3-Level DCDC Converter Module

NXH300K65L4Q2F2STNG, NXH300K65L4Q2F2SNG

The NXH300K65L4Q2F2 is a power module in Q2 containing a DCDC converter. 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. NXH300K65L4Q2F2STNG is Pre-applied Thermal Interface Material (TIM) module.

Features

- Three-level DCDC Converter Module
- 650 V Field Stop 4 IGBTs
- Low Inductive layout
- Solder Pins
- Integrated NTC Thermistor
- Option with Pre-Applied Thermal Interface Material (TIM) and without Pre-Applied TIM
- This Device is Pb-Free, Halide Free and is RoHS Compliant

Typical Applications

- Uninterruptible Power Supply
- Energy Storage System
- Solar Inverters

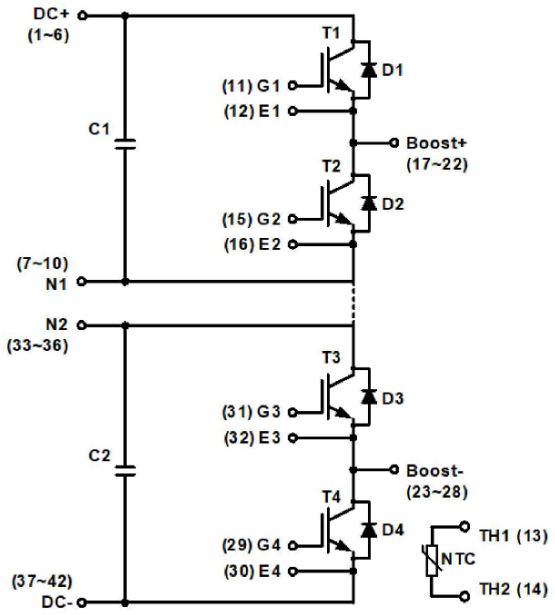
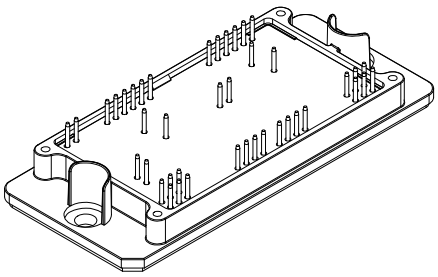
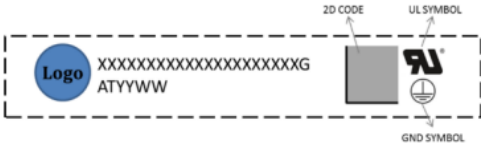


Figure 1. Schematic Diagram



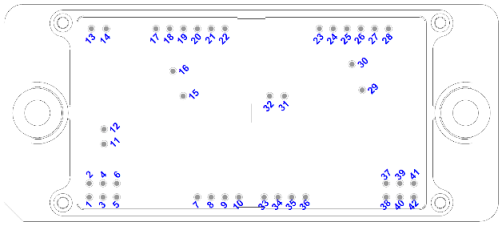
PIM-42 93x47 (SOLDER PIN)
CASE 180JD

MARKING DIAGRAM



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

PIN CONNECTIONS



ORDERING INFORMATION

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

© Semiconductor Components Industries, LLC, 2026

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 = 60 s, 50 Hz	V_{is}	4000	V_{RMS}
Stray Inductance	L_{sCE}	15	nH
Baseplate Mounting Torque (M5, Screw)	M	3−5	Nm
Weight without TIM	G	177	g
Creepage Distance (Terminal to Heatsink)		12.7	mm
Creepage Distance (Terminal to Terminal)		6.2	mm
Clearance Distance (Terminal to Heatsink)		12.7	mm
Clearance Distance (Terminal to Terminal)		6.2	mm
Comparative Tracking Index	CTI	>600	

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

Parameter	Symbol	Value	Unit
OUTER IGBTs (T1, T4)			
Collector-Emitter Voltage	V_{CES}	650	V
Gate-Emitter Voltage Positive Transient Gate-emitter Voltage (T_{pulse} = 5 μs, D < 0.10)	V_{GE}	±20 30	V
Continuous Collector Current @ T_C = 80 °C	I_C	112	A
Pulsed Peak Collector Current @ T_C = 80 °C (Tv_j = 175 °C), T_{pulse} = 1 ms	I_{Cpulse}	460	A
Power Dissipation @ T_C = 80 °C (Tv_j = 175 °C)	P_{tot}	193	W
Minimum Operating Junction Temperature	T_{JMIN}	−40	°C
Maximum Operating Junction Temperature	T_{JMAX}	150	°C
OUTER DIODES (D1, D4)			
Peak Repetitive Reverse Voltage	V_{RRM}	650	V
Continuous Forward Current @ T_C = 80 °C	I_F	267	A
Repetitive Peak Forward Current @ T_C = 80 °C (Tv_j = 175 °C), T_{pulse} = 1 ms	I_{FRM}	1344	A
Power Dissipation @ T_C = 80 °C (Tv_j = 175 °C)	P_{tot}	515	W
Minimum Operating Junction Temperature	T_{JMIN}	−40	°C
Maximum Operating Junction Temperature	T_{JMAX}	150	°C
INNER IGBTs (T2, T3)			
Collector-Emitter Voltage	V_{CES}	650	V
Gate-Emitter Voltage Positive Transient Gate-emitter Voltage (T_{pulse} = 5 μs, D < 0.10)	V_{GE}	±20 30	V
Continuous Collector Current @ T_C = 80 °C	I_C	204	A
Pulsed Peak Collector Current @ T_C = 80 °C (Tv_j = 150 °C), T_{pulse} = 1 ms	I_{Cpulse}	864	A
Power Dissipation @ T_C = 80 °C (Tv_j = 175 °C)	P_{tot}	348	W
Minimum Operating Junction Temperature	T_{JMIN}	−40	°C
Maximum Operating Junction Temperature	T_{JMAX}	150	°C
INNER DIODES (D2, D3)			
Peak Repetitive Reverse Voltage	V_{RRM}	650	V
Continuous Forward Current @ T_C = 80 °C	I_F	104	A
Repetitive Peak Forward Current @ T_C = 80 °C (Tv_j = 175 °C), T_{pulse} = 1 ms	I_{FRM}	485	A

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

Parameter	Symbol	Value	Unit
INNER DIODES (D2, D3)			
Power Dissipation @ T_C = 80 °C (Tv_j = 175 °C)	P_{tot}	201	W
Minimum Operating Junction Temperature	T_{JMIN}	−40	°C
Maximum Operating Junction Temperature	T_{JMAX}	150	°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.

1. Refer to ELECTRICAL CHARACTERISTICS, RECOMMENDED OPERATING RANGES and/or APPLICATION INFORMATION for Safe Operating parameters.
2. For optimum lifetime and reliability, **onsemi** recommends continuous V_{CE} (Half DC link voltage) operating conditions do not exceed 80% of the maximum ratings.

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

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
OUTER IGBTs (T1, T4)						
Collector-Emitter Cutoff Current	V_{GE} = 0 V, V_{CE} = 650 V	I_{CES}			500	μA
Collector-Emitter Saturation Voltage	V_{GE} = 15 V, I_C = 150 A, Tv_j = 25 °C	$V_{CE(sat)}$		1.50	2.1	V
	V_{GE} = 15 V, I_C = 150 A, Tv_j = 150 °C			1.75		
Gate-Emitter Threshold Voltage	V_{GE} = V_{CE}, I_C = 150 mA	$V_{GE(TH)}$	3.5	4.7	5.4	V
Gate Leakage Current	V_{GE} = ±20 V, V_{CE} = 0 V	I_{GES}			400	nA
Internal Gate Resistor	F = 1 MHz	R_{GINT}		1.5		Ω
Turn-off safe operating area	V_{CC} = 430 V, Vce < 650 V at chip level, Tv_j < 150 °C				300	A
Turn-on Delay Time	Tv_j = 25 °C V_{CE} = 430 V, I_C = 50 A V_{GE} = 15/−9 V, R_G = 18 Ω	$t_{d(on)}$		150		ns
Rise Time		t_r		35.06		
Turn-off Delay Time		$t_{d(off)}$		347.7		
Fall Time		t_f		1.07		
Turn-on Switching Loss per Pulse		E_{ON}		0.5		mJ
Turn off Switching Loss per Pulse		E_{OFF}		1.23		
Turn-on Delay Time	Tv_j = 150 °C V_{CE} = 430 V, I_C = 50 A V_{GE} = 15/−9 V, R_G = 18 Ω	$t_{d(on)}$		130		ns
Rise Time		t_r		28.48		
Turn-off Delay Time		$t_{d(off)}$		369.5		
Fall Time		t_f		5.86		
Turn-on Switching Loss per Pulse		E_{ON}		0.8		mJ
Turn off Switching Loss per Pulse		E_{OFF}		1.7		
Total Gate Charge	V_{CE} = 400 V, V_{GE} = −15/20 V, I_C = 150 A	$Q_{G(TOTAL)}$		656		nC
Gate-Source Charge		Q_{GE}		54.4		
Gate-Drain Charge		Q_{GC}		68.8		
Input Capacitance	V_{CE} = 20 V, V_{GE} = 0 V, f = 100 kHz	C_{IES}		9040.3		pF
Output Capacitance		C_{OES}		10779.2		
Reverse Transfer Capacitance		C_{RES}		30.9		
Thermal Resistance – Chip-to-heatsink	Thermal grease, Thickness = 100 μm Thermal conductivity= 2.87 W/mK	R_{thJH}		0.463		°C/W
Thermal Resistance – Chip-to-case		R_{thJC}		0.363		°C/W

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

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
INNER DIODES (D2, D3)						
Diode Forward Voltage	I_F = 100 A, Tv_j = 25 °C	V_F		2.25	2.99	V
	I_F = 100 A, Tv_j = 150 °C			1.85		
Reverse Recovery Time	Tv_j = 25 °C V_{CE} = 430 V, I_F = 50 A V_{GE} = 15/−9 V, R_G = 18 Ω	t_{rr}		122.6		ns
Reverse Recovery Charge		Q_{rr}		4081.25		nC
Peak Reverse Recovery Current		I_{RRM}		51.53		A
Peak Rate of Fall of Recovery Current		di/dt		1428.4		A/μs
Reverse Recovery Energy		E_{rr}		1.69		mJ
Reverse Recovery Time	Tv_j = 150 °C V_{CE} = 430 V, I_F = 50 A V_{GE} = 15/−9 V, R_G = 18 Ω	t_{rr}		126.8		ns
Reverse Recovery Charge		Q_{rr}		8038.93		nC
Peak Reverse Recovery Current		I_{RRM}		101.53		A
Peak Rate of Fall of Recovery Current		di/dt		1388.5		A/μs
Reverse Recovery Energy		E_{rr}		3.23		mJ
Surge Forward Current	t_p = 10 ms, Tv_j = 150 °C	I_{FSM}		713.49		A
I^2t	t_p = 10 ms, Tv_j = 150 °C	I^2t		2545.34		A^2s
Thermal Resistance – Chip-to-heatsink	Thermal grease, Thickness = 100 μm Thermal conductivity= 2.87 W/mK	R_{thJH}		0.454		°C/W
Thermal Resistance – Chip-to-case		R_{thJC}		0.349		°C/W
INNER IGBTs (T2, T3)						
Collector-Emitter Cutoff Current	V_{GE} = 0 V, V_{CE} = 650 V	I_{CES}			500	μA
Collector-Emitter Saturation Voltage	V_{GE} = 15 V, I_C = 300 A, Tv_j = 25 °C	$V_{CE(sat)}$		1.50	2.1	V
	V_{GE} = 15 V, I_C = 300 A, Tv_j = 150 °C			1.75		
Gate-Emitter Threshold Voltage	V_{GE} = V_{CE}, I_C = 300 mA	$V_{GE(TH)}$	3.5	4.7	5.4	V
Gate Leakage Current	V_{GE} = ±20 V, V_{CE} = 0 V	I_{GES}			800	nA
Internal Gate Resistor	F = 1 MHz	R_{GINT}		0.75		Ω
Turn-off safe operating area	V_{CC} = 430 V, Vce < 650 V at chip level, Tv_j < 150 °C				600	A
Turn-on Delay Time	Tv_j = 25 °C V_{CE} = 430 V, I_C = 150 A V_{GE} = 15/−9 V, R_G = 18 Ω	$t_{d(on)}$		235		ns
Rise Time		t_r		42.26		
Turn-off Delay Time		$t_{d(off)}$		577.32		
Fall Time		t_f		22.32		
Turn-on Switching Loss per Pulse		E_{ON}		4.33		mJ
Turn off Switching Loss per Pulse		E_{OFF}		3.93		
Turn-on Delay Time	Tv_j = 150 °C V_{CE} = 430 V, I_C = 150 A V_{GE} = 15/−9 V, R_G = 18 Ω	$t_{d(on)}$		226.14		ns
Rise Time		t_r		54.99		
Turn-off Delay Time		$t_{d(off)}$		632.02		
Fall Time		t_f		17.56		
Turn-on Switching Loss per Pulse		E_{ON}		6.54		mJ
Turn off Switching Loss per Pulse		E_{OFF}		5.02		
Total Gate Charge	V_{CE} = 400 V, V_{GE} = −15/20 V, I_C = 300 A	$Q_{G(TOTAL)}$		1280		nC
Gate-Source Charge		Q_{GE}		80		
Gate-Drain Charge		Q_{GC}		184		

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

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
INNER IGBTs (T2, T3)						
Input Capacitance	V_{CE} = 20 V, V_{GE} = 0 V, f = 1 MHz	C_{IES}		17967.7		pF
Output Capacitance		C_{OES}		10143.1		
Reverse Transfer Capacitance		C_{RES}		58.67		
Thermal Resistance – Chip-to-heatsink	Thermal grease, Thickness = 100 μm Thermal conductivity = 2.87 W/mK	R_{thJH}		0.276		°C/W
Thermal Resistance – Chip-to-case		R_{thJC}		0.201		°C/W
OUTER DIODEs (D1, D4)						
Diode Forward Voltage	I_F = 300 A, Tv_j = 25 °C	V_F		2.25	2.99	V
	I_F = 300 A, Tv_j = 150 °C			1.83		
Reverse Recovery Time	Tv_j = 25 °C V_{CE} = 430 V, I_F = 150 A V_{GE} = 15/−9 V, R_G = 18 Ω	t_{rr}		117.28		ns
Reverse Recovery Charge		Q_{rr}		9957.42		nC
Peak Reverse Recovery Current		I_{RRM}		134.06		A
Peak Rate of Fall of Recovery Current		di/dt		2719.56		A/μs
Reverse Recovery Energy		E_{rr}		3.54		mJ
Reverse Recovery Time	Tv_j = 150 °C V_{CE} = 430 V, I_F = 150 A V_{GE} = 15/−9 V, R_G = 18 Ω	t_{rr}		135.79		ns
Reverse Recovery Charge		Q_{rr}		18764.85		nC
Peak Reverse Recovery Current		I_{RRM}		201.32		A
Peak Rate of Fall of Recovery Current		di/dt		2369.64		A/μs
Reverse Recovery Energy		E_{rr}		6.02		mJ
Surge Forward Current	t_p = 10 ms, Tv_j = 150 °C	I_{FSM}			1000	A
I^2t	t_p = 10 ms, Tv_j = 150 °C	I^2t			5000	A^2s
Thermal Resistance – Chip-to-heatsink	Thermal grease, Thickness = 100 μm Thermal conductivity= 2.87 W/mK	R_{thJH}		0.208		°C/W
Thermal Resistance – Chip-to-case		R_{thJC}		0.136		°C/W
SNUBBER CAPACITORS (C1, C2)						
Rated blocking voltage					630	V
Nominal Capacitance		C		66		nF
THERMISTOR CHARACTERISTICS						
Nominal Resistance	T_{NTC} = 25 °C	R_{25}		22		kΩ
Nominal Resistance	T_{NTC} = 100 °C	R_{100}		1504		Ω
Deviation of R25		R/R	−1		1	%
Power Dissipation		P_D		187.5		mW
Power Dissipation Constant				1.5		mW/K
B-value	B(25/100), tolerance ±3%			3980		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
NXH300K65L4Q2F2STNG	NXH300K65L4Q2F2STNG	Q2 – PIM-42 93x47 (Solder PIN) (Pb-Free and Halide-Free)	12 Units / Blister Tray
NXH300K65L4Q2F2SNG	NXH300K65L4Q2F2SNG	Q2 – PIM-42 93x47 (Solder PIN) (Pb-Free and Halide-Free)	12 Units / Blister Tray

TYPICAL CHARACTERISTICS – T1, T4 (OUTER IGBTs)

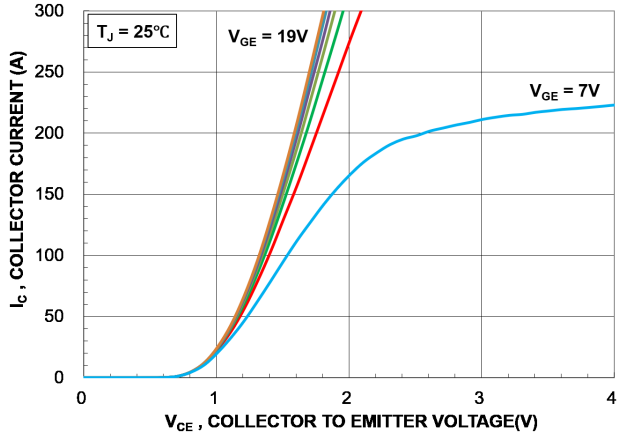


Figure 2. Typical Output Characteristics – IGBT

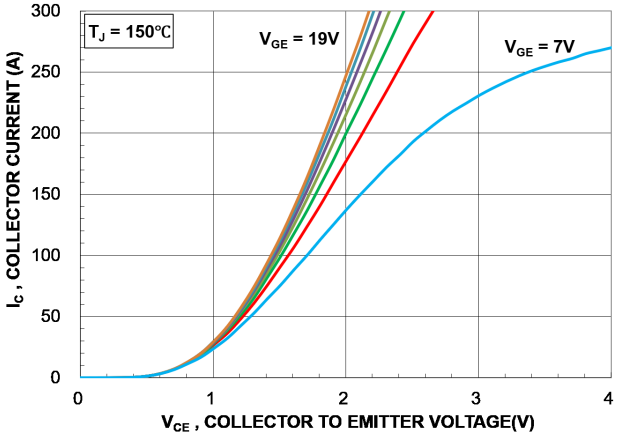


Figure 3. Typical Output Characteristics – IGBT

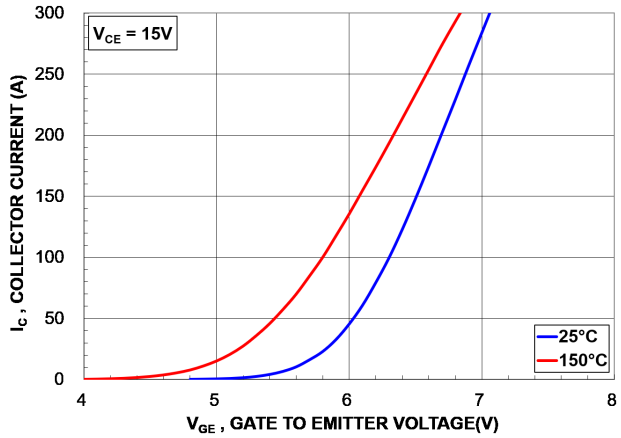


Figure 4. Transfer Characteristics – IGBT

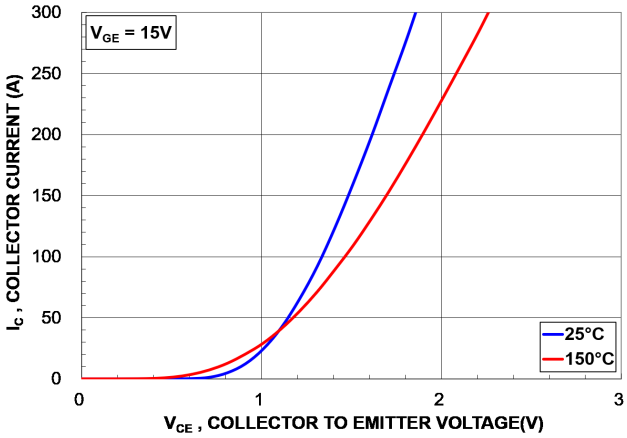


Figure 5. Saturation Voltage Characteristic – IGBT

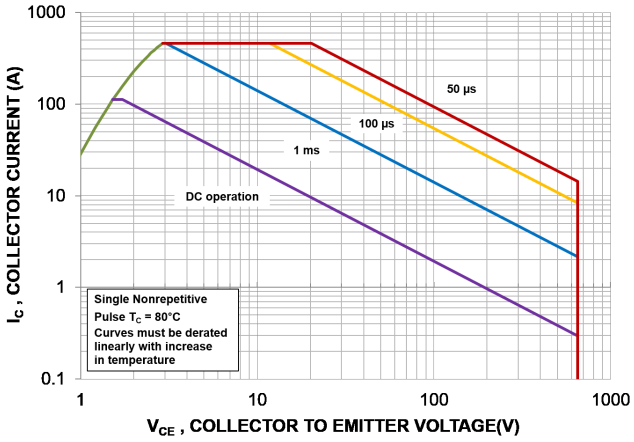


Figure 6. FBSOA

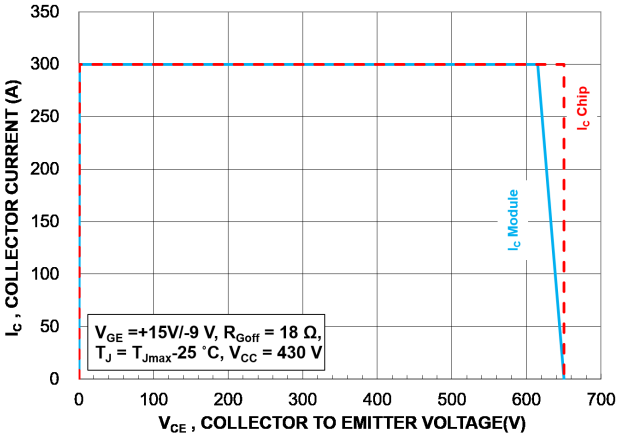


Figure 7. RBSOA

TYPICAL CHARACTERISTICS – T1, T4 (OUTER IGBTs)

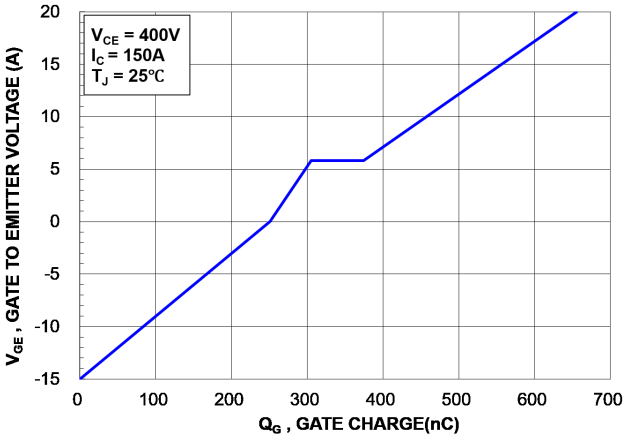


Figure 8. Gate Charge Characteristic

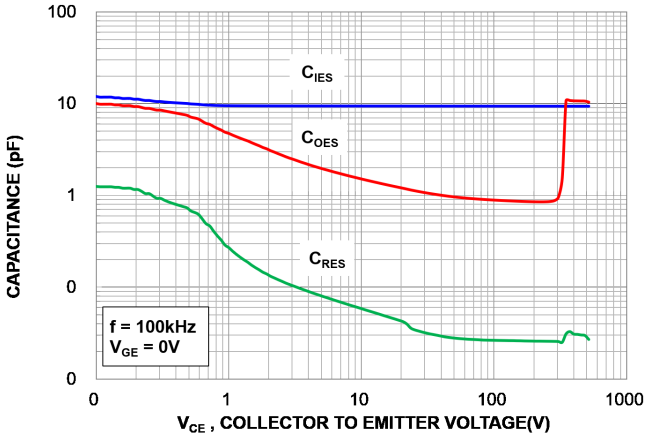


Figure 9. Capacitance Characteristics

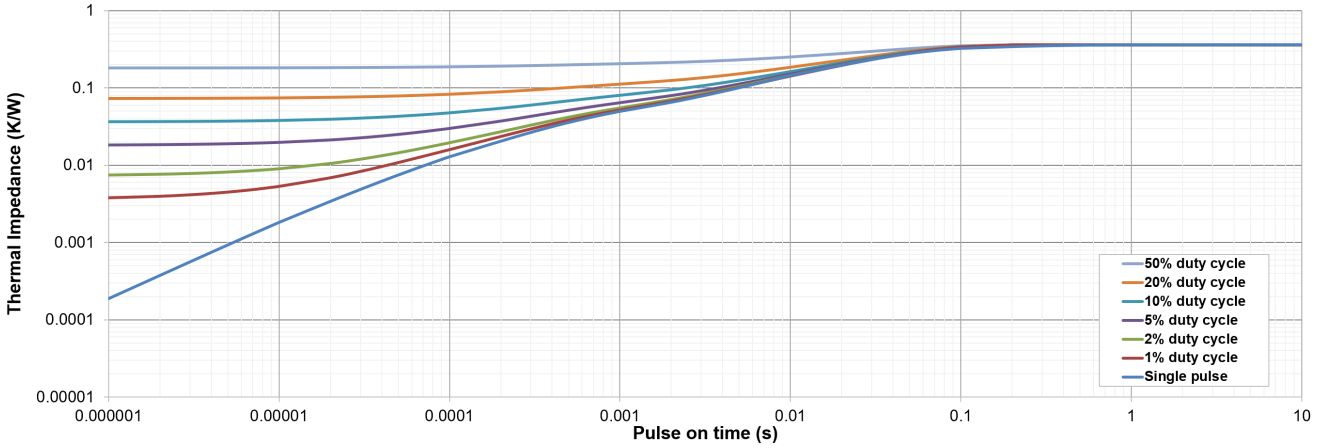


Figure 10. Transient Thermal Impedance (IGBT Zthjc)

TYPICAL CHARACTERISTICS – D2, D3 (INNER DIODES)

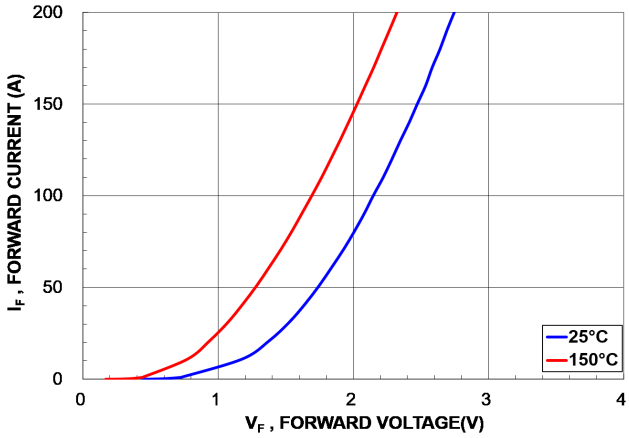


Figure 11. Diode Forward Characteristics

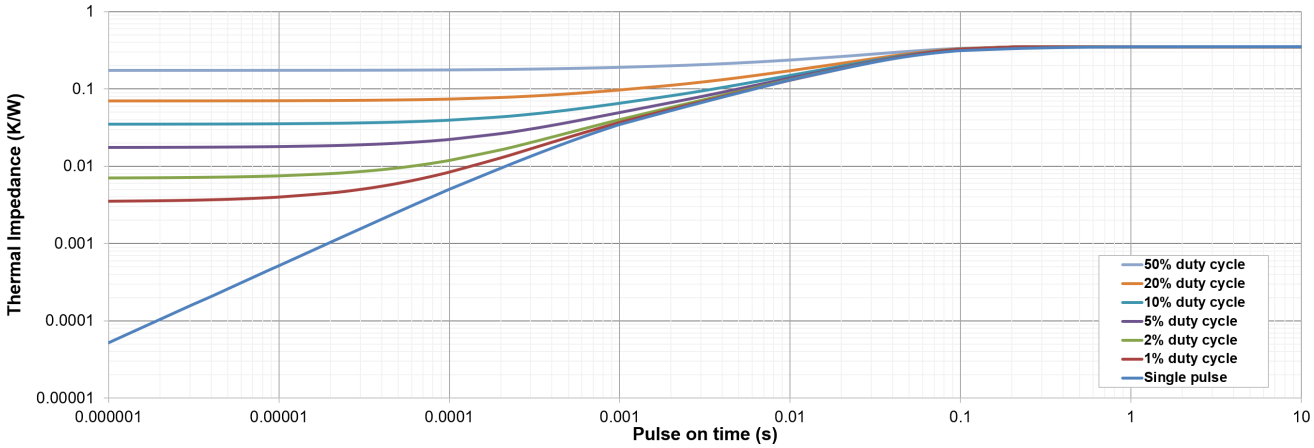


Figure 12. Transient Thermal Impedance (Diode Zthjc)

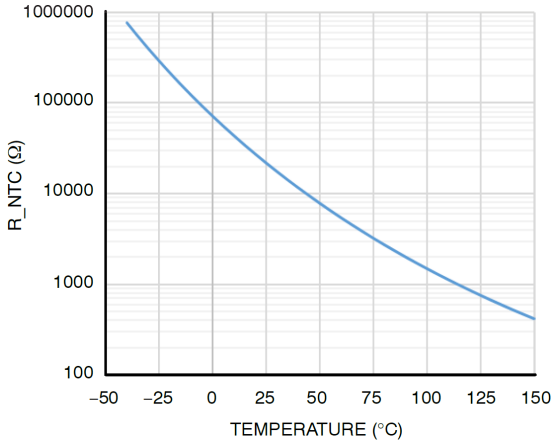


Figure 13. Temperature vs. NTC Value

TYPICAL CHARACTERISTICS – T2, T3 (INNER IGBTs)

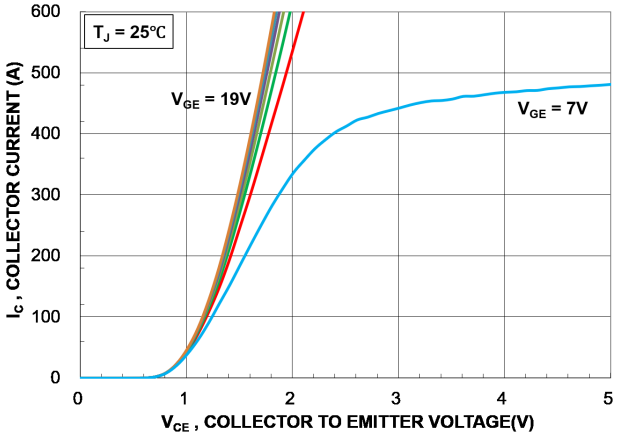


Figure 14. Typical Output Characteristics – IGBT

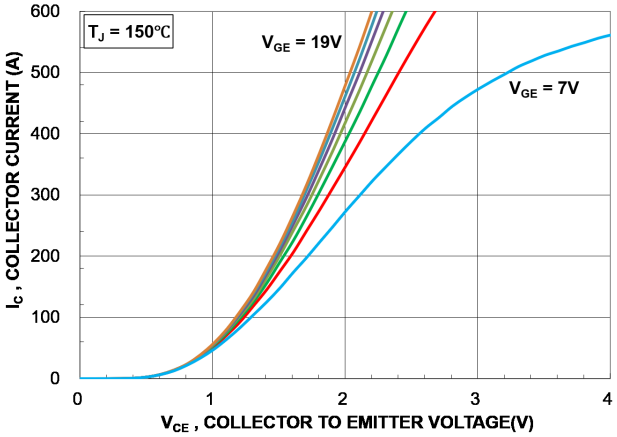


Figure 15. Typical Output Characteristics – IGBT

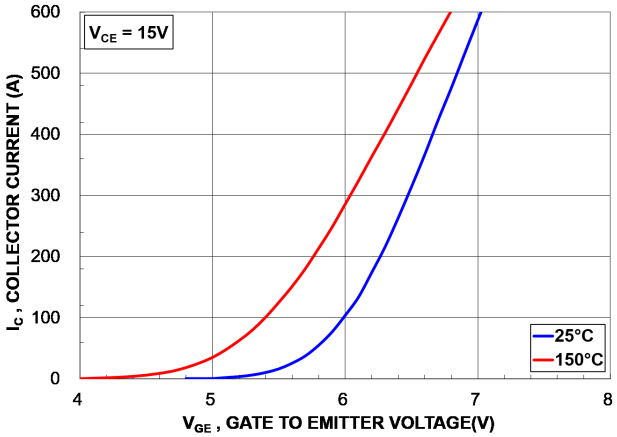


Figure 16. Transfer Characteristics – IGBT

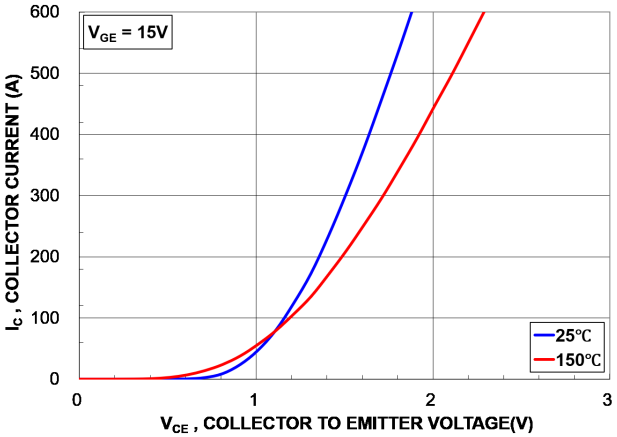


Figure 17. Saturation Voltage Characteristic – IGBT

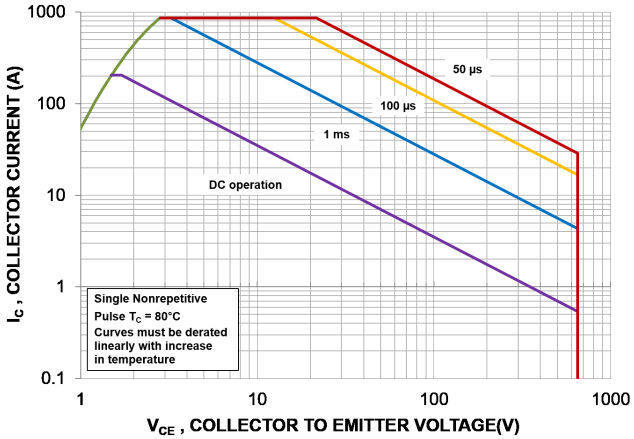


Figure 18. FBSOA

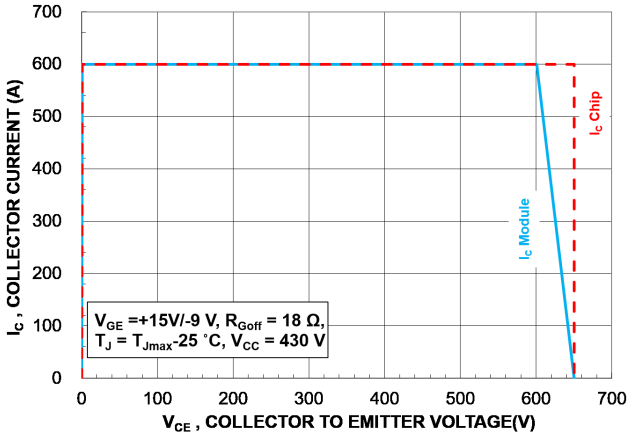


Figure 19. RBSOA

TYPICAL CHARACTERISTICS – T2, T3 (INNER IGBTs)

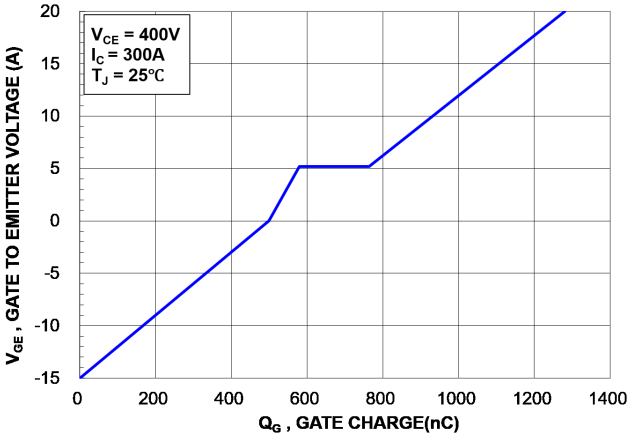


Figure 20. Gate Charge Characteristic

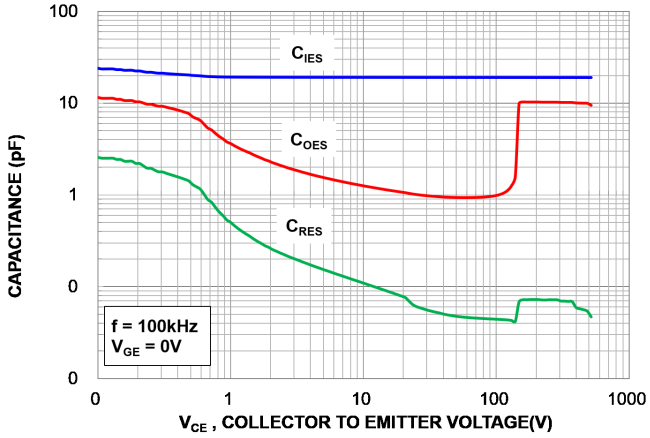


Figure 21. Capacitance Characteristics

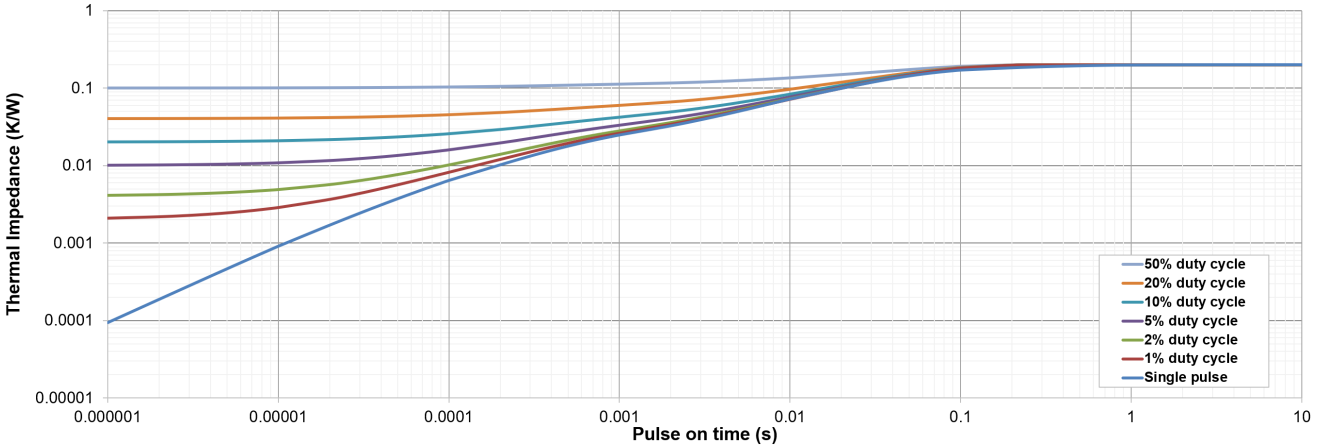


Figure 22. Transient Thermal Impedance
(IGBT Zthjc)

TYPICAL CHARACTERISTICS – D1, D4 (OUTER DIODES)

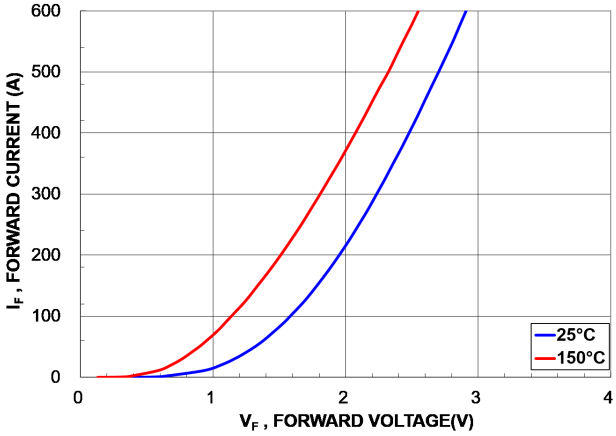


Figure 23. Diode Forward Characteristics

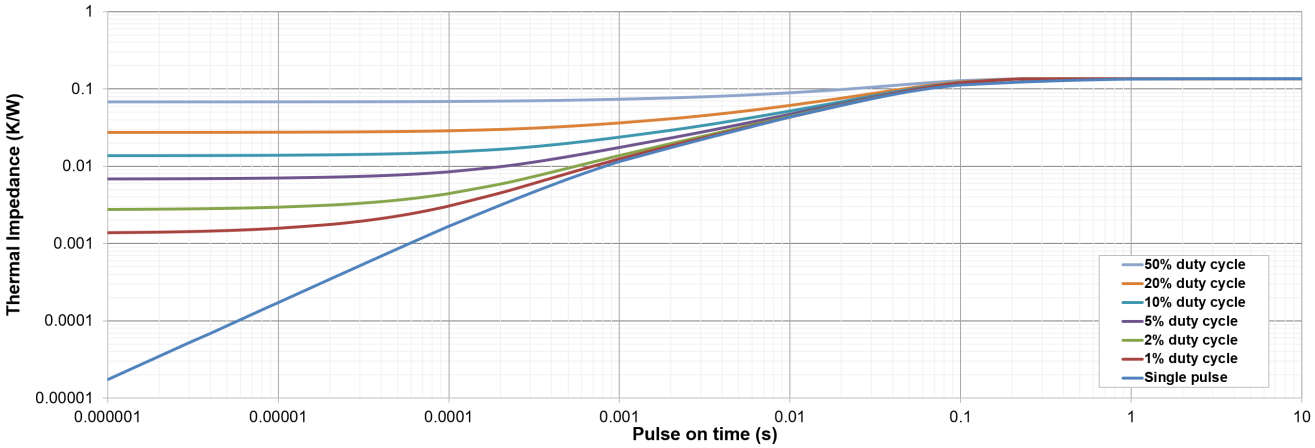


Figure 24. Transient Thermal Impedance (Diode Zthjc)

TYPICAL CHARACTERISTICS – T1 || D2 OR T4 || D3

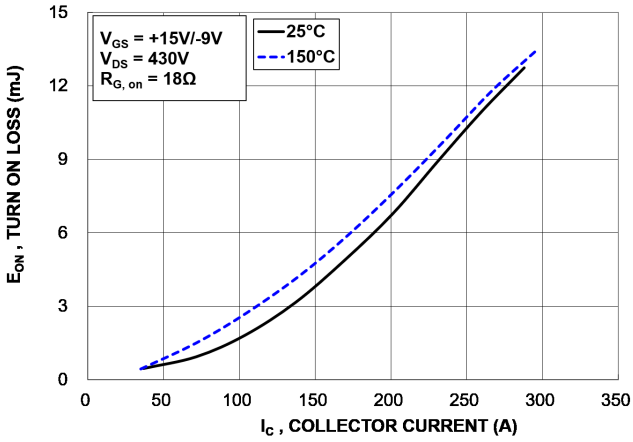


Figure 25. Typical Switching Turn On Loss vs. Collector Current

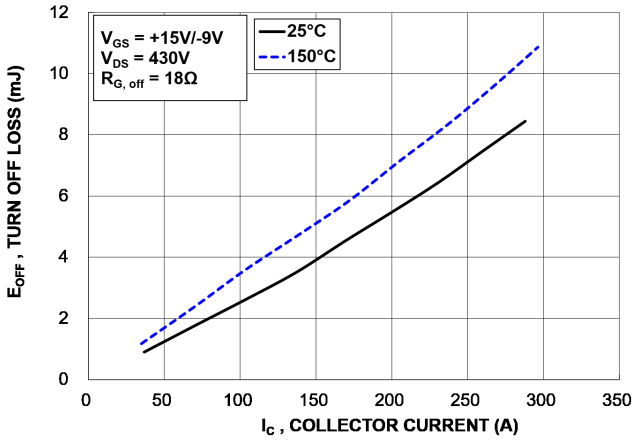


Figure 26. Typical Switching Turn Off Loss vs. Collector Current

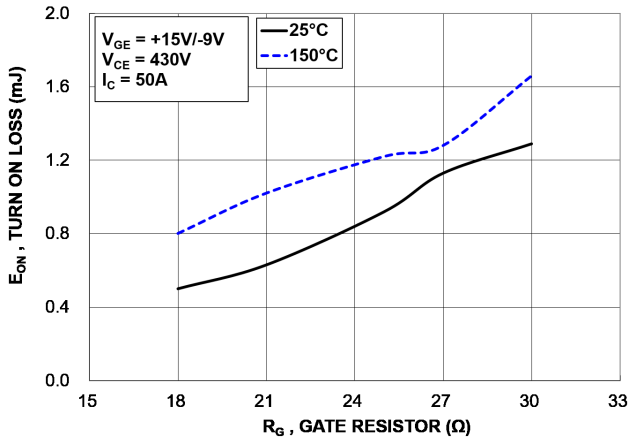


Figure 27. Typical Switching Turn On Loss vs. Gate Resistance

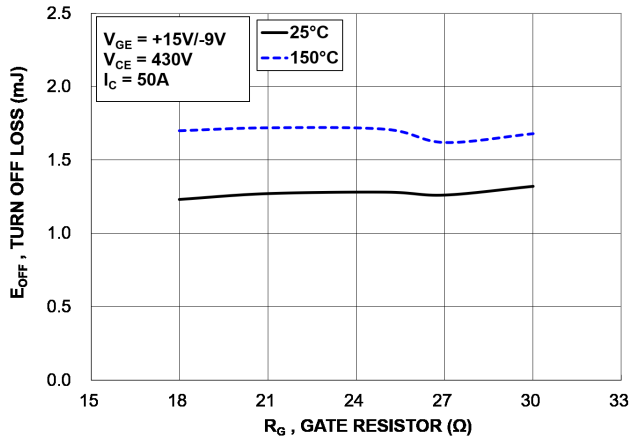


Figure 28. Typical Switching Turn Off Loss vs. Gate Resistance

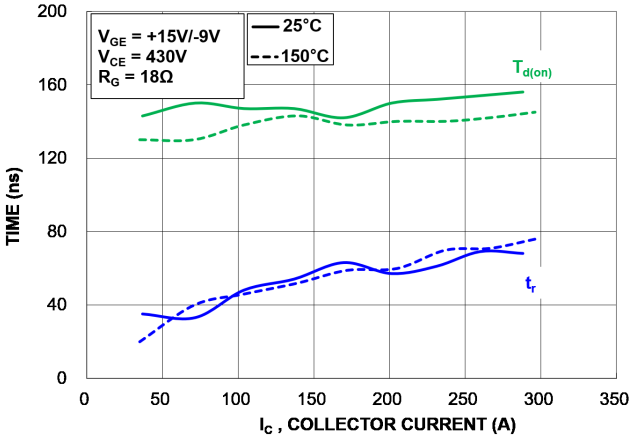


Figure 29. Typical Turn On Switching Time vs. Collector Current

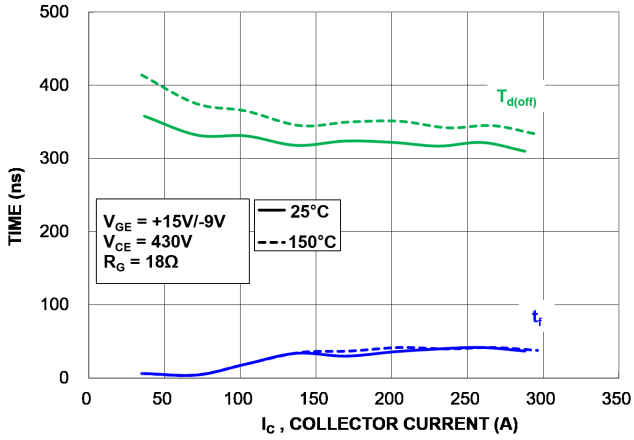


Figure 30. Typical Turn Off Switching Time vs. Collector Current

TYPICAL CHARACTERISTICS – T1 || D2 OR T4 || D3

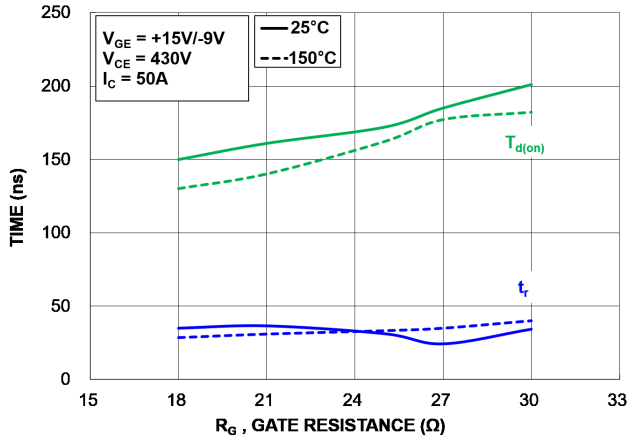


Figure 31. Typical Turn On Switching Time vs. Gate Resistance

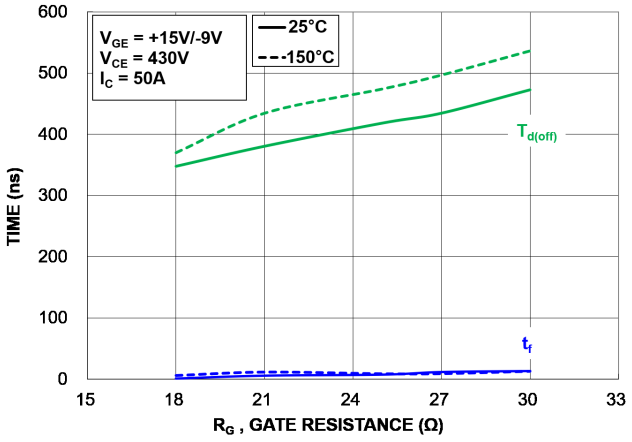


Figure 32. Typical Turn Off Switching Time vs. Gate Resistance

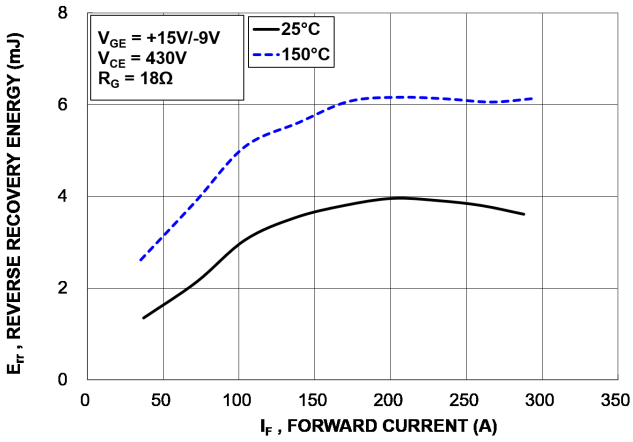


Figure 33. Typical Reverse Recovery Energy vs. Forward Current

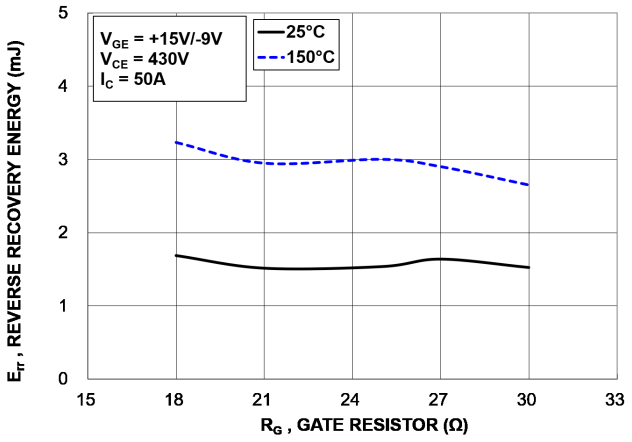


Figure 34. Typical Reverse Recovery Energy vs. Gate Resistance

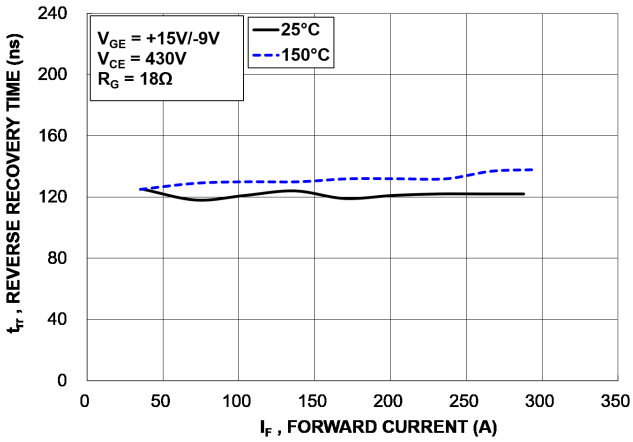


Figure 35. Typical Reverse Recovery Time vs. Forward Current

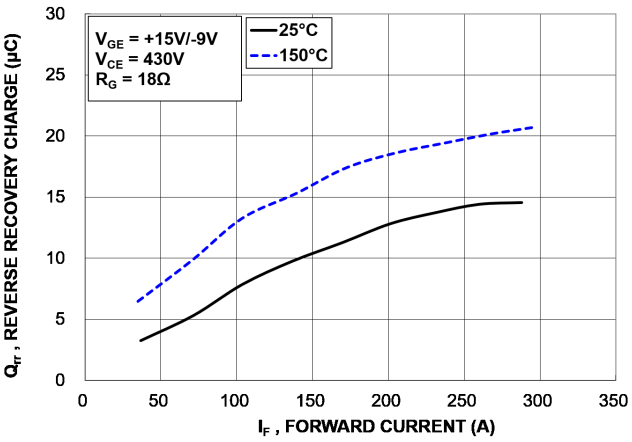


Figure 36. Typical Reverse Recovery Charge vs. Forward Current

TYPICAL CHARACTERISTICS – T2 || D1 OR T3 || D4

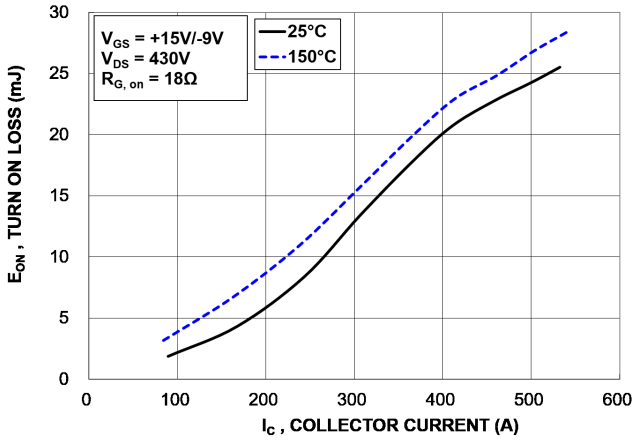


Figure 37. Typical Switching Turn On Loss vs. Collector Current

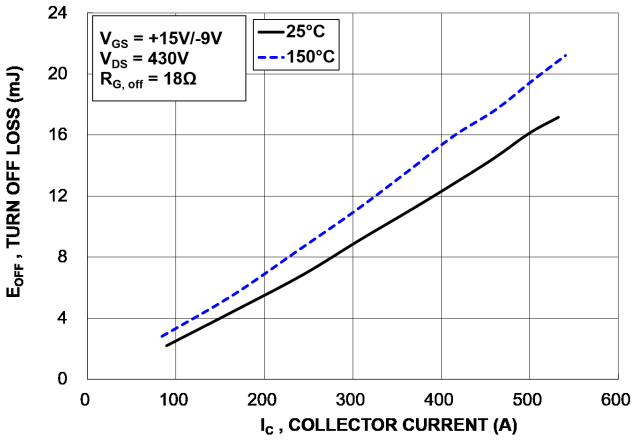


Figure 38. Typical Switching Turn Off Loss vs. Collector Current

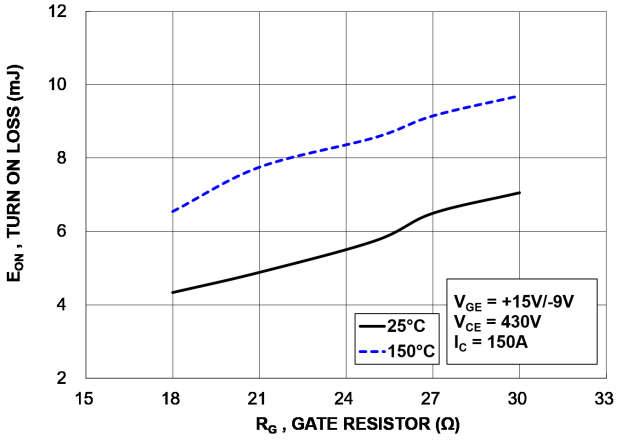


Figure 39. Typical Switching Turn On Loss vs. Gate Resistance

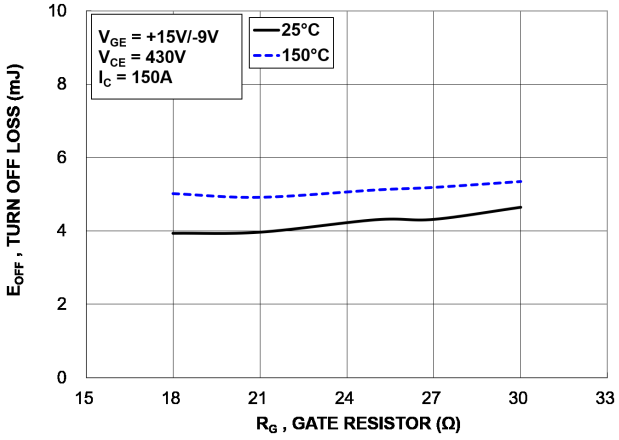


Figure 40. Typical Switching Turn Off Loss vs. Gate Resistance

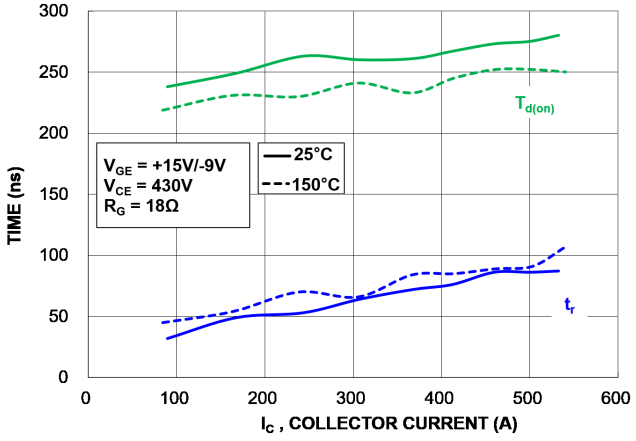


Figure 41. Typical Turn On Switching Time vs. Collector Current

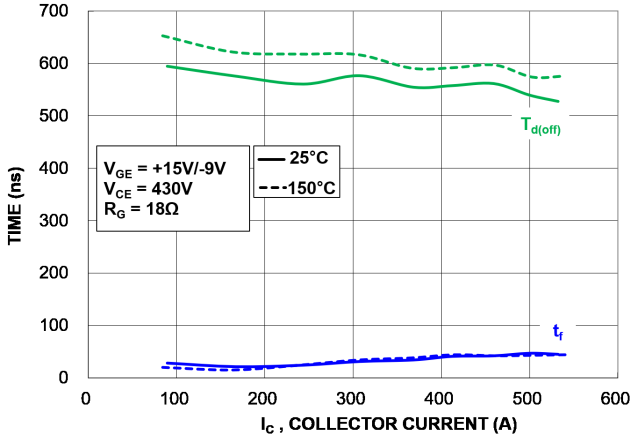


Figure 42. Typical Turn Off Switching Time vs. Collector Current

TYPICAL CHARACTERISTICS – T2 || D1 OR T3 || D4

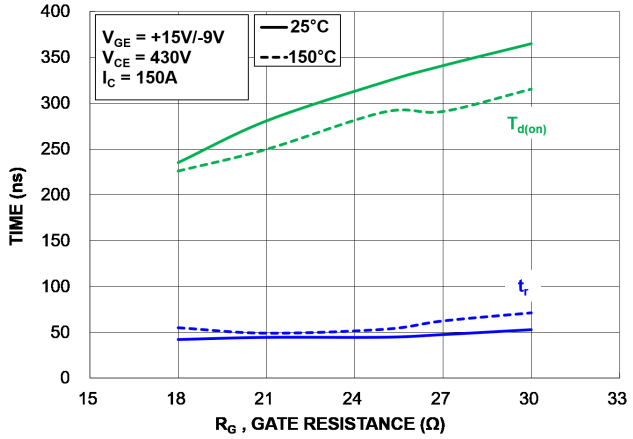


Figure 43. Typical Turn On Switching Time vs. Gate Resistance

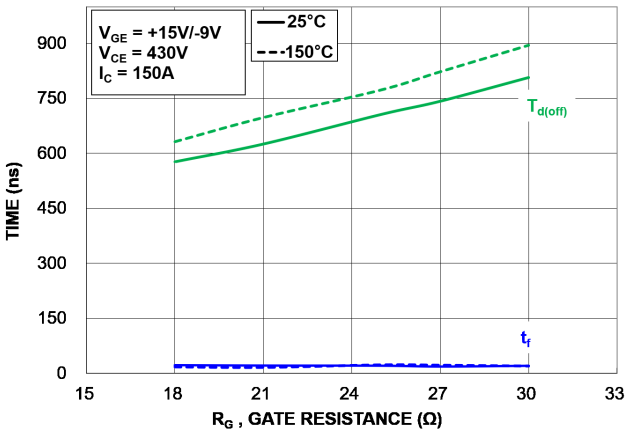


Figure 44. Typical Turn Off Switching Time vs. Gate Resistance

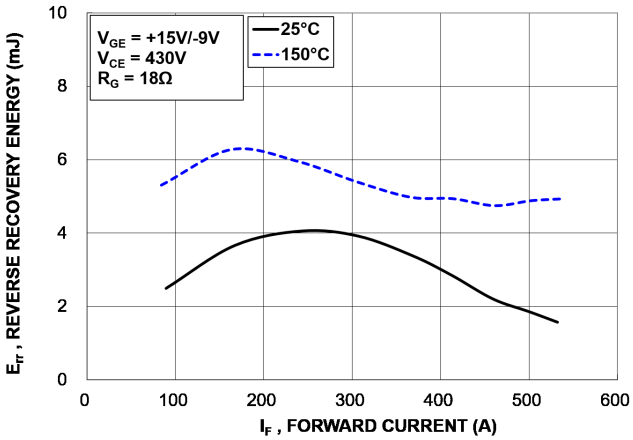


Figure 45. Typical Reverse Recovery Energy vs. Forward Current

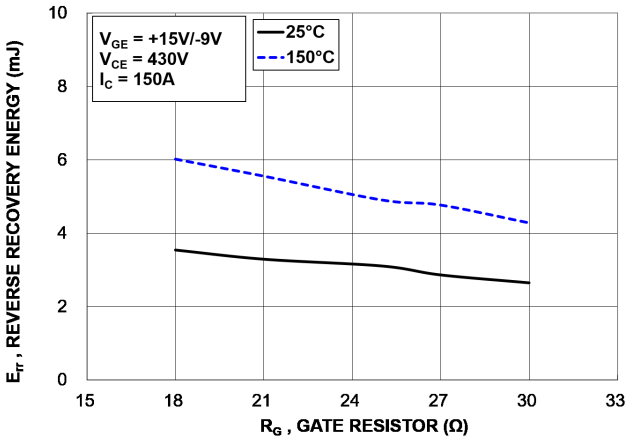


Figure 46. Typical Reverse Recovery Energy vs. Gate Resistance

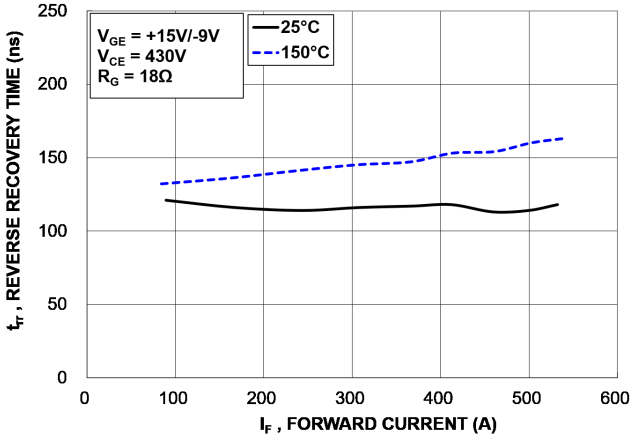


Figure 47. Typical Reverse Recovery Time vs. Forward Current

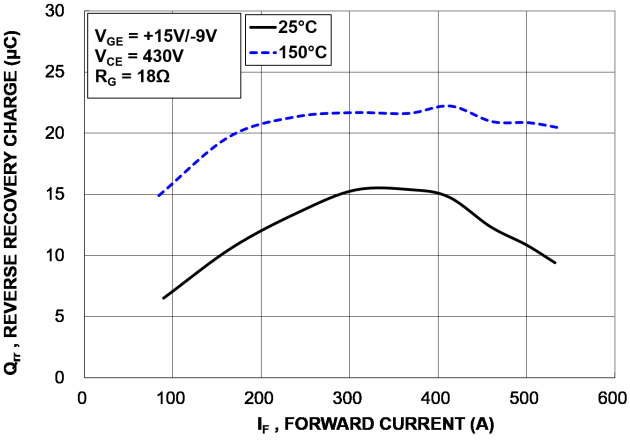
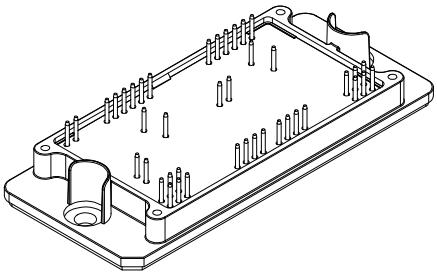


Figure 48. Typical Reverse Recovery Charge vs. Forward Current

REVISION HISTORY

Revision	Description of Changes	Date
0	Initial document release.	9/18/2026
0	Add a sentence to page 1.	10/16/2026

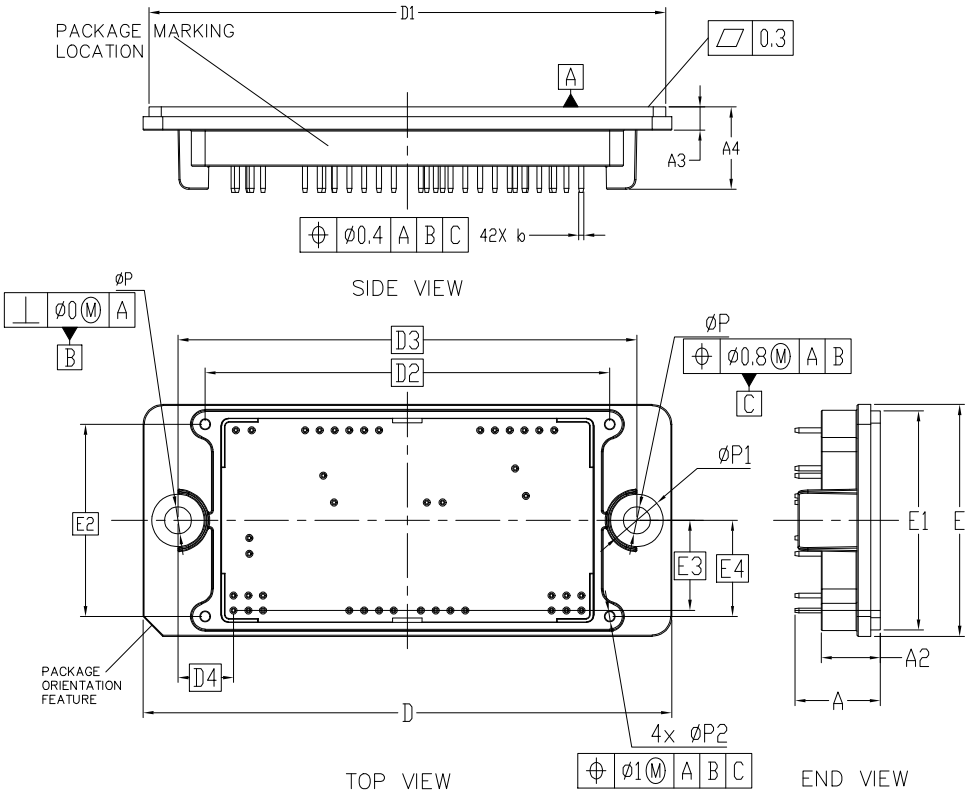
PACKAGE DIMENSIONS



PIM−42 93.00x47.00x12.00
CASE 180JD
ISSUE O

DATE 21 APR 2026

NOTES:
1. DIMENSIONING AND TOLERANCING CONFORM TO ASME Y14.5−2018.
2. ALL DIMENSIONS ARE IN MILLIMETERS.
3. PIN POSITION TOLERANCE IS ± 0.4MM.
4. PACKAGE MARKING IS LOCATED ON THE SIDE OPPOSITE THE PACKAGE ORIENTATION FEATURE.
5. THE PINS ARE SN−NI PLATED SOLDER PIN.

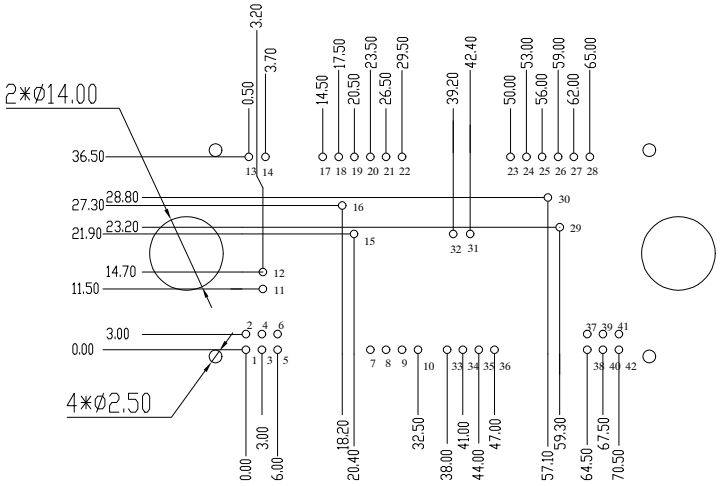


DIM	MILLIMETERS		
	MIN.	NOM.	MAX.
A	16.92	17.32	17.72
A2	11.70	12.00	12.30
A3	4.40	4.70	5.00
A4	16.40	16.70	17.00
b	0.95	1.00	1.05
D	106.90	107.20	107.50
D1	104.45	104.75	105.05
D2	82.00 BSC		
D3	93.00 BSC		
D4	11.25 BSC		
E	46.70	47.00	47.30
E1	44.10	44.40	44.70
E2	39.00 BSC		
E3	18.25 BSC		
E4	19.50 BSC		
P	5.40	5.50	5.60
P1	10.60	10.70	10.80
P2	1.80	2.00	2.20

PACKAGE DIMENSIONS

PIM−42 93.00x47.00x12.00
CASE 180JD
ISSUE O

DATE 21 APR 2026



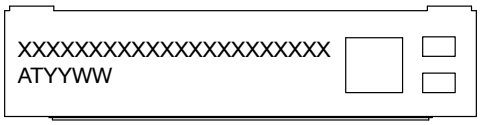
RECOMMENDED
MOUNTING PATTERN

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

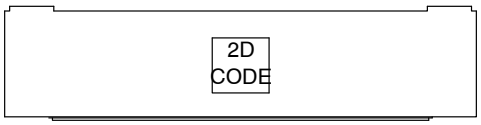
NOTE 2:

Pin Table								
Pin	X	Y	Pin	X	Y	Pin	X	Y
1	0	0	15	20.4	21.9	29	59.3	23.2
2	0	3	16	18.2	27.3	30	57.1	28.8
3	3	0	17	14.5	36.5	31	42.4	21.9
4	3	3	18	17.5	36.5	32	39.2	21.9
5	6	0	19	20.5	36.5	33	38	0
6	6	3	20	23.5	36.5	34	41	0
7	23.5	0	21	26.5	36.5	35	44	0
8	26.5	0	22	29.5	36.5	36	47	0
9	29.5	0	23	50	36.5	37	64.5	3
10	32.5	0	24	53	36.5	38	64.5	0
11	3.2	11.5	25	56	36.5	39	67.5	3
12	3.2	11.5	26	59	36.5	40	67.5	0
13	0.5	36.5	27	62	36.5	41	70.5	3
14	3.7	36.5	28	65	36.5	42	70.5	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.

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