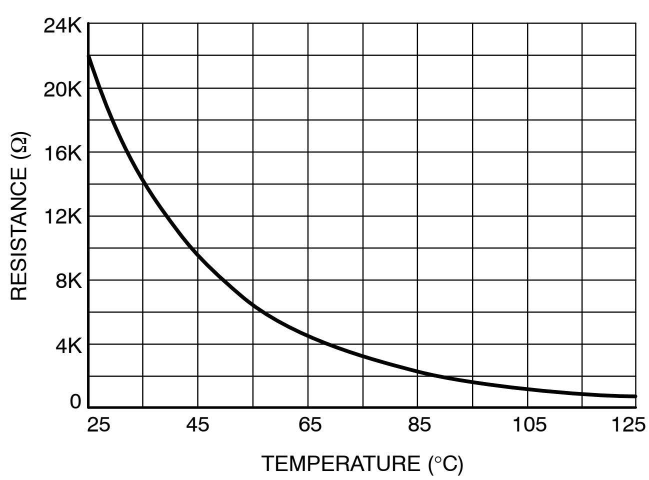
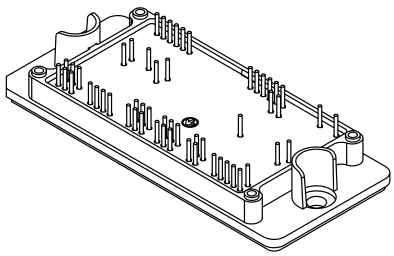
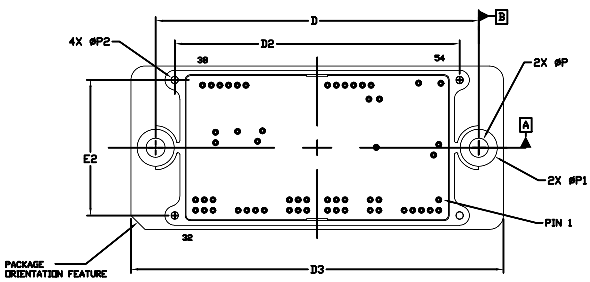


Figure 37. Thermistor Characteristics

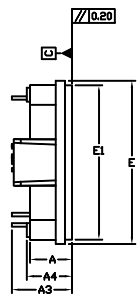


PIM56, 93x47 (SOLDER PIN)
CASE 180AK
ISSUE B

DATE 08 NOV 2017



TOP VIEW

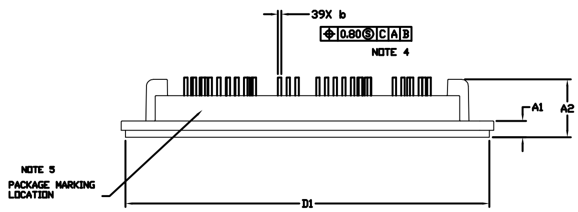


END VIEW

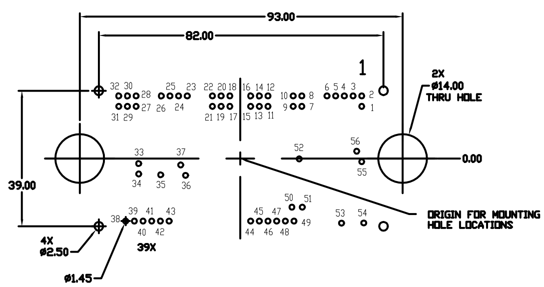
NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2009.
2. CONTROLLING DIMENSION: MILLIMETERS
3. DIMENSIONS b APPLIES TO THE PLATED TERMINALS AND IS MEASURED BETWEEN 1.00 AND 3.00 FROM THE TERMINAL TIP.
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 WITH THE PACKAGE ORIENTATION FEATURE.

DIM	MILLIMETERS MIN.	MILLIMETERS MAX.
A	11.80	12.20
A1	4.50	4.90
A2	16.50	16.90
A3	16.70	17.70
A4	12.80	13.20
b	0.95	1.05
D	92.80	93.20
D1	104.60	104.90
D2	81.80	82.20
D3	106.90	107.50
E	46.75	47.25
E1	44.30	44.50
E2	38.80	39.20
P	5.40	5.60
P1	10.60	10.80
P2	2.20	2.40



SIDE VIEW



RECOMMENDED MOUNTING PATTERN

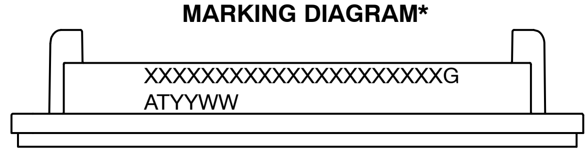
NOTE 4

PIN	PIN POSITION X	PIN POSITION Y	PIN	PIN POSITION X	PIN POSITION Y
1	35.00	−15.00	29	−32.50	−15.00
2	35.00	−18.00	30	−32.50	−18.00
3	32.50	−18.00	31	−35.00	−15.00
4	30.00	−18.00	32	−35.00	−18.00
5	27.50	−18.00	33	−29.25	1.45
6	25.00	−18.00	34	−29.25	4.45
7	17.75	−15.00	35	−22.90	4.70
8	17.75	−18.00	36	−15.75	4.85
9	15.25	−15.00	37	−17.15	1.85
10	15.25	−18.00	38	−33.00	18.00
11	8.00	−15.00	39	−30.50	18.00
12	8.00	−18.00	40	−28.00	18.00
13	5.50	−15.00	41	−25.50	18.00
14	5.50	−18.00	42	−23.00	18.00
15	3.00	−15.00	43	−20.50	18.00
16	3.00	−18.00	44	3.00	18.00
17	−3.00	−15.00	45	5.50	18.00
18	−3.00	−18.00	46	8.00	18.00
19	−5.50	−15.00	47	10.50	18.00
20	−5.50	−18.00	48	13.00	18.00
21	−8.00	−15.00	49	15.50	18.00
22	−8.00	−18.00	50	14.90	14.00
23	−15.25	−18.00	51	17.90	14.00
24	−17.75	−18.00	52	17.00	0.10
25	−20.25	−18.00	53	29.20	18.60
26	−22.75	−18.00	54	35.60	18.55
27	−30.00	−15.00	55	35.00	0.90
28	−30.00	−18.00	56	33.55	−2.10

MOUNTING HOLE POSITION

PIN	PIN POSITION X	PIN POSITION Y	PIN	PIN POSITION X	PIN POSITION Y
1	35.00	15.00	29	−32.50	15.00
2	35.00	18.00	30	−32.50	18.00
3	32.50	18.00	31	−35.00	15.00
4	30.00	18.00	32	−35.00	18.00
5	27.50	18.00	33	−29.25	−1.45
6	25.00	18.00	34	−29.25	−4.45
7	17.75	15.00	35	−22.90	−4.70
8	17.75	18.00	36	−15.75	−4.85
9	15.25	15.00	37	−17.15	−1.85
10	15.25	18.00	38	−33.00	−18.00
11	8.00	15.00	39	−30.50	−18.00
12	8.00	18.00	40	−28.00	−18.00
13	5.50	15.00	41	−25.50	−18.00
14	5.50	18.00	42	−23.00	−18.00
15	3.00	15.00	43	−20.50	−18.00
16	3.00	18.00	44	3.00	−18.00
17	−3.00	15.00	45	5.50	−18.00
18	−3.00	18.00	46	8.00	−18.00
19	−5.50	15.00	47	10.50	−18.00
20	−5.50	18.00	48	13.00	−18.00
21	−8.00	15.00	49	15.50	−18.00
22	−8.00	18.00	50	14.90	−14.00
23	−15.25	18.00	51	17.90	−14.00
24	−17.75	18.00	52	17.00	−0.10
25	−20.25	18.00	53	29.20	−18.60
26	−22.75	18.00	54	35.60	−18.55
27	−30.00	15.00	55	35.00	−0.90
28	−30.00	18.00	56	33.55	2.10

GENERIC MARKING DIAGRAM*



XXXXX = Specific Device Code
G = Pb−Free Package
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:	**98AON63482G**	Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped “CONTROLLED COPY” in red.
DESCRIPTION:	**PIM56 93X47 (SOLDER PIN)**	**PAGE 1 OF 1**

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
Email Requests to: orderlit@onsemi.com

onsemi Website: www.onsemi.com

TECHNICAL SUPPORT
North American Technical Support:
Voice Mail: 1 800−282−9855 Toll Free USA/Canada
Phone: 011 421 33 790 2910

Europe, Middle East and Africa Technical Support:
Phone: 00421 33 790 2910
For additional information, please contact your local Sales Representative

◊