Split T-Type NPC Power Module

1200 V, 160 A IGBT, 650 V, 100 A IGBT

The NXH160T120L2Q2F2S1G 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 / 650 V rectifiers, two 100 A / 650 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: $V_{CE(SAT)} = 2.15 \text{ V}$, $E_{SW} = 4300 \mu\text{J}$
- 650 V IGBT specifications: $V_{CE(SAT)} = 1.47 \text{ V}$, $E_{SW} = 2560 \mu\text{J}$
- Baseplate
- Solderable Pins
- Thermistor

Typical Applications

- Solar Inverters
- Uninterruptible Power Supplies

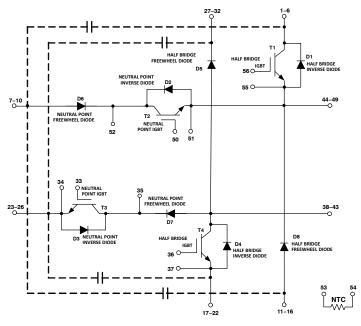
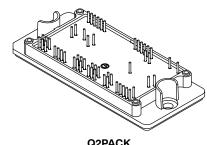


Figure 1. NXH160T120L2Q2F2S1G Schematic Diagram



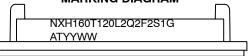
ON Semiconductor®

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Q2PACK CASE 180AK

MARKING DIAGRAM



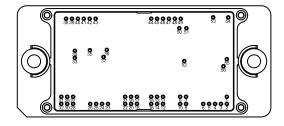
NXH160T120L2Q2F2S1G = Device Code YYWW = Year and Work Week Code

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.

Table 1. ABSOLUTE MAXIMUM RATINGS (Note 1) T_{.1} = 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	А
Pulsed Collector Current (T _J = 175°C)	I _{Cpulse}	543	А
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, $T_{J} \le$ 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}	650	V
Gate-Emitter Voltage	V_{GE}	±20	V
Continuous Collector Current @ T _h = 80°C (T _J = 175°C)	I _C	116	А
Pulsed Collector Current (T _J = 175°C)	I _{Cpulse}	348	А
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, $T_{J} \le 150$ °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 @ $T_h = 80^{\circ}C$ ($T_J = 175^{\circ}C$)	I _F	56	А
Repetitive Peak Forward Current (T _J = 175°C, t _p limited by T _{Jmax})	I _{FRM}	150	А
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 @ $T_h = 80^{\circ}C$ ($T_J = 175^{\circ}C$)	I _F	19	А
Repetitive Peak Forward Current ($T_J = 175^{\circ}C$, t_p limited by T_{Jmax})	I _{FRM}	50	А
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}	650	V
Continuous Forward Current @ T _h = 80°C (T _J = 175°C)	I _F	132	А
Repetitive Peak Forward Current (T _J = 175°C, t _p limited by T _{Jmax})	I _{FRM}	300	А
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}	650	V
Continuous Forward Current @ T _h = 80°C (T _J = 175°C)	I _F	38	А
Repetitive Peak Forward Current (T _J = 175°C, t _p limited by T _{Jmax})	I _{FRM}	110	А
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) $T_J = 25^{\circ}C$ unless otherwise noted

Symbol	Value	Unit
T_{JMAX}	150	°C
T _{stg}	-40 to 125	°C
V _{is}	3000	V_{RMS}
	12.7	mm
	T _{JMAX}	T _{JMAX} 150 T _{stg} -40 to 125 V _{is} 3000

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

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

Parameter	Test Conditions	Symbol	Min	Тур	Max	Unit
HALF BRIDGE IGBT CHARACTERISTICS	3					
Collector-Emitter Cutoff Current	V _{GE} = 0 V, V _{CE} = 1200 V	I _{CES}	-	_	500	μΑ
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	t _{d(on)}	-	105	-	ns
Rise Time	$V_{CE} = 350 \text{ V, } I_{C} = 100 \text{ A}$ $V_{GE} = \pm 15 \text{ V, } R_{G} = 4 \Omega$	t _r	-	50	-	
Turn-off Delay Time	a de la significación de la companya	t _{d(off)}	-	270	-	
Fall Time	7	t _f	-	55	-	
Turn-on Switching Loss per Pulse	7	E _{on}	-	1700	-	μJ
Turn off Switching Loss per Pulse	1	E _{off}	=	2600	=	
Turn-on Delay Time	T _J = 125°C	t _{d(on)}	=	95	=	ns
Rise Time	$V_{CE} = 350 \text{ V, } I_{C} = 100 \text{ A}$ $V_{GF} = \pm 15 \text{ V, } R_{G} = 4 \Omega$	t _r	=	55	=	
Turn-off Delay Time		t _{d(off)}	-	285	-	
Fall Time	7	t _f	-	150	-	
Turn-on Switching Loss per Pulse	7	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	7	C _{oes}	-	800	-	
Reverse Transfer Capacitance	7	C _{res}	=	680	=	
Total Gate Charge	V _{CE} = 600 V, I _C = 160 A, V _{GE} = 15 V	Qg	-	1600	-	nC
Thermal Resistance - chip-to-heatsink	Thermal grease, Thickness < 100 μ m, λ = 0.84 W/mK	R _{thJH}	_	0.19	_	°C/W

Operating parameters.

Table 3. ELECTRICAL CHARACTERISTICS T_{.1} = 25°C unless otherwise noted

Parameter	Test Conditions	Symbol	Min	Тур	Max	Unit
NEUTRAL POINT FREEWHEEL DIODE C	HARACTERISTICS				•	
Diode Reverse Leakage Current	V _R = 650 V	I _R	_	-	100	μΑ
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	t _{rr}	_	50	_	ns
Reverse Recovery Charge	V_{CE} = 350 V, I_{C} = 100 A V_{GE} = ±15 V, R_{G} = 4 Ω	Q _{rr}	_	1700	_	nC
Peak Reverse Recovery Current	- VGE - 110 V, NG - 111	I _{RRM}	=	59	=	Α
Peak Rate of Fall of Recovery Current	1	di/dt	=	2500	=	A/μs
Reverse Recovery Energy		E _{rr}	=	380	=	μЈ
Reverse Recovery Time	T _J = 125°C	t _{rr}	-	77	_	ns
Reverse Recovery Charge	V_{CE} = 350 V, I_{C} = 100 A V_{GE} = ±15 V, R_{G} = 4 Ω	Q _{rr}	-	3600	_	nC
Peak Reverse Recovery Current	UGE - ±13 V, HG - 4 32	I _{RRM}	_	77	_	Α
Peak Rate of Fall of Recovery Current	1	di/dt	_	1900	_	A/μs
Reverse Recovery Energy	1	E _{rr}	=	780	=	μJ
Thermal Resistance - chip-to-heatsink	Thermal grease, Thickness < 100 μ m, λ = 0.84 W/mK	R _{thJH}	-	0.48	=	°C/W
NEUTRAL POINT IGBT CHARACTERIST	ics					•
Collector-Emitter Cutoff Current	V _{GE} = 0 V, V _{CE} = 650 V	I _{CES}	-	_	300	μΑ
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	t _{d(on)}	_	50	_	ns
Rise Time	V_{CE} = 350 V, I_{C} = 100 A V_{GE} = ±15 V, R_{G} = 4 Ω	t _r	-	35	_	
Turn-off Delay Time		t _{d(off)}	-	135	_	
Fall Time		t _f	-	40	_	
Turn-on Switching Loss per Pulse	1	E _{on}	-	870	_	μJ
Turn off Switching Loss per Pulse		E _{off}	-	1690	_	
Turn-on Delay Time	T _J = 125°C	t _{d(on)}	-	50	_	ns
Rise Time	$V_{CE} = 350 \text{ V, I}_{C} = 100 \text{ A}$ $V_{GE} = \pm 15 \text{ V, R}_{G} = 4 \Omega$	t _r	-	37	_	
Turn-off Delay Time		t _{d(off)}	_	145	_	
Fall Time	1	t _f	_	65	_	
Turn-on Switching Loss per Pulse	1	E _{on}	_	1300	_	μJ
Turn off Switching Loss per Pulse	1	E _{off}	_	2500	_	1
Input Capacitance	V _{CE} = 25 V, V _{GE} = 0 V, f = 10 kHz	C _{ies}	_	18800	_	pF
Output Capacitance	1	C _{oes}	_	560	_	1
Reverse Transfer Capacitance	1	C _{res}	_	500	_	1
Total Gate Charge	V _{CE} = 480 V, I _C = 80 A, V _{GE} = 15 V	Qg	=	790	_	nC
Thermal Resistance - chip-to-heatsink	Thermal grease, Thickness < 100 μ m, λ = 0.84 W/mK	R _{thJH}	-	0.41	_	°C/W

Table 3. ELECTRICAL CHARACTERISTICS T_{JI} = 25°C unless otherwise noted

Parameter	Test Conditions	Test Conditions Symbol				Unit
HALF BRIDGE FREEWHEEL DIODE CHA	ARACTERISTICS			•	•	
Diode Reverse Leakage Current	V _R = 1200 V	I _R	_	_	100	μΑ
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	t _{rr}	_	320	_	ns
Reverse Recovery Charge	$V_{CE} = 350 \text{ V, } I_{C} = 100 \text{ A}$ $V_{GE} = \pm 15 \text{ V, } R_{G} = 4 \Omega$	Q_{rr}	-	3700	_	nC
Peak Reverse Recovery Current	- GE , G	I _{RRM}	-	68	_	Α
Peak Rate of Fall of Recovery Current	7	di/dt	-	3000	_	A/μs
Reverse Recovery Energy	7	E _{rr}	_	1150	_	μJ
Reverse Recovery Time	T _J = 125°C	t _{rr}	_	520	_	ns
Reverse Recovery Charge	$V_{CE} = 350 \text{ V, } I_{C} = 100 \text{ A}$ $V_{GE} = \pm 15 \text{ V, } R_{G} = 4 \Omega$	Q_{rr}	_	9000	_	nC
Peak Reverse Recovery Current	- GE , G	I _{RRM}	_	102	_	Α
Peak Rate of Fall of Recovery Current	7	di/dt	-	2600	_	A/μs
Reverse Recovery Energy	7	E _{rr}	_	2750	_	μЈ
Thermal Resistance – chip-to-heatsink	Thermal grease, Thickness < 100 μ m, λ = 0.84 W/mK	R _{thJH}	-	0.67	=	°C/W
HALF BRIDGE INVERSE DIODE CHARA	CTERISTICS			•	•	
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 μ m, λ = 0.84 W/mK	R _{thJH}	=	1.52	=	°C/W
NEUTRAL POINT INVERSE DIODE CHAP	RACTERISTICS			•	•	
Diode Forward Voltage	I _F = 30 A, T _J = 25°C	V _F	_	2.72	3.2	V
	I _F = 30 A, T _J = 150°C		-	1.91	-	
Thermal Resistance – chip-to-heatsink	Thermal grease, Thickness 100 μ m, 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
NXH160T120L2Q2F2S1G	NXH160T120L2Q2F2S1G	Q2PACK - Case 180AK (Pb-Free and Halide-Free)	12 Units / Blister Tray

TYPICAL CHARACTERISTICS - Half Bridge IGBT and Neutral Point Diode

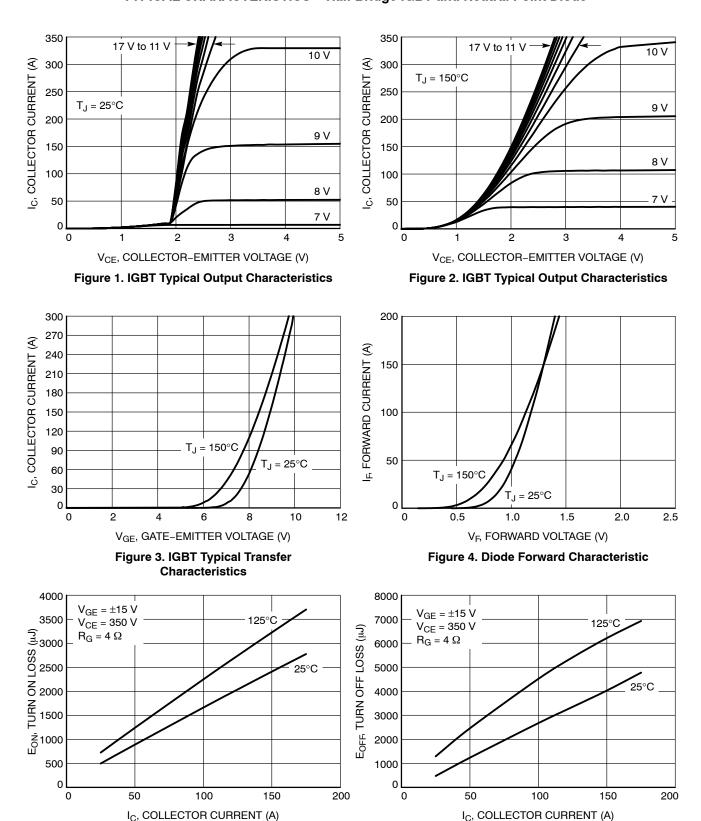


Figure 6. Typical Turn Off Loss vs. IC

Figure 5. Typical Turn On Loss vs. IC

TYPICAL CHARACTERISTICS - Half Bridge IGBT and Neutral Point Diode

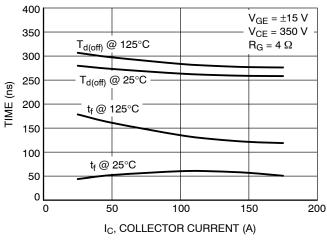


Figure 7. Typical Turn Off Time vs. IC

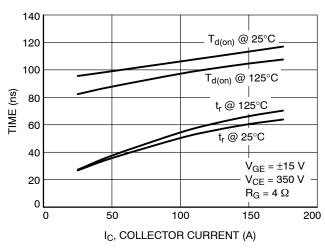


Figure 8. Typical Turn On Time vs. IC

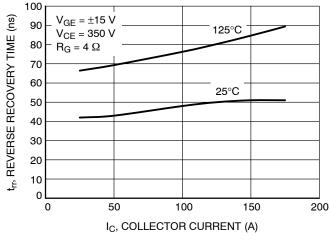


Figure 9. Typical Reverse Recovery Time vs. IC

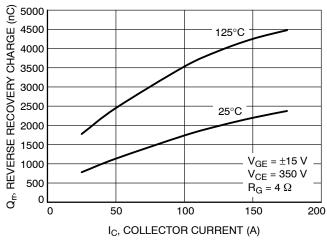


Figure 10. Typical Reverse Recovery Charge vs. IC

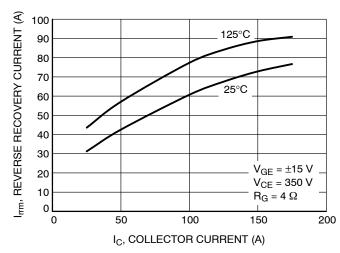


Figure 11. Typical Reverse Recovery Peak
Current vs. IC

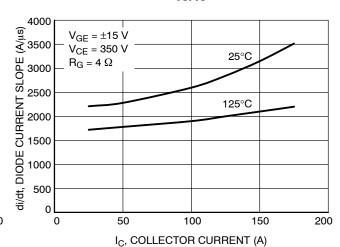
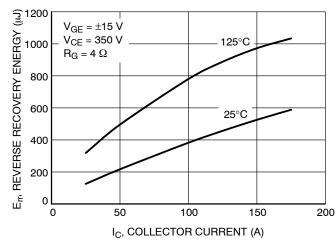


Figure 12. Typical Diode Current Slope vs. IC

TYPICAL CHARACTERISTICS - Half Bridge IGBT and Neutral Point Diode



16 V_{CE} = 600 V 14 I_C = 160 A V_{GE}, GATE VOLTAGE (V) 12 10 8 6 4 2 500 1000 1500 2000 0 Q_G, GATE CHARGE (nC)

Figure 13. Typical Reverse Recovery Energy vs. IC

Figure 14. Gate Voltage vs. Gate Charge

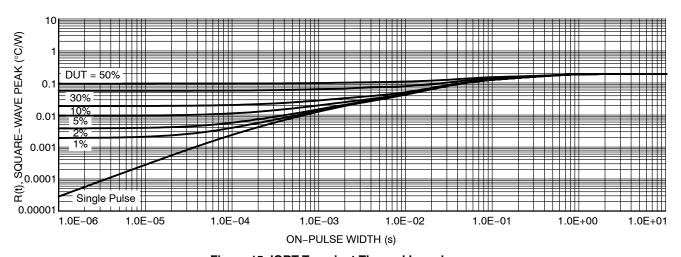


Figure 15. IGBT Transient Thermal Impedance

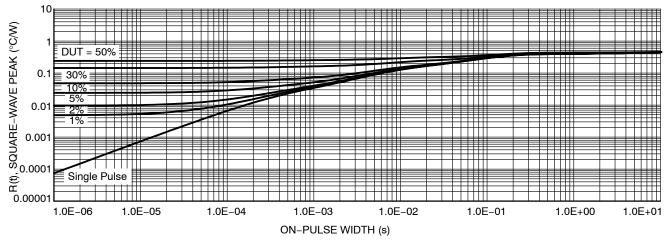


Figure 16. Diode Transient Thermal Impedance

TYPICAL CHARACTERISTICS - Neutral Point IGBT and Half Bridge Diode

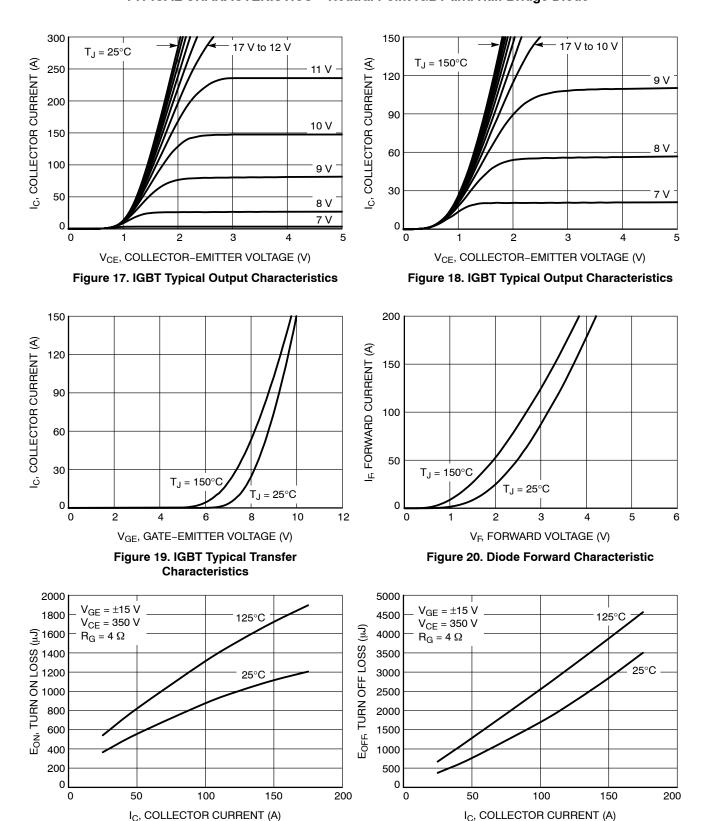
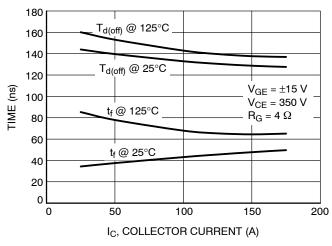


Figure 22. Typical Turn Off Loss vs. IC

Figure 21. Typical Turn On Loss vs. IC

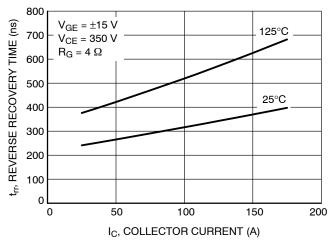
TYPICAL CHARACTERISTICS - Neutral Point IGBT and Half Bridge Diode



70 60 T_{d(on)} @ 25°C 50 TIME (ns) 40 T_{d(on)} @ 125°C 30 t_r @ 125°C 20 t_r @ 25°C $V_{GE} = \pm 15 V$ V_{CE} = 350 V 10 $R_G = 4 \Omega$ 0 50 100 150 200 0 IC, COLLECTOR CURRENT (A)

Figure 23. Typical Turn Off Time vs. IC

Figure 24. Typical Turn On Time vs. IC



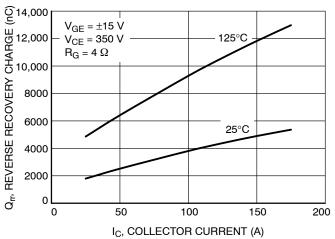
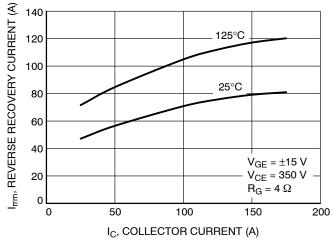


Figure 25. Typical Reverse Recovery Time vs.

Figure 26. Typical Reverse Recovery Charge vs. IC



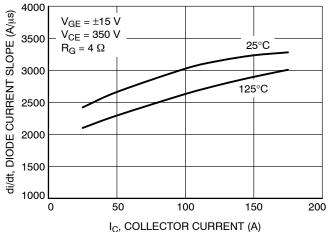
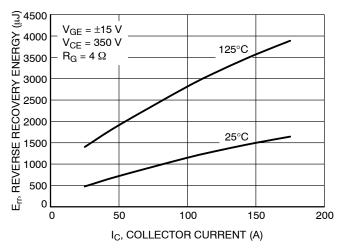


Figure 27. Typical Reverse Recovery Peak
Current vs. IC

Figure 28. Typical Diode Current Slope vs. IC

TYPICAL CHARACTERISTICS - Neutral Point IGBT and Half Bridge Diode



16 V_{CE} = 480 V 14 I_C = 80 A V_{GE}, GATE VOLTAGE (V) 12 10 8 6 4 2 0 200 400 600 800 1000 0 Q_G, GATE CHARGE (nC)

Figure 29. Typical Reverse Recovery Energy vs. IC

Figure 30. Gate Voltage vs. Gate Charge

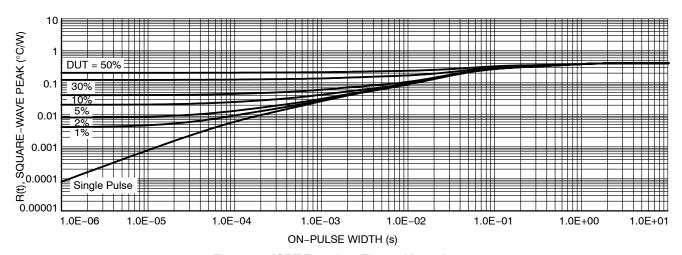


Figure 31. IGBT Transient Thermal Impedance

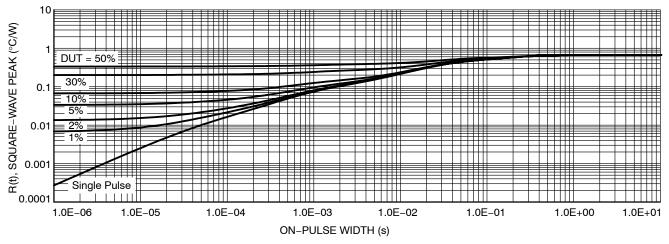


Figure 32. Diode Transient Thermal Impedance

TYPICAL CHARACTERISTICS - Half Bridge IGBT Protection Diode

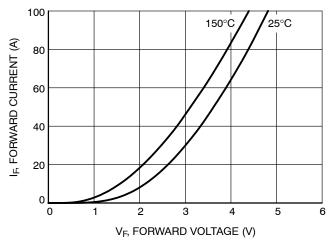


Figure 33. Diode Forward Characteristic

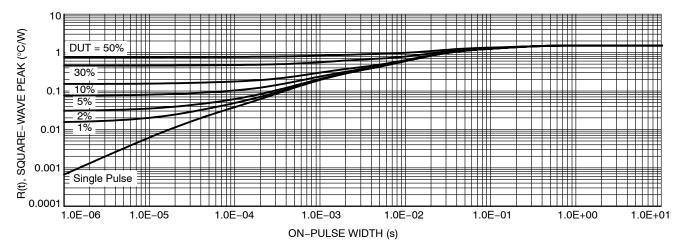


Figure 34. Diode Transient Thermal Impedance

TYPICAL CHARACTERISTICS - Neutral Point IGBT Protection Diode

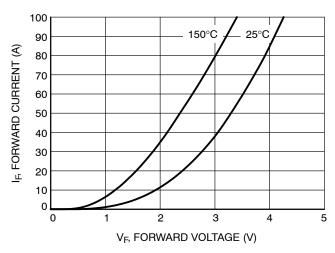


Figure 35. Diode Forward Characteristic

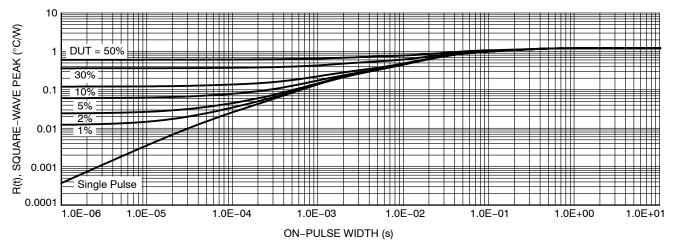


Figure 36. Diode Transient Thermal Impedance

TYPICAL CHARACTERISTICS - Thermistor

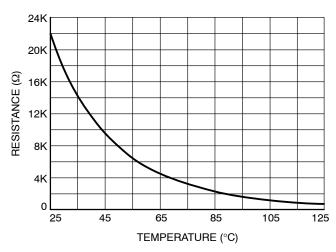
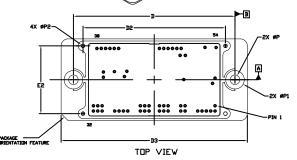


Figure 37. Thermistor Characteristics





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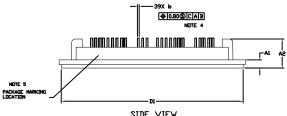


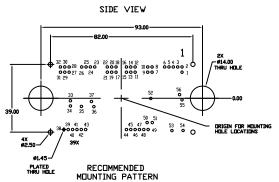


NOTES

- DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2009.
- 2. CONTROLLING DIMENSION: MILLIMETERS
- DIMENSIONS 6 APPLIES TO THE PLATED TERMINALS AND IS MEASURED BETWEEN 1.00 AND 3.00 FROM THE TERMINAL TIP.
- POSITION OF THE CENTER OF THE TERMINALS IS DETERMINED FROM DATUM B THE CENTER UF DIMENSION D, X DIRECTION, AND FROM DATUM A, Y DIRECTION, POSITIONAL TOLERANCE, AS NOTED IN DRAVING, APPLIES TO EACH TERMINAL IN BOTH DIRECTIONS.
- PACKAGE MARKING IS LOCATED AS SHOWN ON THE SIDE WITH THE PACKAGE ORIENTATION FEATURE.

	MILLIMETERS						
DIM	MIN.	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					
DS	81.80	82.20					
D3	106.90	107.50					
Ε	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					

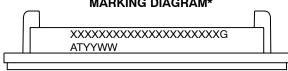




NOTE 4 MOUNTING									OSITION
	PIN P	ISITION		PIN POSITION				PIN PI	ADITIZE
PIN	х	Y	PIN	X	Y		PIN	X	Y

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

GENERIC MARKING DIAGRAM*



XXXXX = Specific Device Code

= Pb-Free Package

= Assembly & Test Site Code AT

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.

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