

SNXH100M65L3Q2F2PG, SNXH100M65L4Q2F2P2G-N1

Q2PACK Module

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

Features

- Extremely Efficient Trench with Field Stop Technology
- Low Switching Loss Reduces System Power Dissipation
- Module Design Offers High Power Density
- Low Inductive Layout
- Q2PACK Package with Press-Fit Pins
- This is a Pb-Free Device

Typical Applications

- Solar Inverters
- Uninterruptable Power Supplies Systems

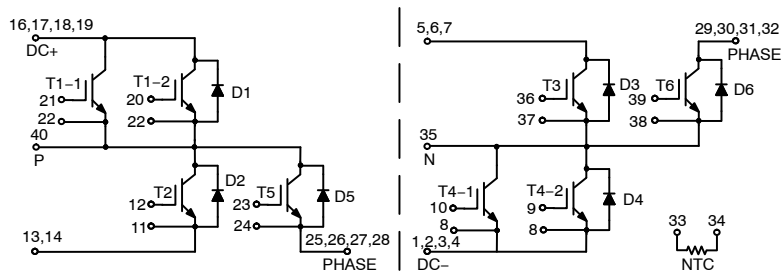


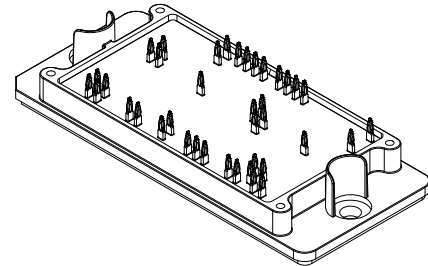
Figure 1. Schematic Diagram



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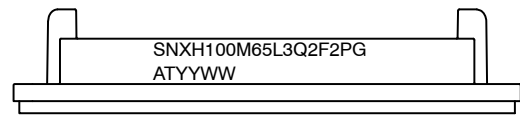
www.onsemi.com

100 A, 650 V Inverter Module



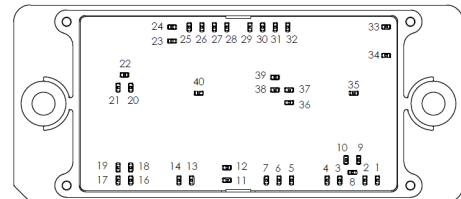
Q2PACK
CASE 180AG

DEVICE MARKING



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.

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Table 1. MAXIMUM RATINGS

Rating	Symbol	Value	Unit
IGBT (T1-1, T1-2, T4-1, T4-2)			
Collector-emitter voltage	V_{CES}	650	V
Collector current @ $T_h = 80^\circ\text{C}$	I_C	113	A
Pulsed Peak Collector Current @ $T_{\text{pulse}} = 1 \text{ ms}$	I_{CM}	339	A
Power Dissipation ($T_j = T_{j\text{max}}$ $T_h = 80^\circ\text{C}$)	P_{tot}	226	W
Gate-emitter voltage	V_{GE}	± 20	V
Positive transient gate-emitter voltage ($T_{\text{pulse}} = 5 \mu\text{s}$, $D < 0.10$)		30	
Maximum Junction Temperature (Note 1)	$T_{J\text{max}}$	175	$^\circ\text{C}$
IGBT (T2, T3)			
Collector-emitter voltage	V_{CES}	650	V
Collector current @ $T_h = 80^\circ\text{C}$ (per IGBT)	I_C	103	A
Pulsed Peak Collector Current @ $T_{\text{pulse}} = 1 \text{ ms}$	I_{CM}	309	A
Power Dissipation ($T_j = T_{j\text{max}}$ $T_h = 80^\circ\text{C}$)	P_{tot}	206	W
Gate-emitter voltage	V_{GE}	± 20	V
Positive transient gate-emitter voltage ($T_{\text{pulse}} = 5 \mu\text{s}$, $D < 0.10$)		30	
Maximum Junction Temperature (Note 2)	$T_{J\text{max}}$	175	$^\circ\text{C}$
IGBT (T5, T6)			
Collector-emitter voltage	V_{CES}	650	V
Collector current @ $T_h = 80^\circ\text{C}$ (per IGBT)	I_C	263	A
Pulsed Peak Collector Current @ $T_{\text{pulse}} = 1 \text{ ms}$	I_{CM}	789	A
Power Dissipation ($T_j = T_{j\text{max}}$ $T_h = 80^\circ\text{C}$)	P_{tot}	339	W
Gate-emitter voltage	V_{GE}	± 20	V
Positive transient gate-emitter voltage ($T_{\text{pulse}} = 5 \mu\text{s}$, $D < 0.10$)		30	
Maximum Junction Temperature (Note 1)	$T_{J\text{max}}$	175	$^\circ\text{C}$
INVERSE DIODE (D1, D4)			
Peak Repetitive Reverse Voltage	V_{RRM}	650	V
Forward Current, DC @ $T_h = 80^\circ\text{C}$	I_F	69	A
Repetitive Peak Forward Current, $T_{\text{pulse}} = 1 \text{ ms}$	I_{FRM}	207	A
Power Dissipation ($T_j = T_{J\text{MAX}}$ $T_h = 80^\circ\text{C}$)	P_{tot}	130	W
Maximum Junction Temperature (Note 2)	T_J	175	$^\circ\text{C}$
INVERSES DIODE (D2, D3, D5, D6)			
Peak Repetitive Reverse Voltage	V_{RRM}	650	V
Forward Current, DC @ $T_h = 80^\circ\text{C}$	I_F	88	A
Repetitive Peak Forward Current, $T_{\text{pulse}} = 1 \text{ ms}$	I_{FRM}	264	A
Power Dissipation ($T_j = T_{J\text{MAX}}$ $T_h = 80^\circ\text{C}$)	P_{tot}	156	W
Maximum Junction Temperature (Note 2)	T_J	175	$^\circ\text{C}$
THERMAL PROPERTIES			
Operating Temperature under switching condition	$T_{VJ\text{OP}}$	-40 to $(T_{j\text{max}}-25)$	$^\circ\text{C}$
Storage Temperature range	T_{stg}	-40 to 125	$^\circ\text{C}$
INSULATION PROPERTIES			
Isolation test voltage, $t = 1 \text{ min}$, 50/60 Hz	V_{is}	2500	V_{RMS}
Creepage distance		12.7	mm

1. Rated per discrete TO247 qualification

2. Device characterization was confirmed in T_j 175°C and HTRB test passed at T_j 150°C condition

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

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit	
IGBT (T1-1, T1-2, T4-1, T4-2)							
Collector-emitter saturation voltage (pin-to-pin)	$V_{GE} = 15\text{ V}, I_C = 225\text{ A}, T_J = 25^\circ\text{C}$ $V_{GE} = 15\text{ V}, I_C = 225\text{ A}, T_J = 150^\circ\text{C}$	$V_{CE(sat)}$	–	1.56 1.76	2.2 –	V	
Gate-emitter threshold voltage	$V_{GE} = V_{CE}, I_C = 2.25\text{ mA}$	$V_{GE(TH)}$	3.1	4.05	5.2	V	
Collector-emitter cutoff current	$V_{GE} = 0\text{ V}, V_{CE} = 650\text{ V}$	I_{CES}	–	–	300	μA	
Gate leakage current	$V_{GE} = 20\text{ V}, V_{CE} = 0\text{ V}$	I_{GES}	–	–	600	nA	
Turn-on delay time	$T_J = 25^\circ\text{C}$ $V_{CE} = 400\text{ V}, I_C = 100\text{ A}$ $V_{GE} = -8\text{ V to } +15\text{ V}, R_{G(on)} = 15\ \Omega,$ $R_{G(off)} = 30\ \Omega$	$t_{d(on)}$	–	101	–	ns	
Rise time		t_r	–	36	–		
Turn-off delay time		$t_{d(off)}$	–	674	–		
Fall time		t_f	–	63	–		
Turn on switching loss		E_{on}	–	3	–		mJ
Turn off switching loss		E_{off}	–	2.67	–		
Turn-on delay time		$T_J = 125^\circ\text{C}$ $V_{CE} = 400\text{ V}, I_C = 100\text{ A}$ $V_{GE} = -8\text{ V to } +15\text{ V}, R_{G(on)} = 15\ \Omega,$ $R_{G(off)} = 30\ \Omega$	$t_{d(on)}$	–	93		–
Rise time	t_r		–	43	–		
Turn-off delay time	$t_{d(off)}$		–	710	–		
Fall time	t_f		–	58	–		
Turn on switching loss	E_{on}		–	4	–	mJ	
Turn off switching loss	E_{off}		–	2.9	–		
Input capacitance	$V_{CE} = 20\text{ V}, V_{GE} = 0\text{ V}, f = 10\text{ kHz}$		C_{ies}	–	14630	–	pF
Output capacitance		C_{oes}	–	230	–		
Reverse transfer capacitance		C_{res}	–	64	–		
Gate charge total	$V_{CE} = 480\text{ V}, I_C = 225\text{ A}, V_{GE} = \pm 15\text{ V}$	Q_g	–	452	–	nC	
Thermal Resistance – chip-to-heatsink	Thermal grease, Thickness = 2.1 Mil \pm 2%, $\lambda = 2.9\text{ W/mK}$	R_{thJH}	–	0.42	–	$^\circ\text{C/W}$	
IGBT (T2, T3)							
Collector-emitter saturation voltage (pin-to-pin)	$V_{GE} = 15\text{ V}, I_C = 150\text{ A}, T_J = 25^\circ\text{C}$ $V_{GE} = 15\text{ V}, I_C = 150\text{ A}, T_J = 150^\circ\text{C}$	$V_{CE(sat)}$	–	1.65 1.9	2 –	V	
Gate-emitter threshold voltage	$V_{GE} = V_{CE}, I_C = 2.4\text{ mA}$	$V_{GE(TH)}$	4.6	5.6	6.5	V	
Collector-emitter cutoff current	$V_{GE} = 0\text{ V}, V_{CE} = 650\text{ V}$	I_{CES}	–	–	400	μA	
Gate leakage current	$V_{GE} = 20\text{ V}, V_{CE} = 0\text{ V}$	I_{GES}	–	–	800	nA	
Turn-on delay time	$T_J = 25^\circ\text{C}$ $V_{CE} = 400\text{ V}, I_C = 100\text{ A}$ $V_{GE} = -8\text{ V to } +15\text{ V}, R_{G(on)} = 5\ \Omega,$ $R_{G(off)} = 15\ \Omega$	$t_{d(on)}$	–	68	–	ns	
Rise time		t_r	–	26	–		
Turn-off delay time		$t_{d(off)}$	–	552	–		
Fall time		t_f	–	42	–		
Turn on switching loss		E_{on}	–	2.8	–		mJ
Turn off switching loss		E_{off}	–	2.4	–		
Turn-on delay time		$T_J = 125^\circ\text{C}$ $V_{CE} = 400\text{ V}, I_C = 100\text{ A}$ $V_{GE} = -8\text{ V to } +15\text{ V}, R_{G(on)} = 5\ \Omega,$ $R_{G(off)} = 15\ \Omega$	$t_{d(on)}$	–	63		–
Rise time	t_r		–	28	–		
Turn-off delay time	$t_{d(off)}$		–	585	–		
Fall time	t_f		–	55	–		
Turn on switching loss	E_{on}		–	4	–	mJ	
Turn off switching loss	E_{off}		–	3	–		
Input capacitance	$V_{CE} = 20\text{ V}, V_{GE} = 0\text{ V}, f = 10\text{ kHz}$		C_{ies}	–	18784	–	pF
Output capacitance		C_{oes}	–	679	–		
Reverse transfer capacitance		C_{res}	–	581	–		

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

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
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IGBT (T2, T3)

Gate charge total	$V_{CE} = 480\text{ V}, I_C = 150\text{ A}, V_{GE} = \pm 15\text{ V}$	Q_g	–	1560	–	nC
Thermal Resistance – chip-to-heatsink	Thermal grease, Thickness = 2.1 Mil \pm 2%, $\lambda = 2.9\text{ W/mK}$	R_{thJH}	–	0.34	–	$^\circ\text{C/W}$

IGBT (T5, T6)

Collector-emitter saturation voltage (pin-to-pin)	$V_{GE} = 15\text{ V}, I_C = 300\text{ A}, T_J = 25^\circ\text{C}$ $V_{GE} = 15\text{ V}, I_C = 300\text{ A}, T_J = 150^\circ\text{C}$	$V_{CE(sat)}$	–	1.15 1.14	1.35 –	V
Gate-emitter threshold voltage	$V_{GE} = V_{CE}, I_C = 4\text{ mA}$	$V_{GE(TH)}$	3.1	4.56	5.2	V
Collector-emitter cutoff current	$V_{GE} = 0\text{ V}, V_{CE} = 650\text{ V}$	I_{CES}	–	–	160	μA
Gate leakage current	$V_{GE} = 20\text{ V}, V_{CE} = 0\text{ V}$	I_{GES}	–	–	2	μA
Turn-on delay time	$T_J = 25^\circ\text{C}$ $V_{CE} = 400\text{ V}, I_C = 100\text{ A}$ $V_{GE} = -8\text{ V to } +15\text{ V}, R_G = 20\ \Omega$	$t_{d(on)}$	–	359	–	ns
Rise time		t_r	–	51	–	
Turn-off delay time		$t_{d(off)}$	–	3337	–	
Fall time		t_f	–	173	–	
Turn on switching loss		E_{on}	–	4.27	–	
Turn off switching loss	E_{off}	–	5.1	–		
Turn-on delay time	$T_J = 125^\circ\text{C}$ $V_{CE} = 400\text{ V}, I_C = 100\text{ A}$ $V_{GE} = -8\text{ V to } +15\text{ V}, R_G = 20\ \Omega$	$t_{d(on)}$	–	300	–	ns
Rise time		t_r	–	57	–	
Turn-off delay time		$t_{d(off)}$	–	3575	–	
Fall time		t_f	–	205	–	
Turn on switching loss		E_{on}	–	5	–	
Turn off switching loss	E_{off}	–	5.8	–		
Input capacitance	$V_{CE} = 20\text{ V}, V_{GE} = 0\text{ V}, f = 10\text{ kHz}$	C_{ies}	–	67524	–	pF
Output capacitance		C_{oes}	–	428	–	
Reverse transfer capacitance		C_{res}	–	375	–	
Gate charge total	$V_{CE} = 480\text{ V}, I_C = 300\text{ A}, V_{GE} = \pm 15\text{ V}$	Q_g	–	3319	–	nC
Thermal Resistance – chip-to-heatsink	Thermal grease, Thickness = 2.1 Mil \pm 2%, $\lambda = 2.9\text{ W/mK}$	R_{thJH}	–	0.28	–	$^\circ\text{C/W}$

IGBT INVERSE DIODE (D1, D4)

Forward voltage (pin-to-pin)	$I_F = 150\text{ A}, T_J = 25^\circ\text{C}$ $I_F = 150\text{ A}, T_J = 150^\circ\text{C}$	V_F	–	1.76 1.78	2.3 –	V
Reverse recovery time	$T_J = 25^\circ\text{C}$ $V_{CE} = 400\text{ V}, I_C = 100\text{ A}, V_{GE} = -8\text{ V to } +15\text{ V}, R_G = 5\ \Omega$	T_{rr}	–	96	–	ns
Reverse recovery charge		Q_{rr}	–	1.32	–	μC
Peak reverse recovery current		I_{rrm}	–	45	–	A
Reverse Peak rate of fall of recovery current		di/dt	–	2313	–	$\text{A}/\mu\text{s}$
Reverse recovery energy		E_{rr}	–	0.21	–	mJ
Reverse recovery time	$T_J = 125^\circ\text{C}$ $V_{CE} = 400\text{ V}, I_C = 100\text{ A}, V_{GE} = -8\text{ V to } +15\text{ V}, R_G = 5\ \Omega$	T_{rr}	–	113	–	ns
Reverse recovery charge		Q_{rr}	–	3.03	–	μC
Peak reverse recovery current		I_{rrm}	–	60	–	A
Reverse Peak rate of fall of recovery current		di/dt	–	1104	–	$\text{A}/\mu\text{s}$
Reverse recovery energy		E_{rr}	–	0.47	–	mJ
Thermal Resistance – chip-to-heatsink	Thermal grease, Thickness = 2.1 Mil \pm 2%, $\lambda = 2.9\text{ W/mK}$	R_{thJH}	–	0.54	–	$^\circ\text{C/W}$

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

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
IGBT INVERSE DIODE (D2, D3, D5, D6)						
Forward voltage (pin-to-pin)	$I_F = 225\text{ A}, T_J = 25^\circ\text{C}$ $I_F = 225\text{ A}, T_J = 150^\circ\text{C}$	V_F	–	1.76 1.78	2.3 –	V
Reverse recovery time	$T_J = 25^\circ\text{C}$ $V_{CE} = 400\text{ V}, I_C = 100\text{ A}, V_{GE} = -8\text{ V to } +15\text{ V}, R_G = 15\ \Omega$	T_{rr}	–	44	–	ns
Reverse recovery charge		Q_{rr}	–	1.03	–	μC
Peak reverse recovery current		I_{rrm}	–	48	–	A
Reverse Peak rate of fall of recovery current		di/dt	–	2971	–	$\text{A}/\mu\text{s}$
Reverse recovery energy		Err	–	0.18	–	mJ
Reverse recovery time	$T_J = 125^\circ\text{C}$ $V_{CE} = 400\text{ V}, I_C = 100\text{ A}, V_{GE} = -8\text{ V to } +15\text{ V}, R_G = 15\ \Omega$	T_{rr}	–	82	–	ns
Reverse recovery charge		Q_{rr}	–	3.33	–	μC
Peak reverse recovery current		I_{rrm}	–	71	–	A
Reverse Peak rate of fall of recovery current		di/dt	–	2971	–	$\text{A}/\mu\text{s}$
Reverse recovery energy		Err	–	0.52	–	mJ
Thermal Resistance – chip-to-heatsink	Thermal grease, Thickness = 2.1 Mil \pm 2%, $\lambda = 2.9\text{ W/mK}$	R_{thJH}	–	0.45	–	$^\circ\text{C/W}$

THERMISTOR CHARACTERISTICS

Nominal resistance	$T = 25^\circ\text{C}$	R_{25}	–	22	–	$\text{k}\Omega$
Nominal resistance	$T = 100^\circ\text{C}$	R_{100}	–	1468	–	Ω
Deviation of R_{25}		DR/R	–5	–	5	%
Power dissipation		P_D	–	200	–	mW
Power dissipation constant			–	2	–	$\text{mW}/^\circ\text{C}$
B-value	$B(25/50)$, tol $\pm 3\%$		–	–	3950	$^\circ\text{C}$
B-value	$B(25/100)$, tol $\pm 3\%$		–	–	3998	$^\circ\text{C}$
NTC reference			–	–	B	

ORDERING INFORMATION

Orderable Part Number	Marking	Package	Shipping
SNXH100M65L3Q2F2PG (GenIII – Q2PACK, Press-fit Pin)	SNXH100M65L3Q2F2PG	Q2PACK (Pb-Free)	12 Units / Blister Tray
SNXH100M65L4Q2F2P2G-N1 (GenIII – Q2PACK, Press-fit Pin)	SNXH100M65L4Q2F2P2G-N1	Q2PACK (Pb-Free)	12 Units / Blister Tray

SNXH100M65L3Q2F2PG, SNXH100M65L4Q2F2P2G-N1

TYPICAL CHARACTERISTICS - IGBT T1-1, T1-2, T4-1, T4-2 AND DIODE D1, D4

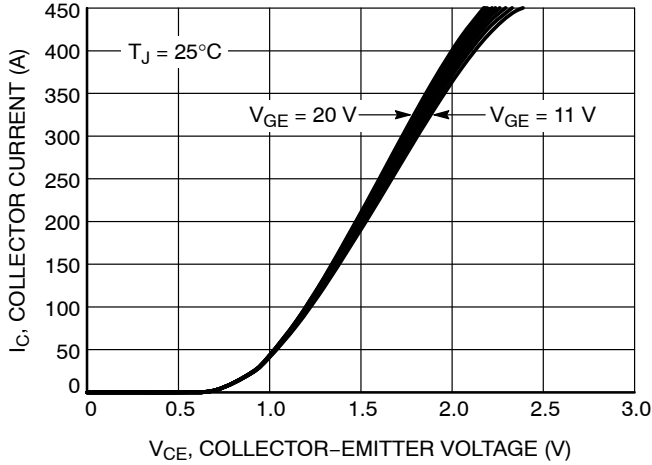


Figure 1. Typical Output Characteristics

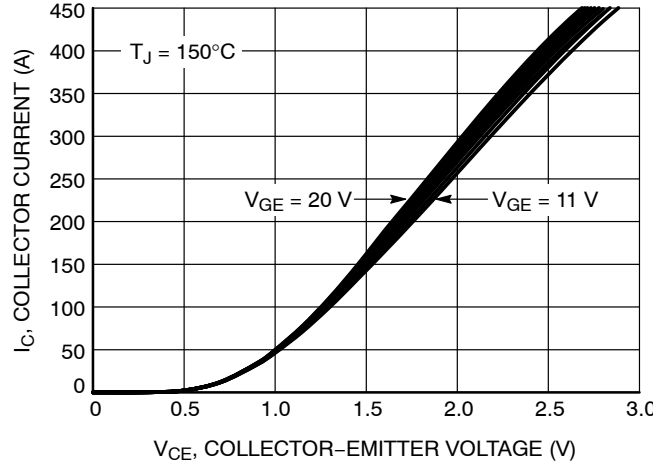


Figure 2. Typical Output Characteristics

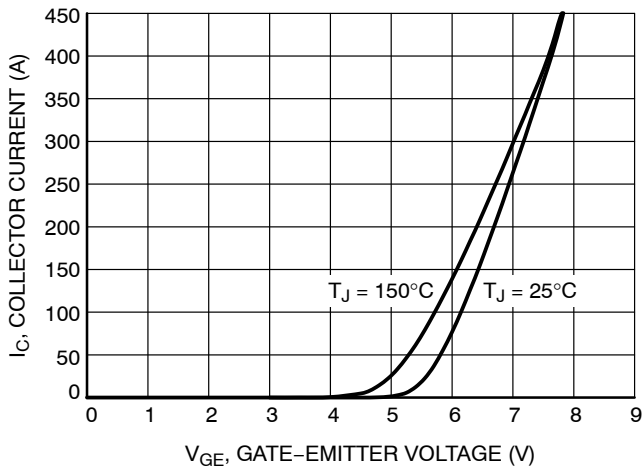


Figure 3. Typical Transfer Characteristics

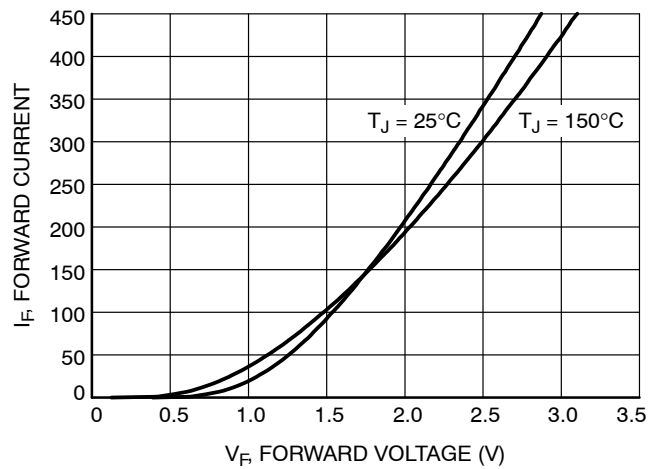


Figure 4. Typical Transfer Characteristics

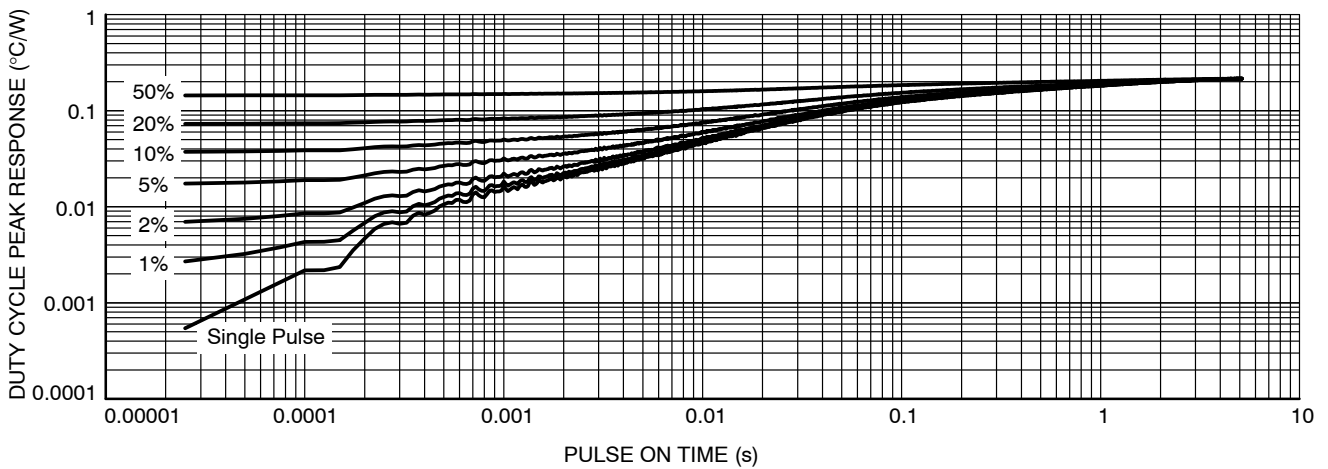


Figure 5. Transient Thermal Impedance (T1, T4)

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TYPICAL CHARACTERISTICS - IGBT T1-1, T1-2, T4-1, T4-2 AND DIODE D1, D4

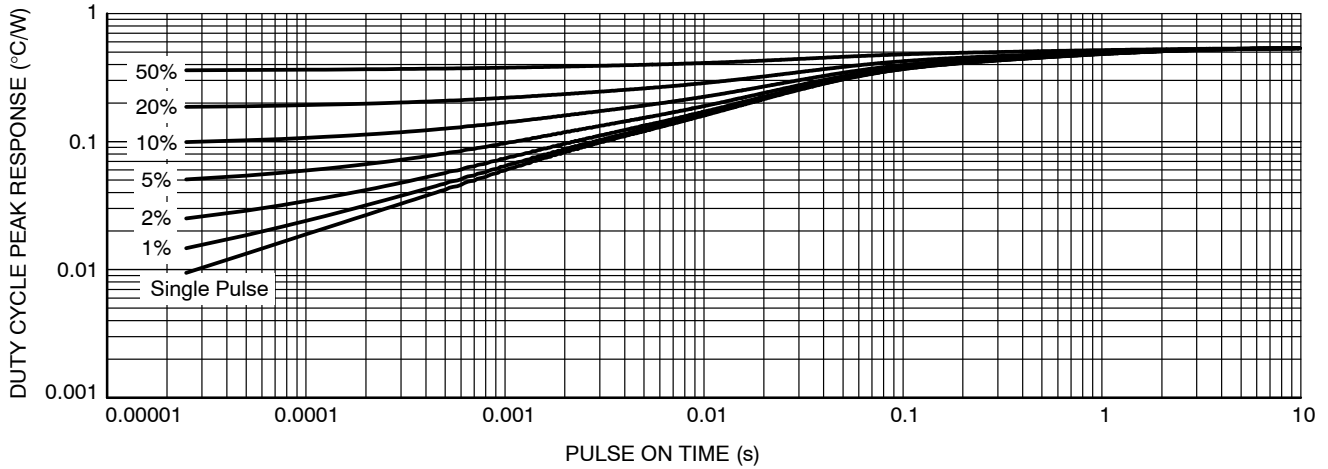


Figure 6. Transient Thermal Impedance (D1, D4)

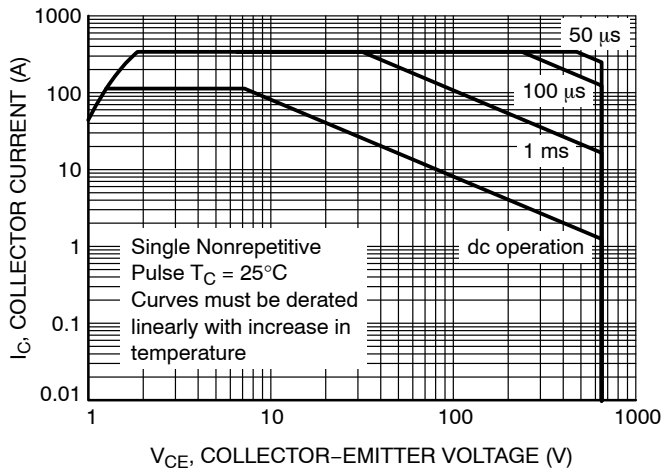


Figure 7. FBSOA (T1, T4)

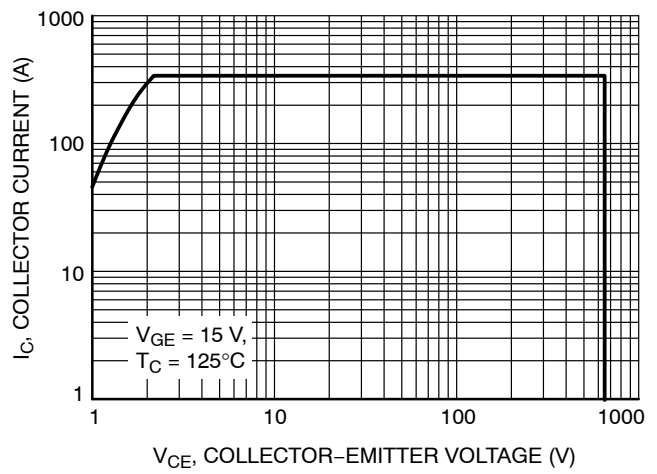


Figure 8. RBSOA (T1, T4)

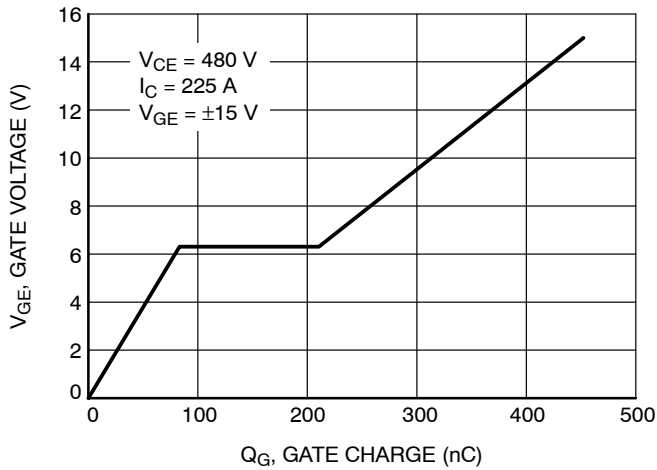


Figure 9. Gate Voltage vs. Gate Charge

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TYPICAL CHARACTERISTICS – IGBT T2, T3 AND DIODE D2, D3

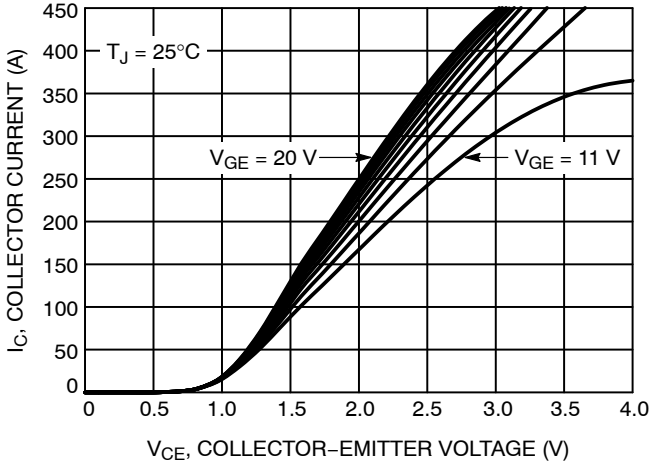


Figure 10. Typical Output Characteristics

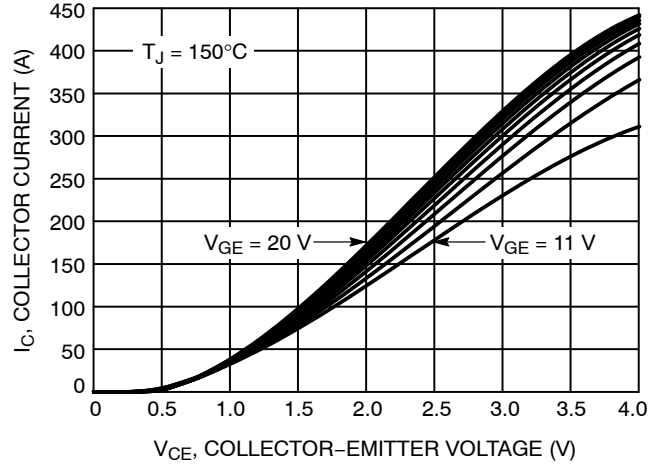


Figure 11. Typical Output Characteristics

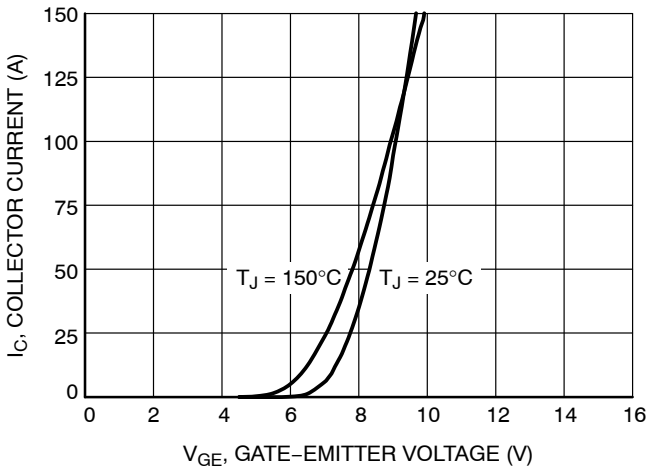


Figure 12. Typical Transfer Characteristics

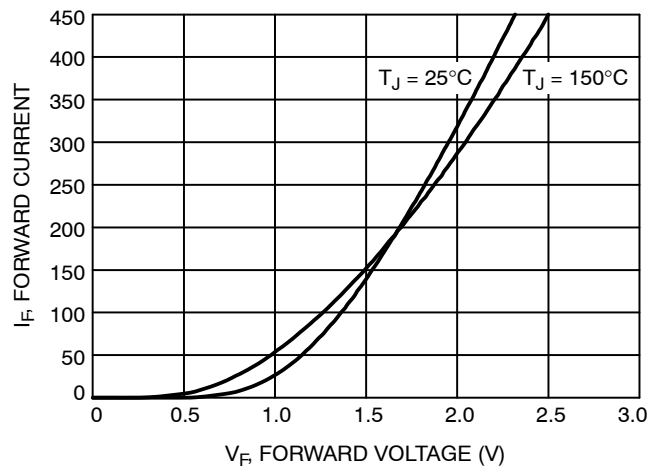


Figure 13. Diode Forward Characteristics

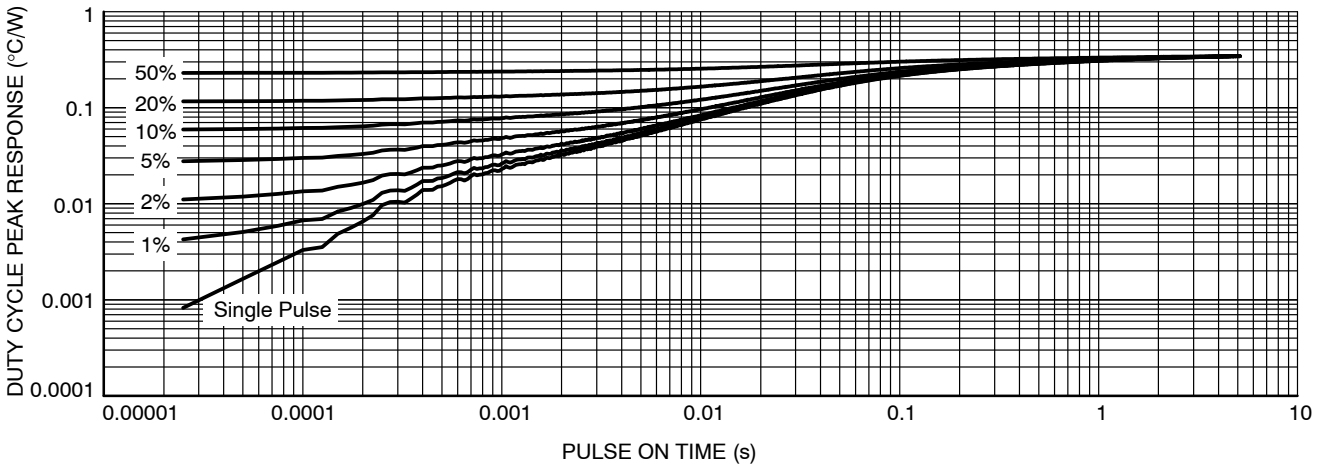


Figure 14. Transient Thermal Impedance (T2, T3)

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TYPICAL CHARACTERISTICS – IGBT T2, T3 AND DIODE D2, D3

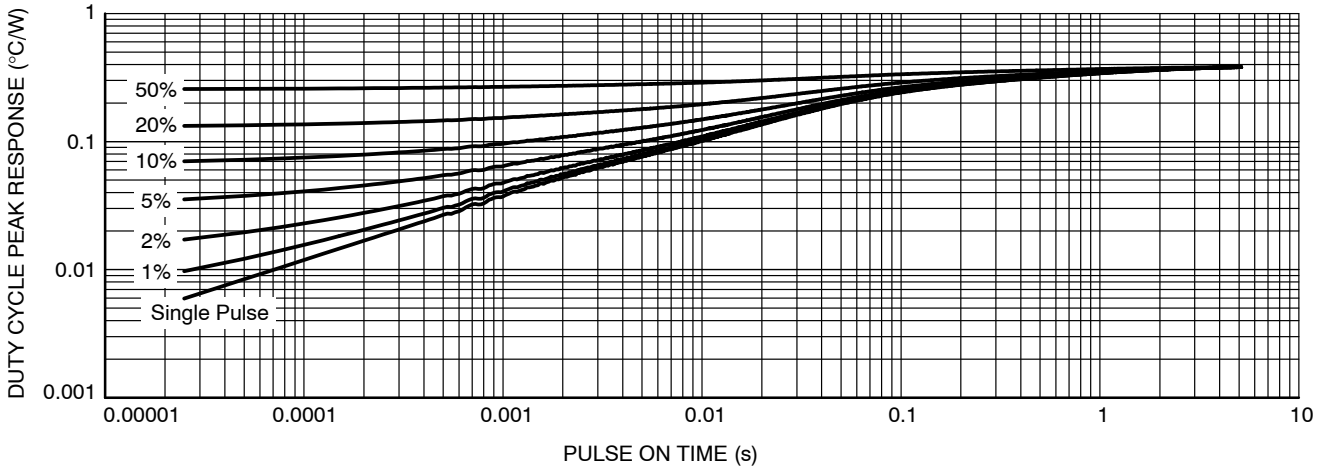


Figure 15. Transient Thermal Impedance (D2, D3)

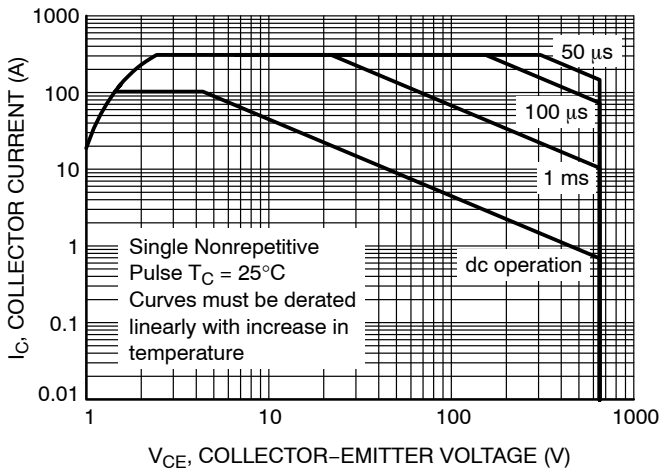


Figure 16. FBSOA (T2, T3)

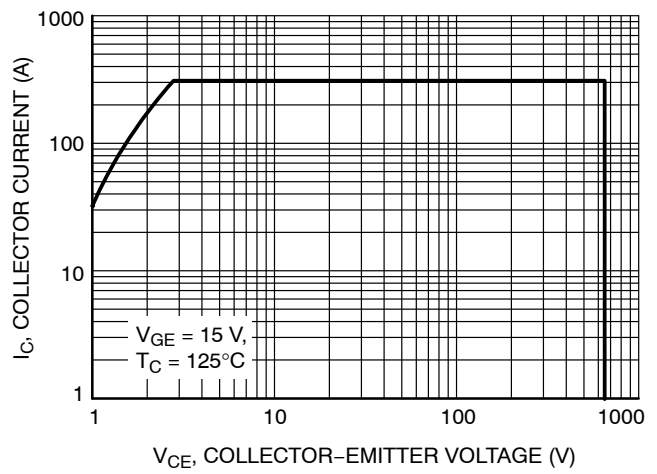


Figure 17. RBSOA (T2, T3)

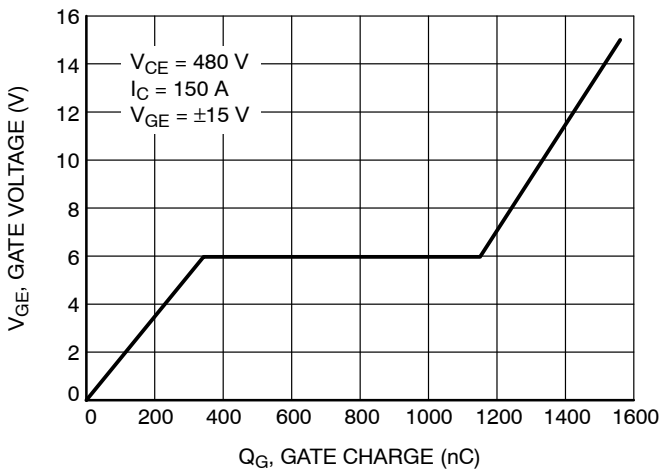


Figure 18. Gate Voltage vs. Gate Charge

SNXH100M65L3Q2F2PG, SNXH100M65L4Q2F2P2G-N1

TYPICAL CHARACTERISTICS – IGBT T5, T6 AND DIODE D5, D6

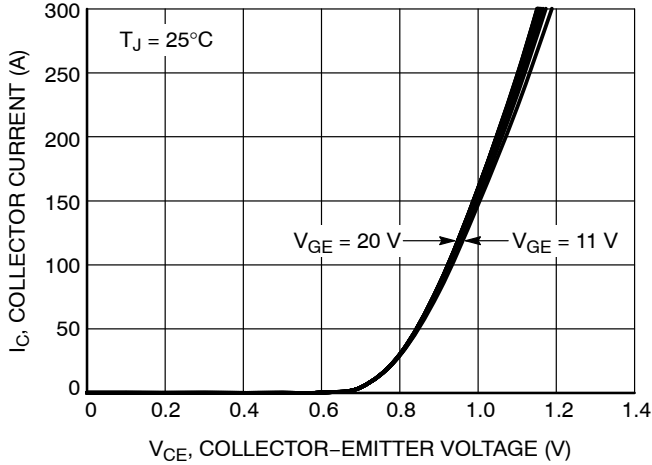


Figure 19. Typical Output Characteristics

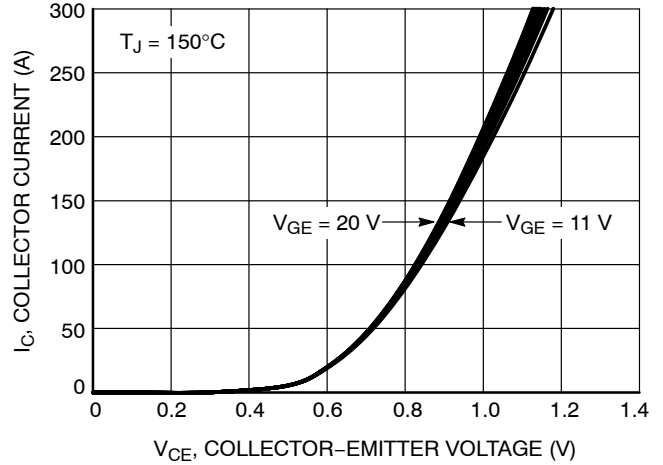


Figure 20. Typical Output Characteristics

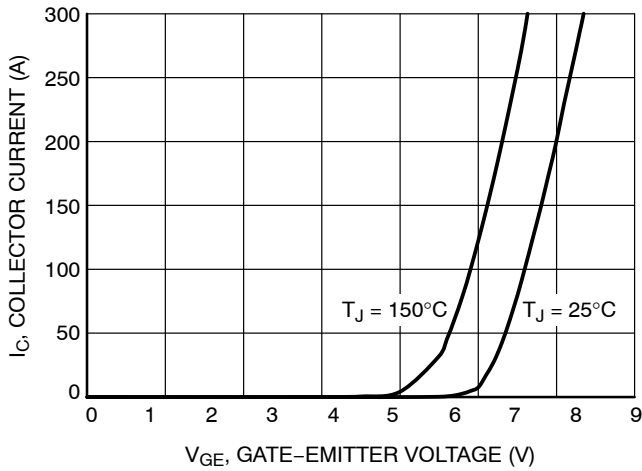


Figure 21. Typical Transfer Characteristics

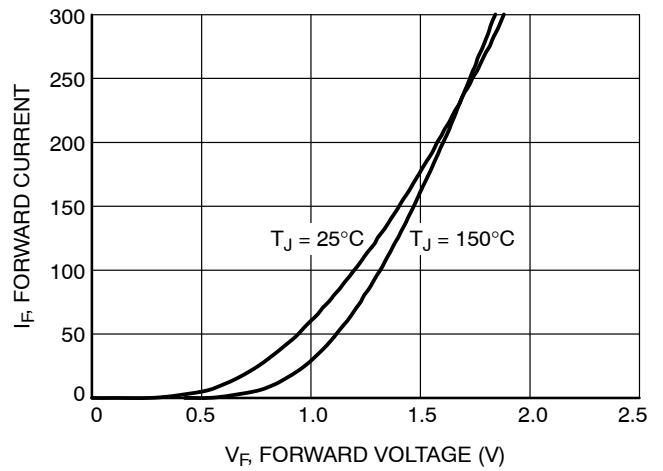


Figure 22. Diode Forward Characteristics

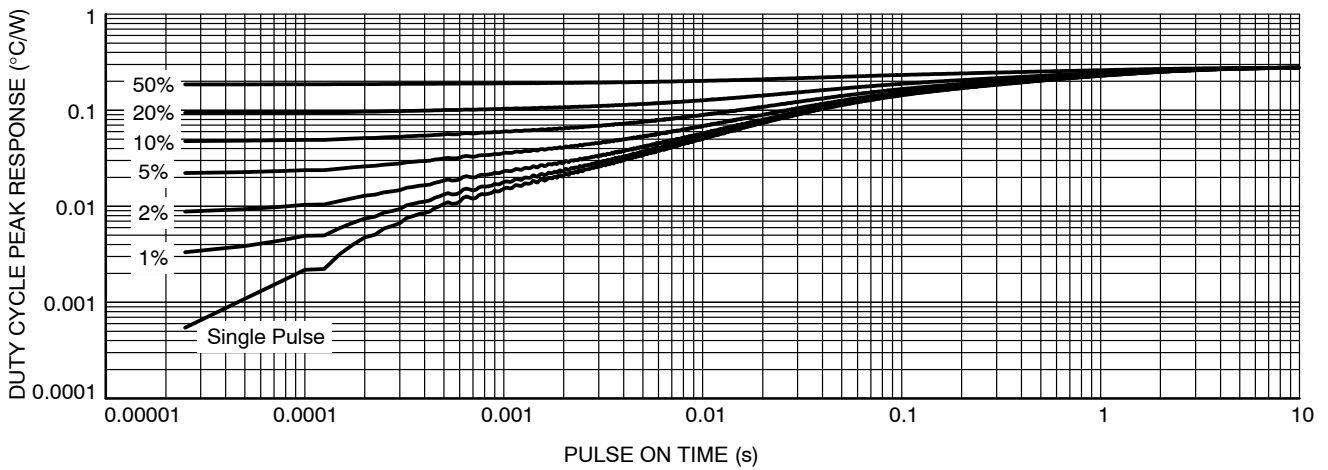


Figure 23. Transient Thermal Impedance (T5, T6)

SNXH100M65L3Q2F2PG, SNXH100M65L4Q2F2P2G-N1

TYPICAL CHARACTERISTICS – IGBT T5, T6 AND DIODE D5, D6

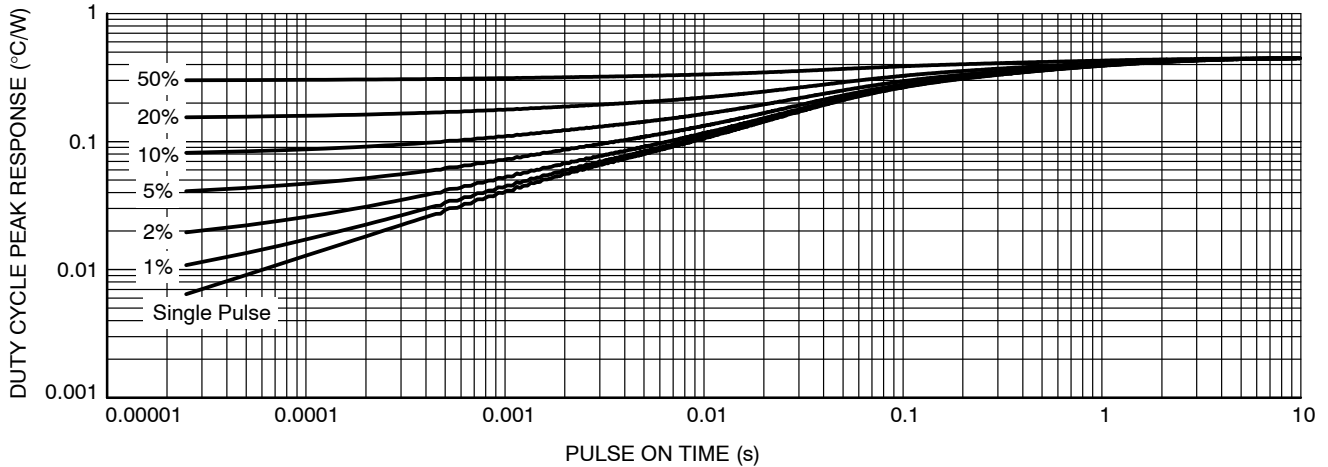


Figure 24. Transient Thermal Impedance (D5, D6)

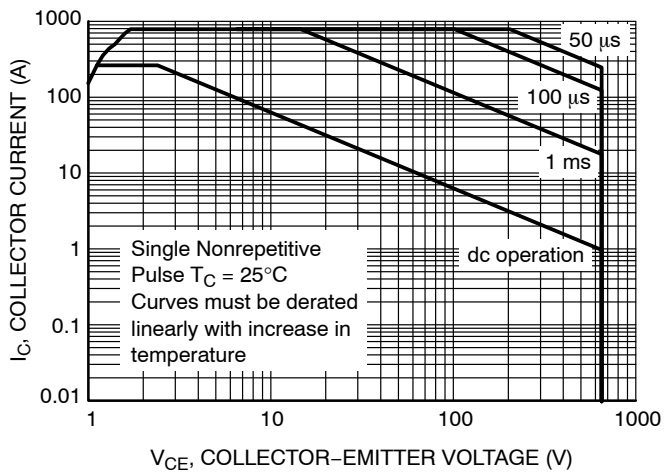


Figure 25. FBSOA (T5, T6)

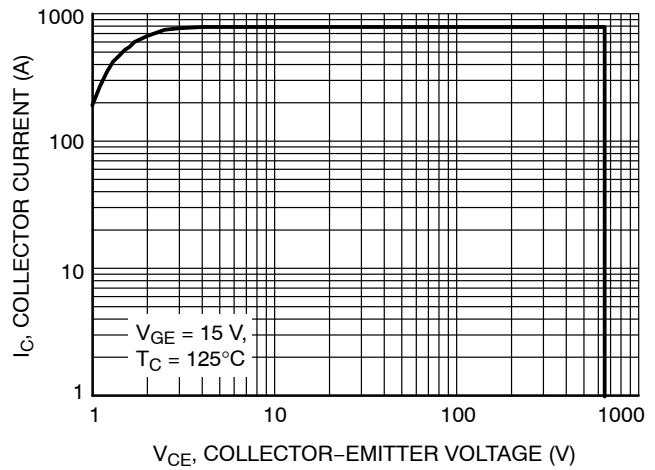


Figure 26. RBSOA (T5, T6)

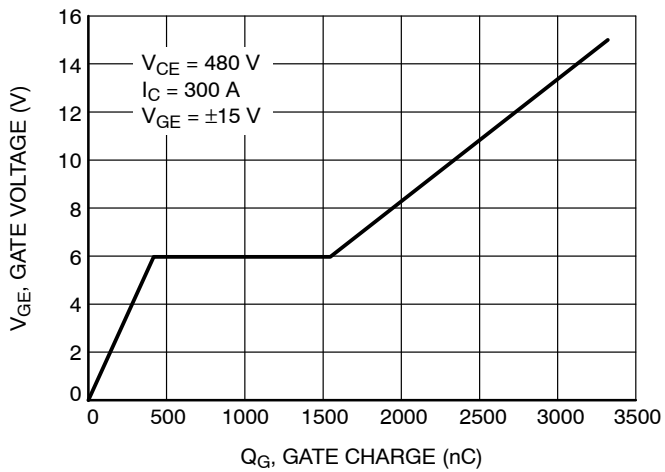


Figure 27. Gate Voltage vs. Gate Charge

SNXH100M65L3Q2F2PG, SNXH100M65L4Q2F2P2G-N1

TYPICAL CHARACTERISTICS – T1/T4 IGBT COMUTATES D2/D3 DIODE

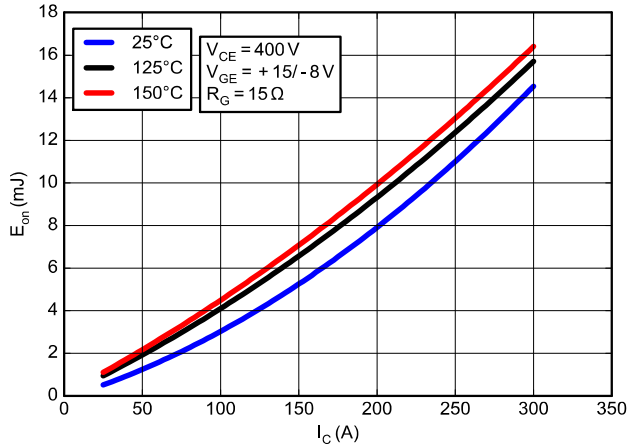


Figure 28. Typical Switching Loss Eon vs. IC

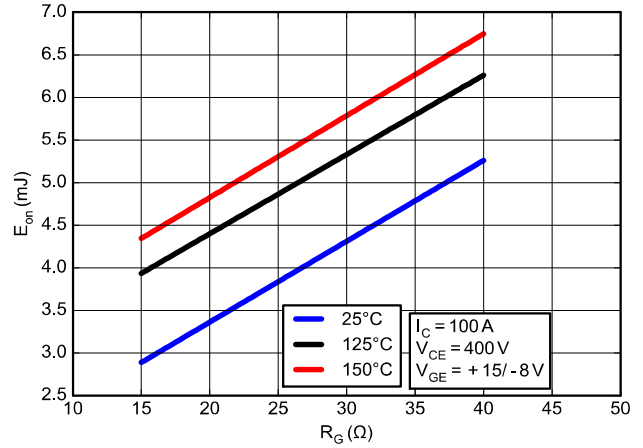


Figure 29. Typical Switching Loss Eon vs. RG

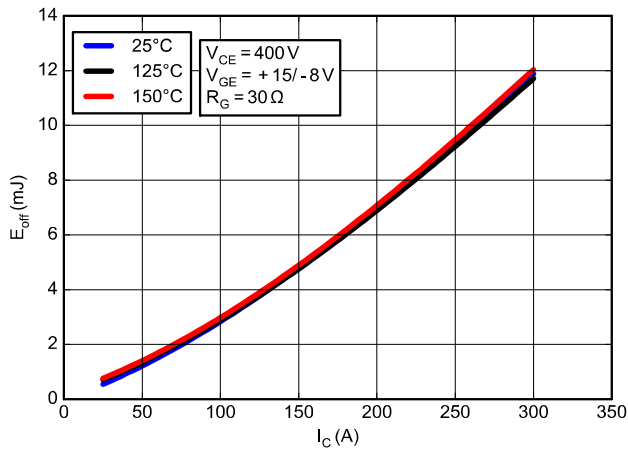


Figure 30. Typical Switching Loss Eoff vs. IC

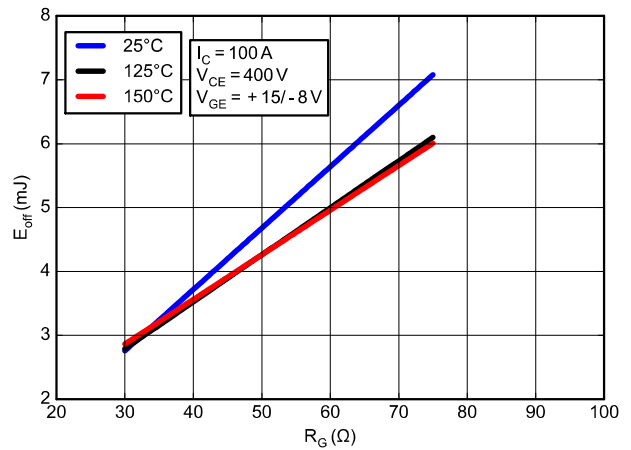


Figure 31. Typical Switching Loss Eoff vs. RG

SNXH100M65L3Q2F2PG, SNXH100M65L4Q2F2P2G-N1

TYPICAL CHARACTERISTICS – T1/T4 IGBT COMUTATES D2/D3 DIODE

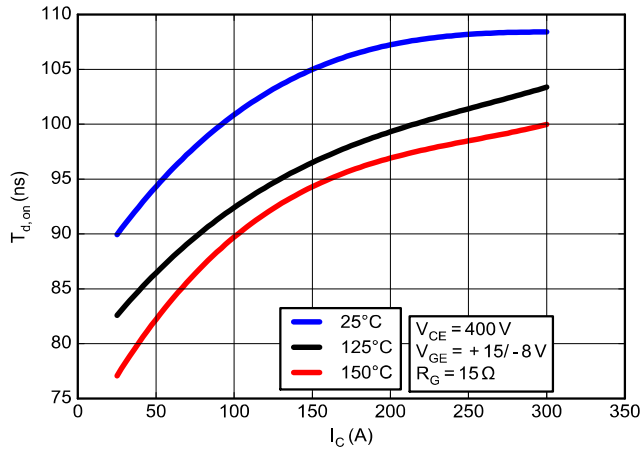


Figure 32. Typical Switching Time Tdon vs. IC

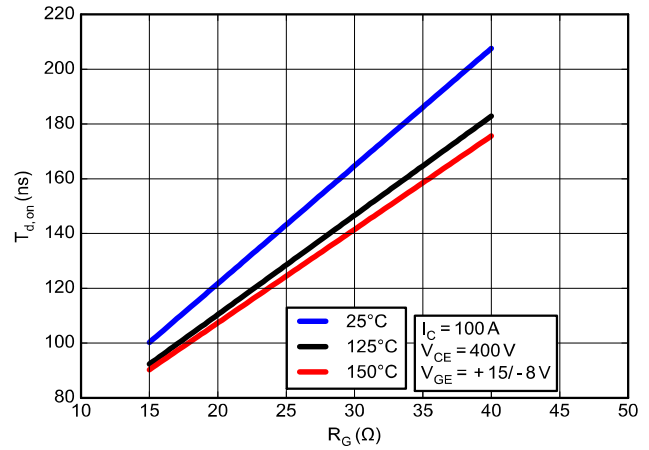


Figure 33. Typical Switching Time Tdon vs. RG

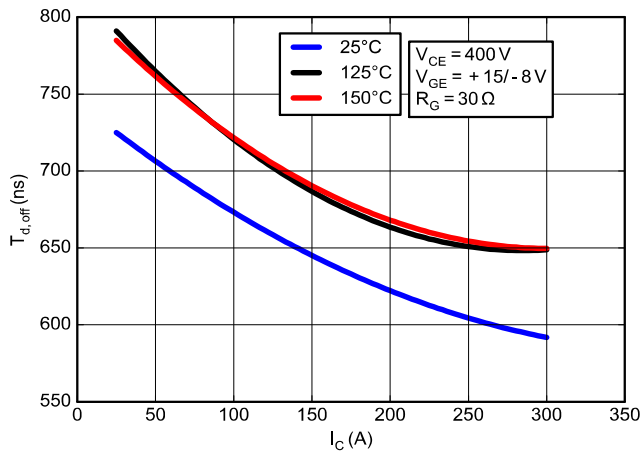


Figure 34. Typical Switching Time Tdoff vs. IC

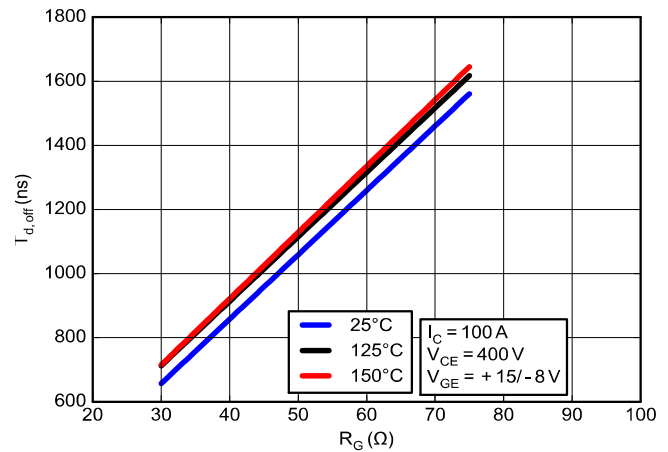


Figure 35. Typical Switching Time Tdoff vs. RG

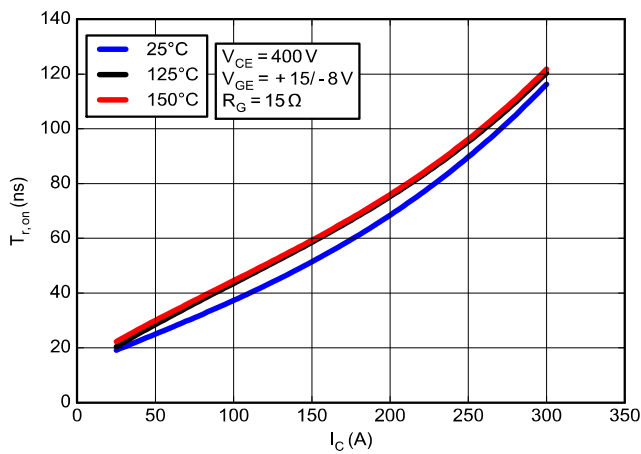


Figure 36. Typical Switching Time Tron vs. IC

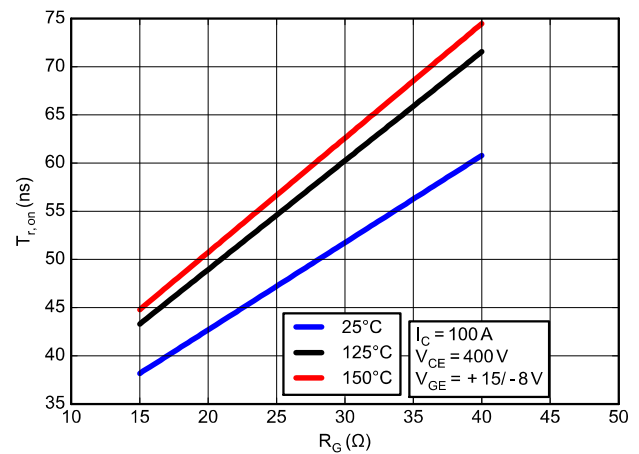


Figure 37. Typical Switching Time Tron vs. RG

SNXH100M65L3Q2F2PG, SNXH100M65L4Q2F2P2G-N1

TYPICAL CHARACTERISTICS – T1/T4 IGBT COMUTATES D2/D3 DIODE

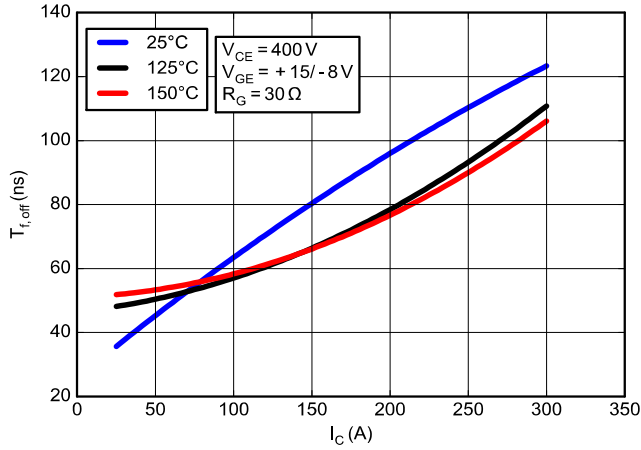


Figure 38. Typical Switching Time T_f vs. I_C

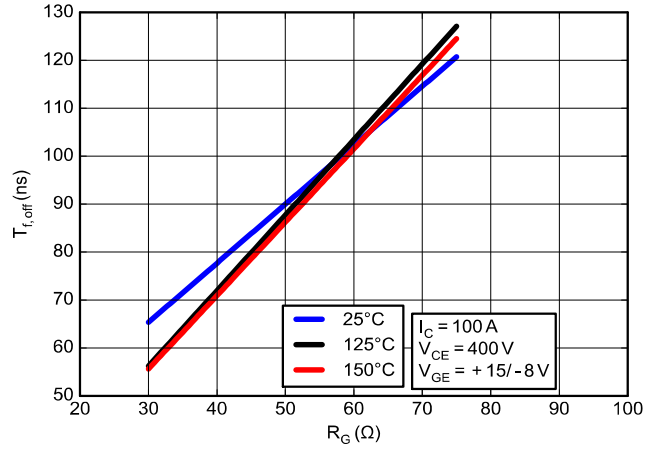


Figure 39. Typical Switching Time T_f vs. R_G

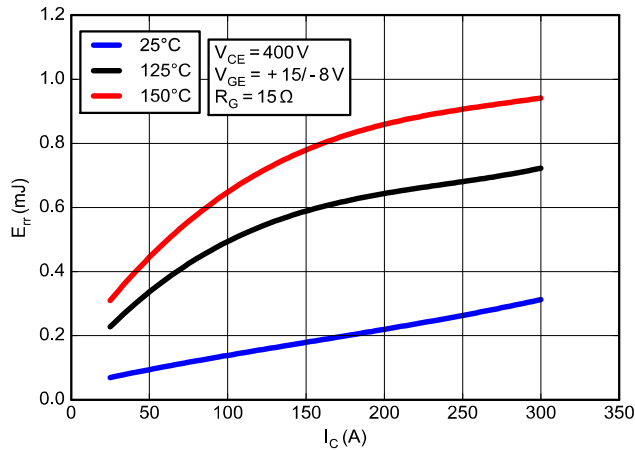


Figure 40. Typical Reverse Recovery Energy vs. I_C

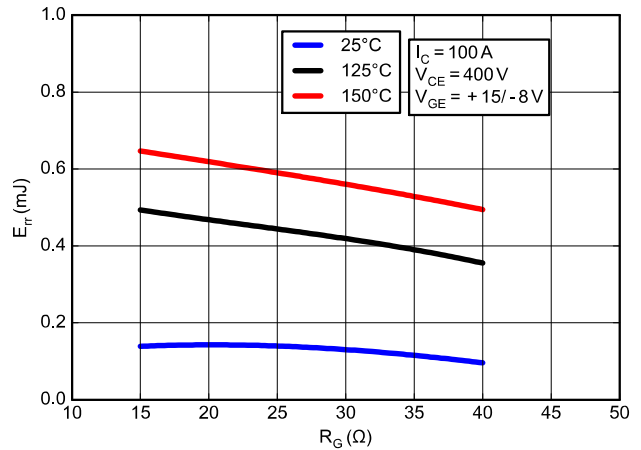


Figure 41. Typical Reverse Recovery Energy vs. R_G

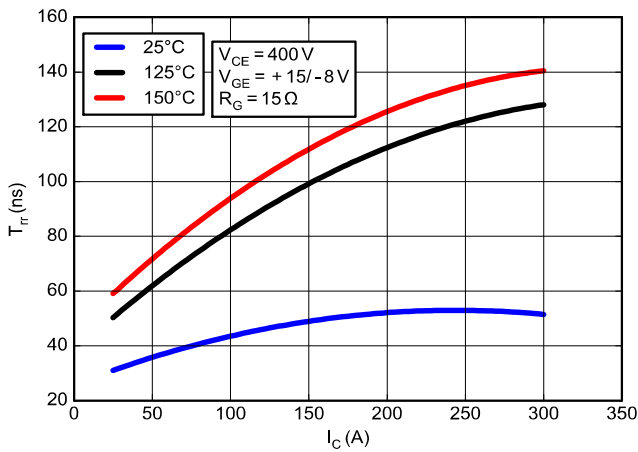


Figure 42. Typical Reverse Recovery Time vs. I_C

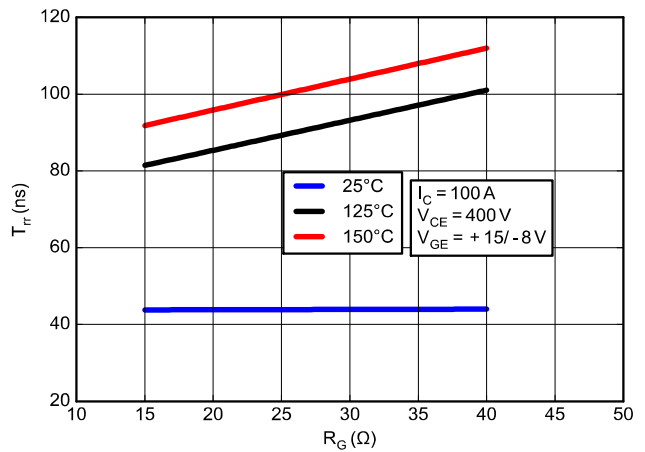


Figure 43. Typical Reverse Recovery Time vs. R_G

TYPICAL CHARACTERISTICS – T1/T4 IGBT COMUTATES D2/D3 DIODE

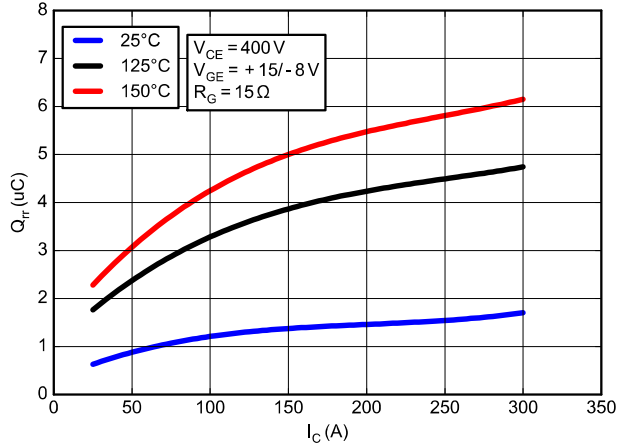


Figure 44. Typical Reverse Recovery Charge vs. IC

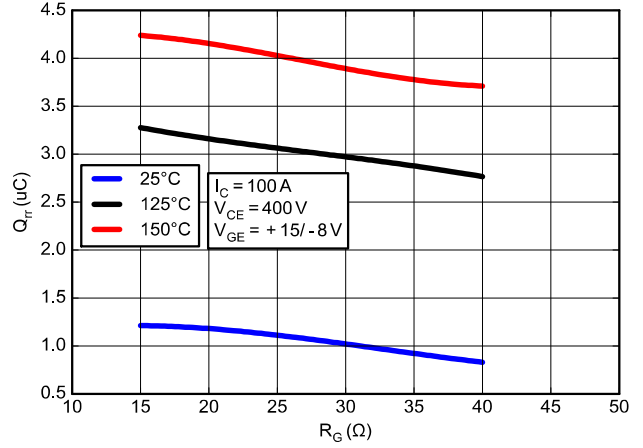


Figure 45. Typical Reverse Recovery Charge vs. RG

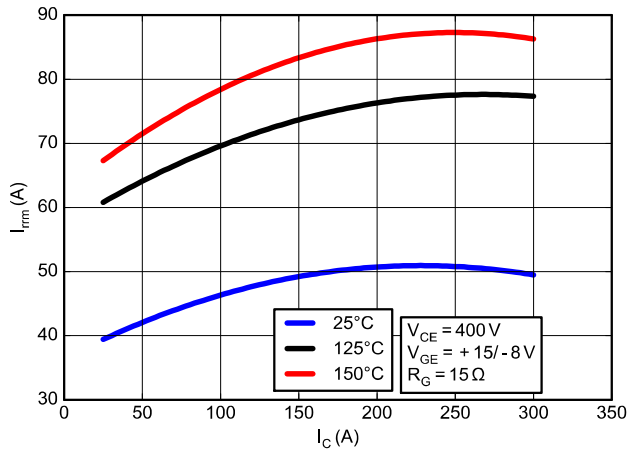


Figure 46. Typical Reverse Recovery Current vs. IC

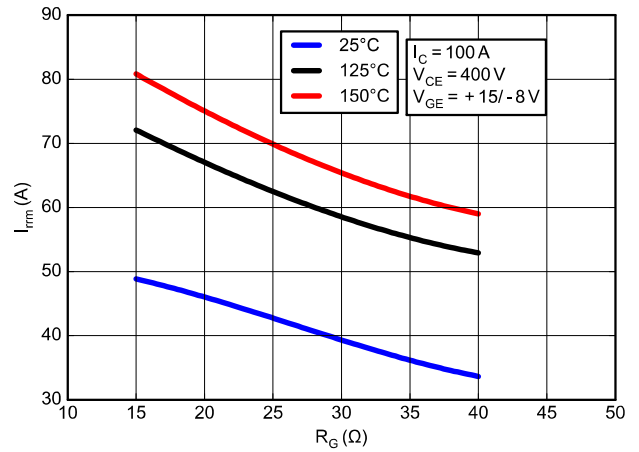


Figure 47. Typical Reverse Recovery Current vs. RG

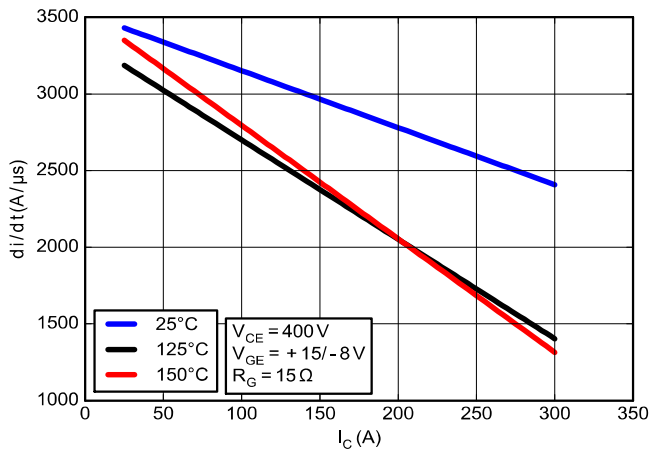


Figure 48. Typical di/dt vs. IC

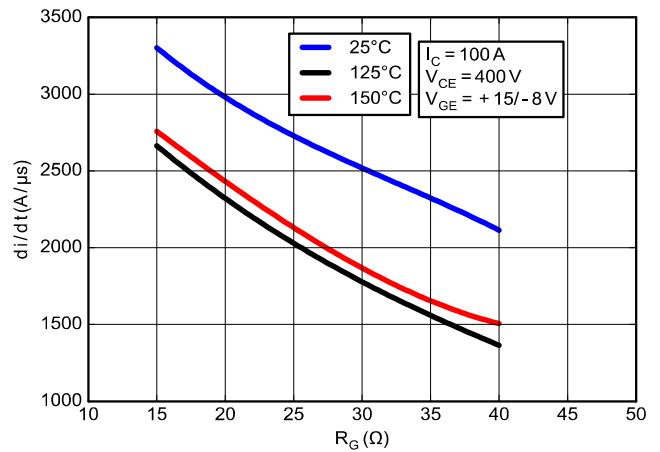


Figure 49. Typical di/dt vs. RG

TYPICAL CHARACTERISTICS – T2/T3 IGBT COMUTATES D1/D4 DIODE

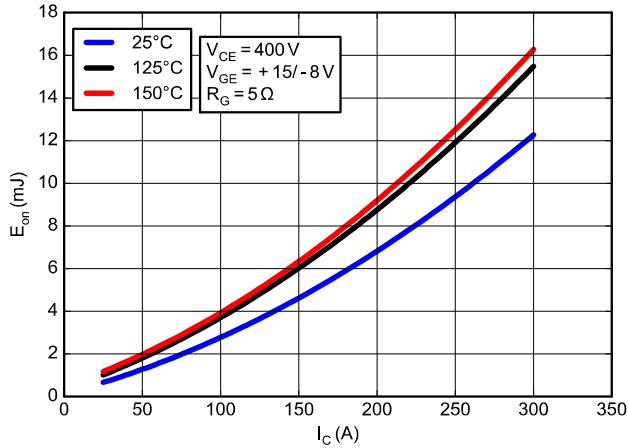


Figure 50. Typical Switching Energy Eon vs. IC

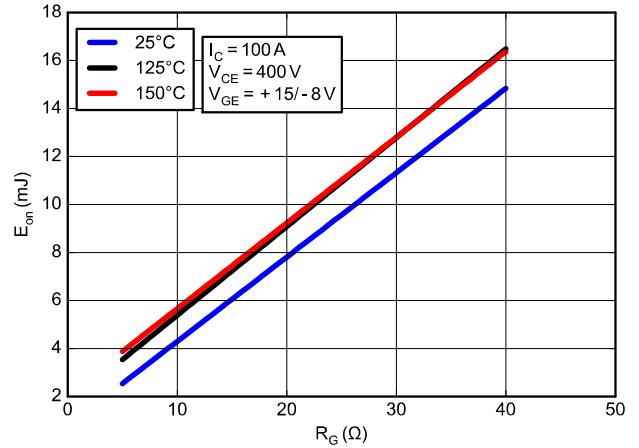


Figure 51. Typical Switching Energy Eon vs. RG

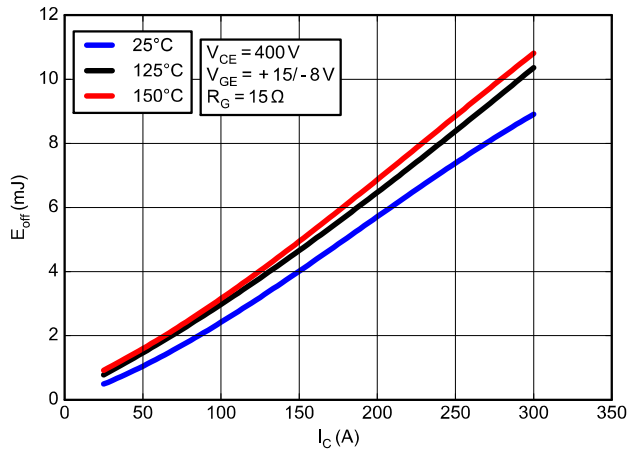


Figure 52. Typical Switching Energy Eoff vs. IC

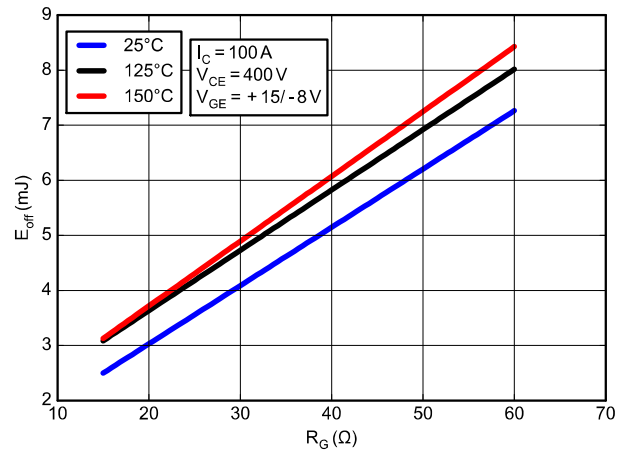


Figure 53. Typical Switching Energy Eoff vs. RG

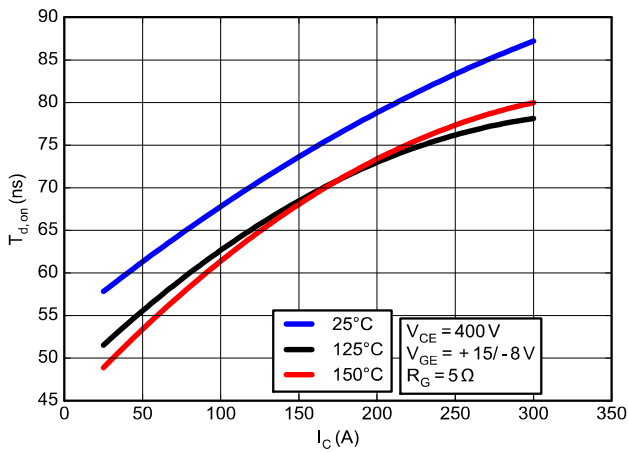


Figure 54. Typical Switching Time Tdon vs. IC

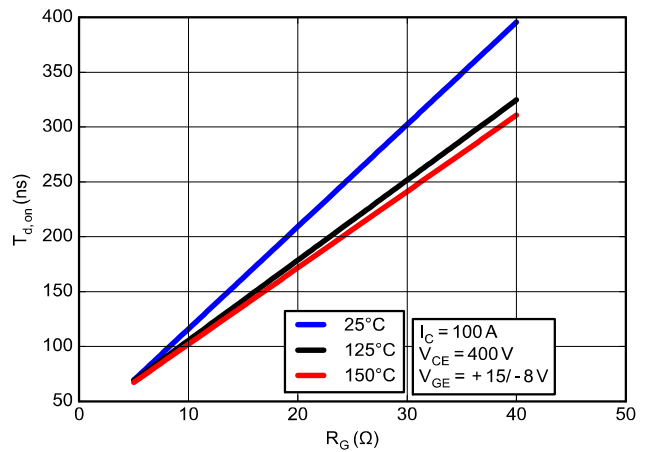


Figure 55. Typical Switching Time Tdon vs. RG

SNXH100M65L3Q2F2PG, SNXH100M65L4Q2F2P2G-N1

TYPICAL CHARACTERISTICS – T2/T3 IGBT COMUTATES D1/D4 DIODE

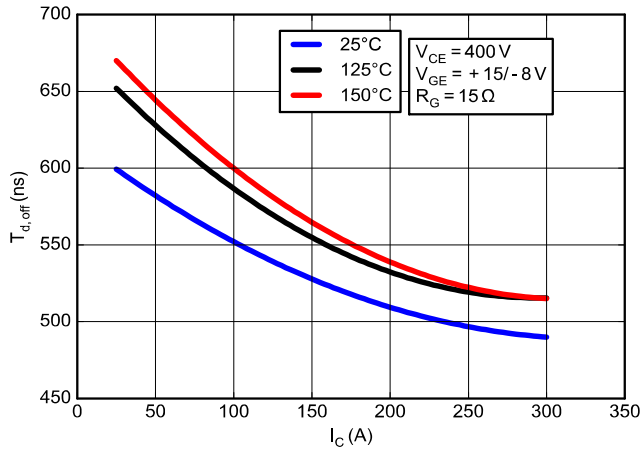


Figure 56. Typical Switching Time Tdoff vs. IC

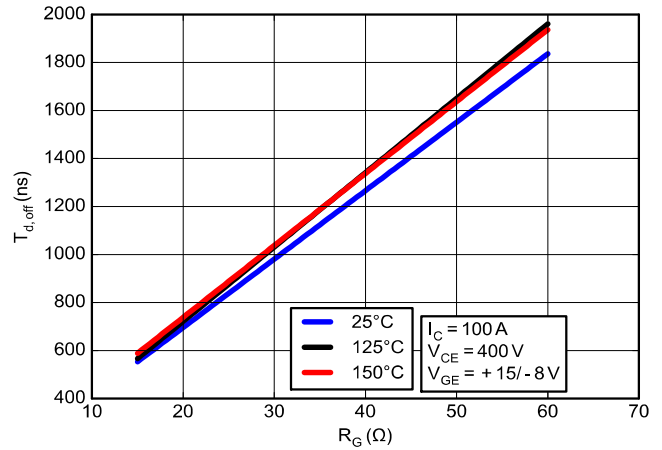


Figure 57. Typical Switching Time Tdoff vs. R_G

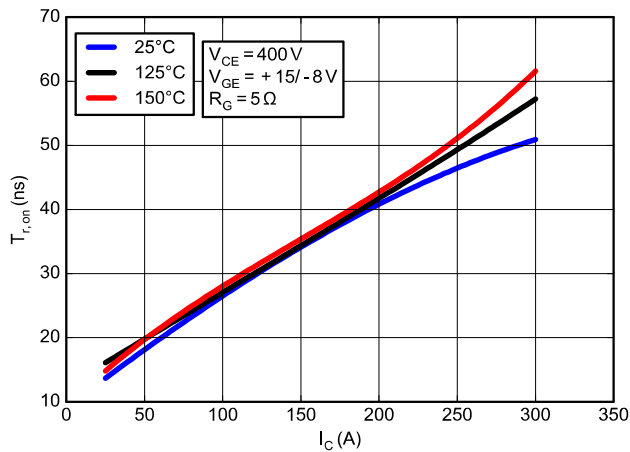


Figure 58. Typical Switching Time Tr vs. IC

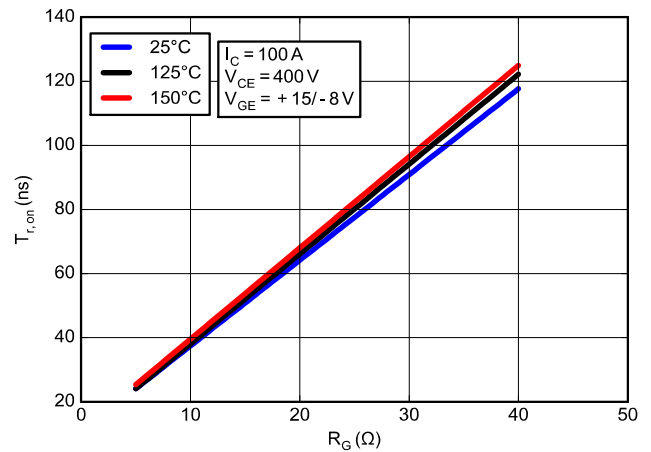


Figure 59. Typical Switching Time Tr vs. R_G

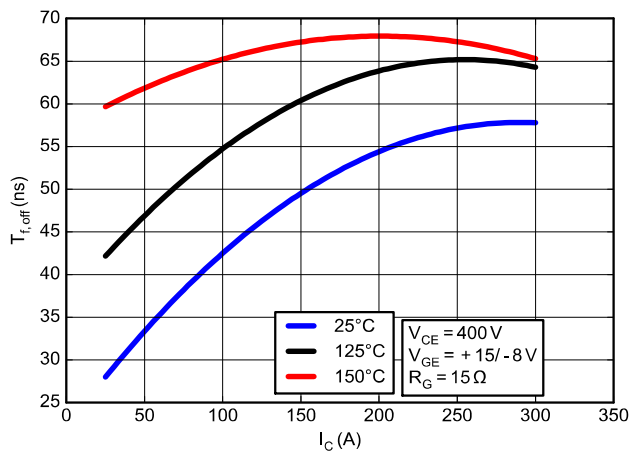


Figure 60. Typical Switching Time Tf vs. IC

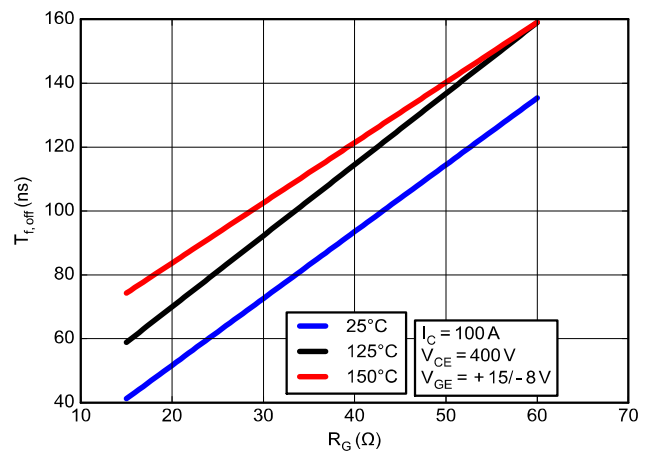


Figure 61. Typical Switching Time Tf vs. R_G

SNXH100M65L3Q2F2PG, SNXH100M65L4Q2F2P2G-N1

TYPICAL CHARACTERISTICS – T2/T3 IGBT COMUTATES D1/D4 DIODE

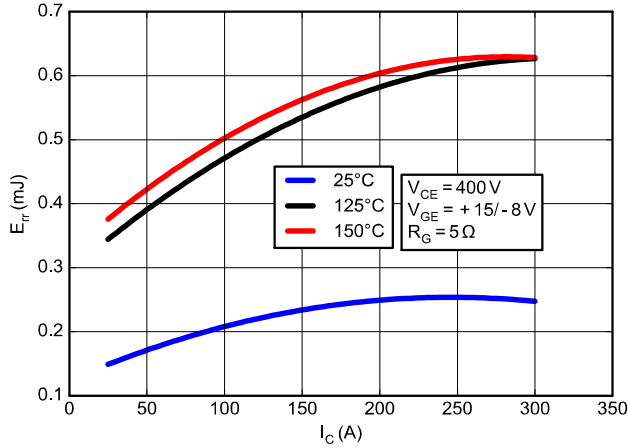


Figure 62. Typical Reverse Recovery Energy Loss vs. IC

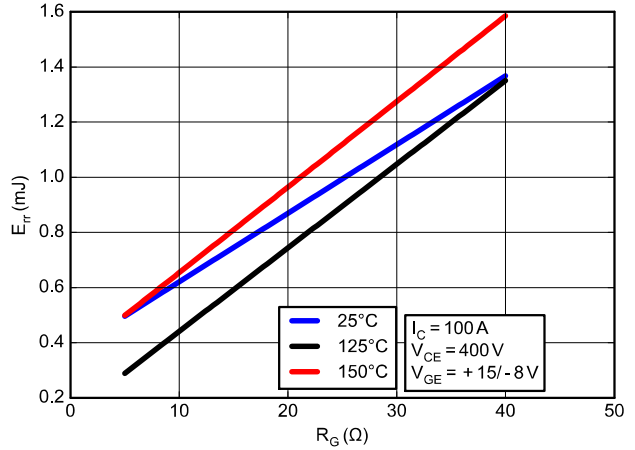


Figure 63. Typical Reverse Recovery Energy Loss vs. R_G

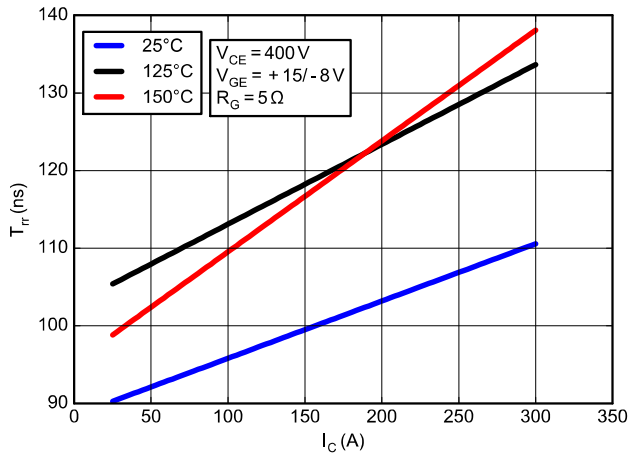


Figure 64. Typical Reverse Recovery Time vs. IC

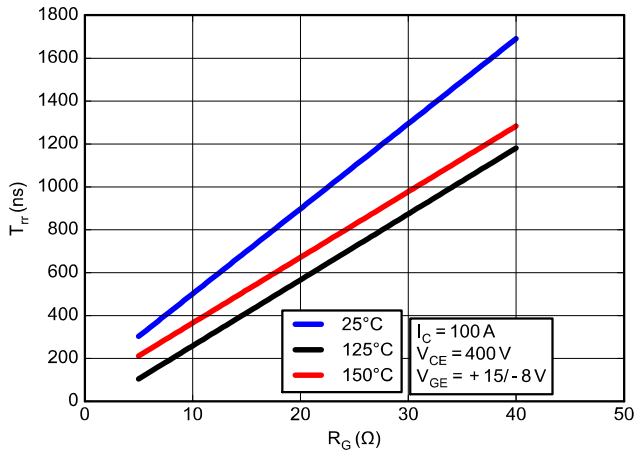


Figure 65. Typical Reverse Recovery Time vs. R_G

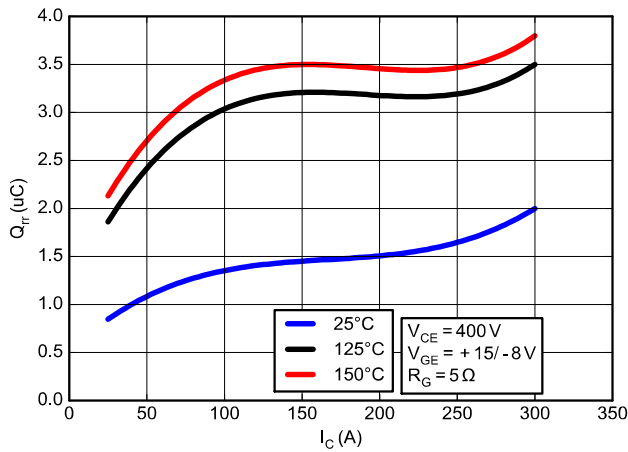


Figure 66. Typical Reverse Recovery Charge vs. IC

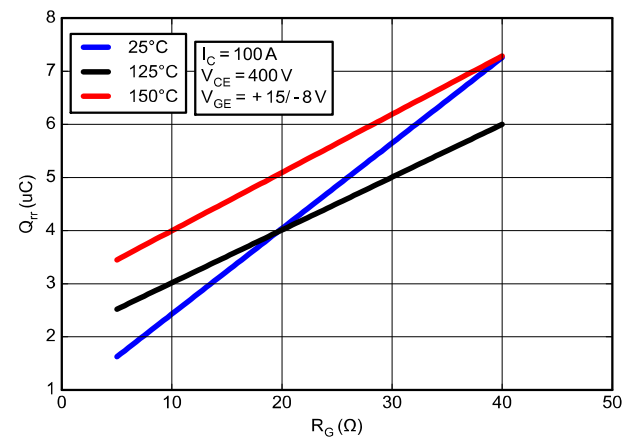


Figure 67. Typical Reverse Recovery Charge vs. R_G

SNXH100M65L3Q2F2PG, SNXH100M65L4Q2F2P2G-N1

TYPICAL CHARACTERISTICS – T2/T3 IGBT COMUTATES D1/D4 DIODE

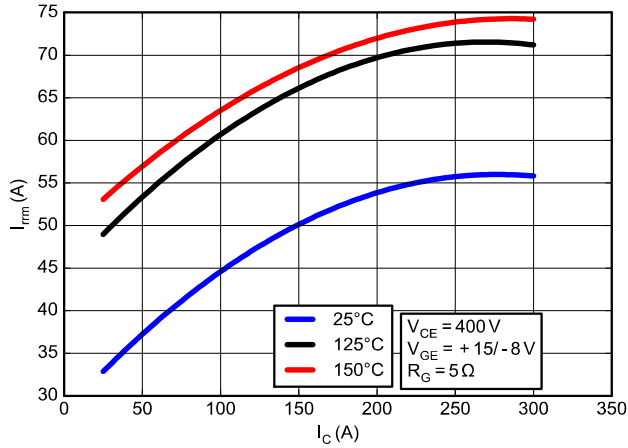


Figure 68. Typical Reverse Recovery Current vs. I_C

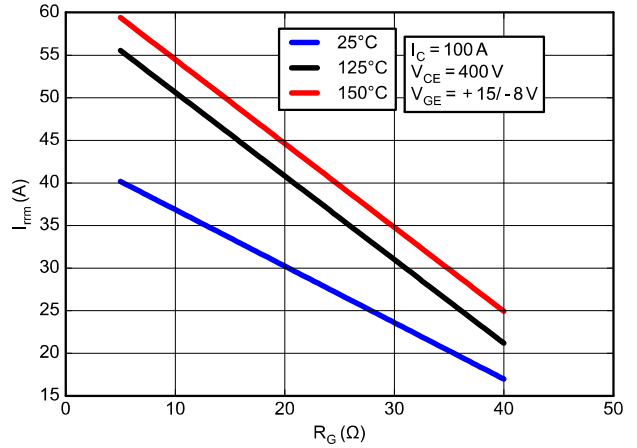


Figure 69. Typical Reverse Recovery Current vs. R_G

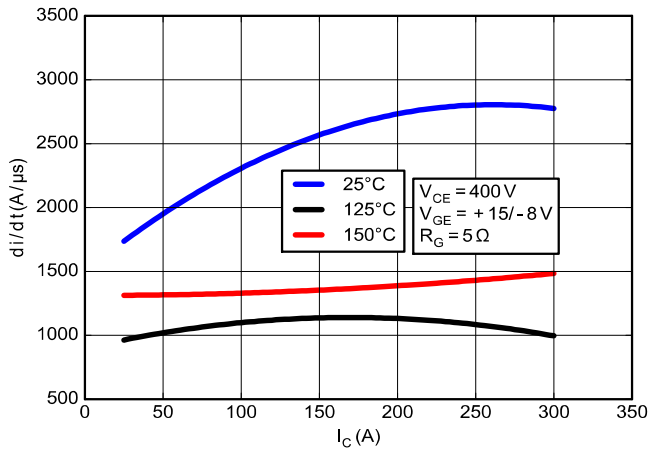


Figure 70. Typical di/dt vs. I_C

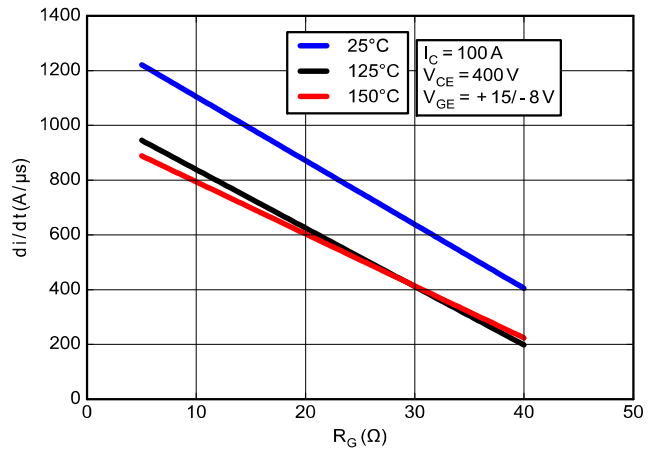


Figure 71. Typical di/dt vs. R_G

SNXH100M65L3Q2F2PG, SNXH100M65L4Q2F2P2G-N1

TYPICAL CHARACTERISTICS – T1/T4 IGBT COMUTATES D5/D6 DIODE

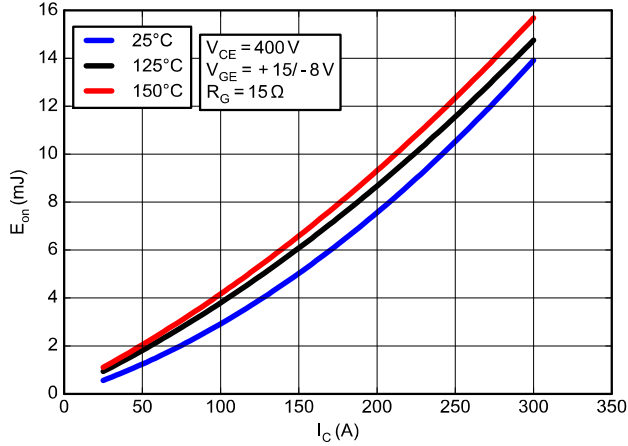


Figure 72. Typical Switching Energy Eon vs. IC

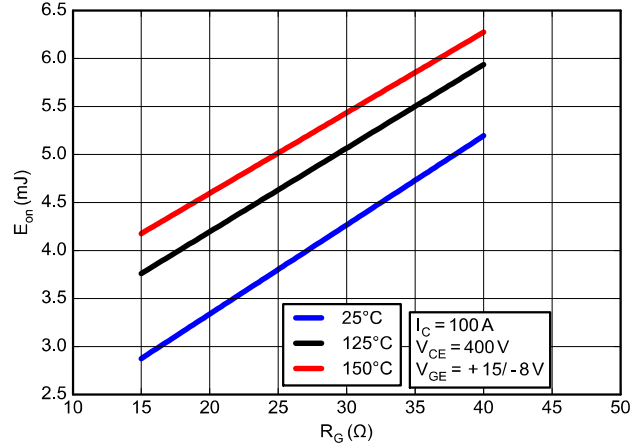


Figure 73. Typical Switching Energy Eon vs. R_G

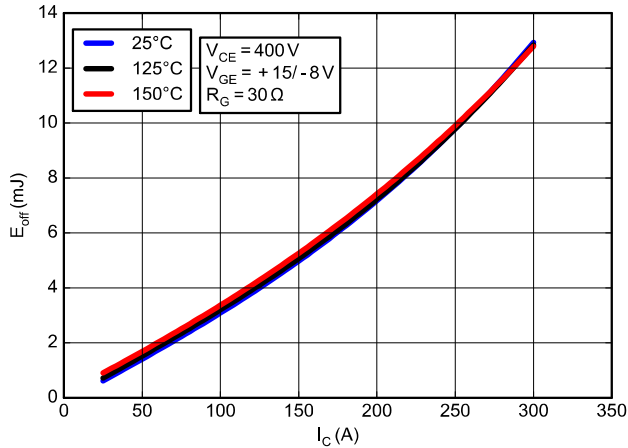


Figure 74. Typical Switching Energy Eoff vs. IC

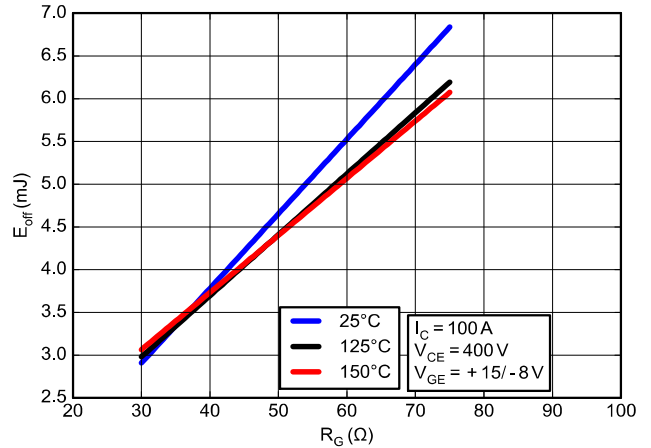


Figure 75. Typical Switching Energy Eoff vs. R_G

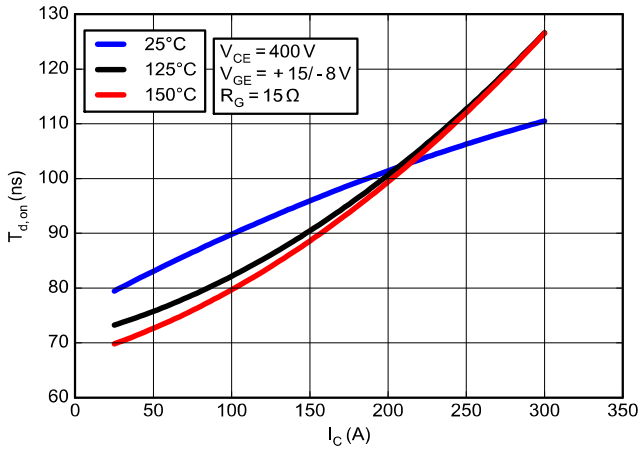


Figure 76. Typical Switching Time Tdon vs. IC

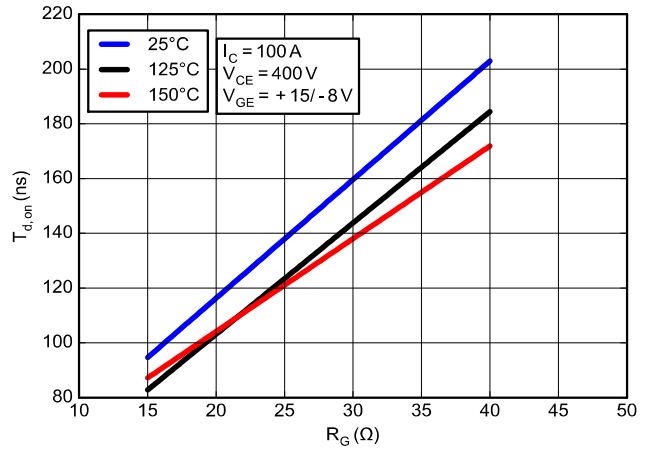


Figure 77. Typical Switching Time Tdon vs. R_G

SNXH100M65L3Q2F2PG, SNXH100M65L4Q2F2P2G-N1

TYPICAL CHARACTERISTICS – T1/T4 IGBT COMUTATES D5/D6 DIODE

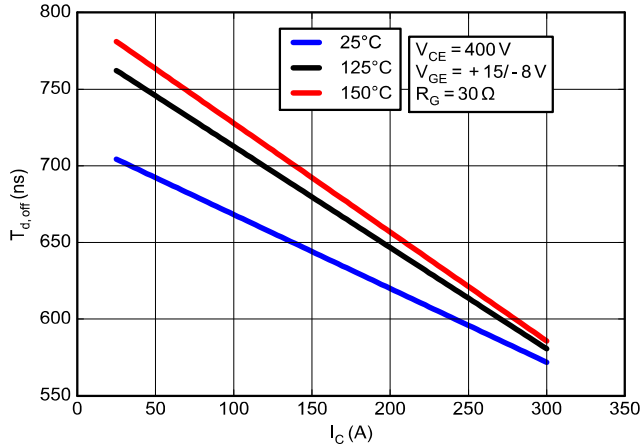


Figure 78. Typical Switching Time Tdoff vs. IC

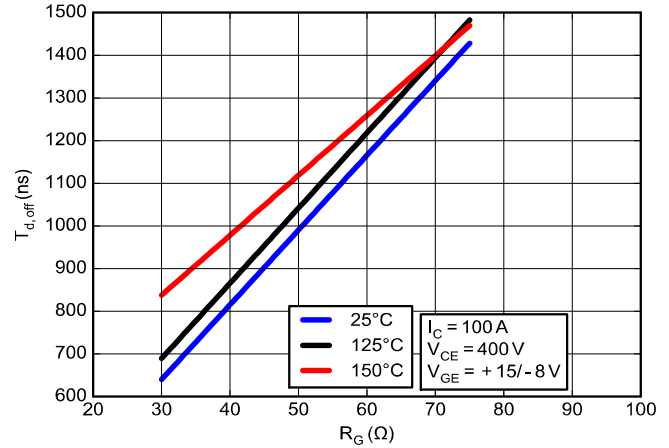


Figure 79. Typical Switching Time Tdoff vs. RG

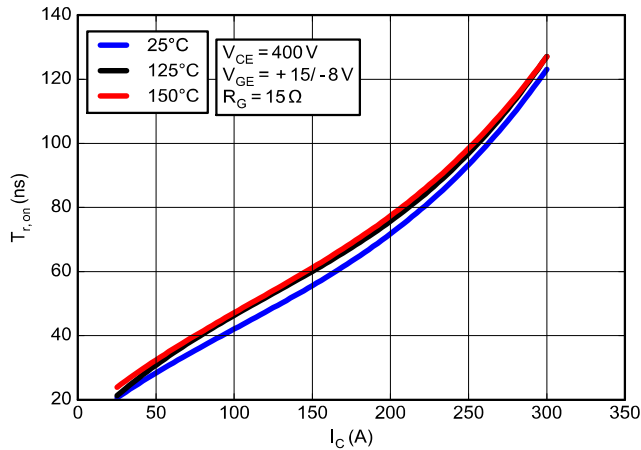


Figure 80. Typical Switching Time Tr vs. IC

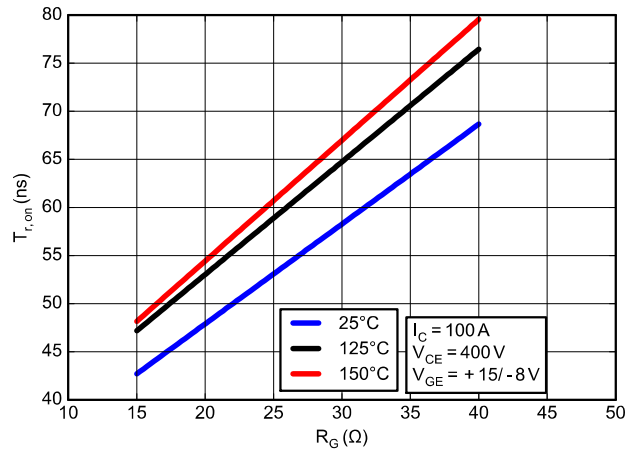


Figure 81. Typical Switching Time Tr vs. RG

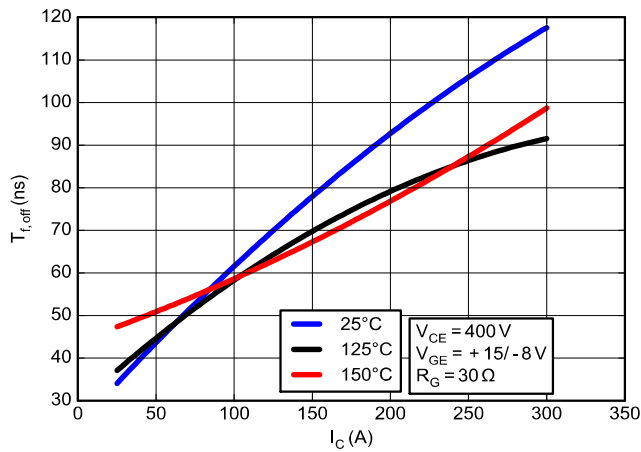


Figure 82. Typical Switching Time Tf vs. IC

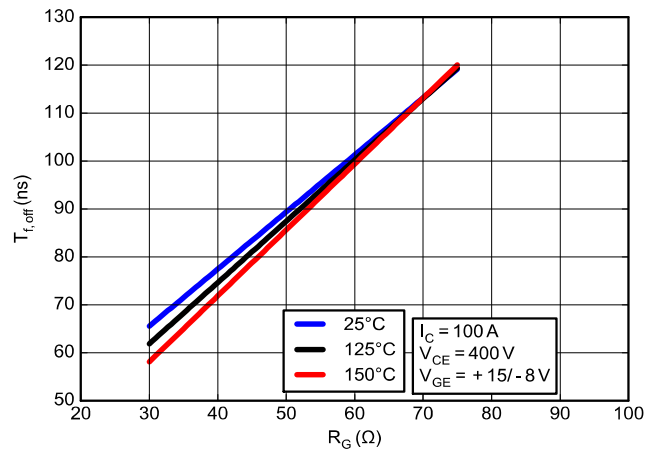


Figure 83. Typical Switching Time Tf vs. RG

TYPICAL CHARACTERISTICS – T1/T4 IGBT COMUTATES D5/D6 DIODE

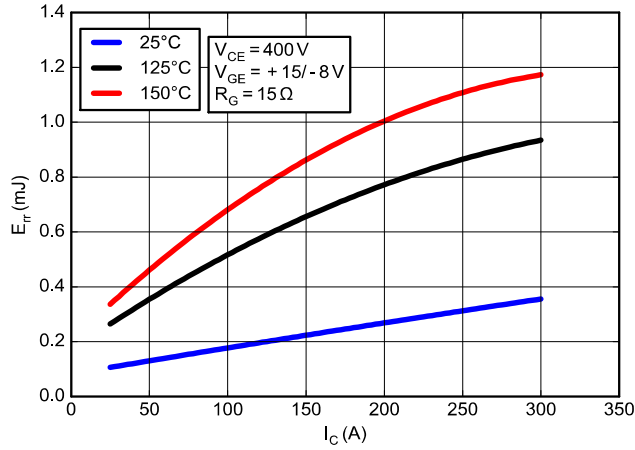


Figure 84. Typical Reverse Recovery Energy vs. I_C

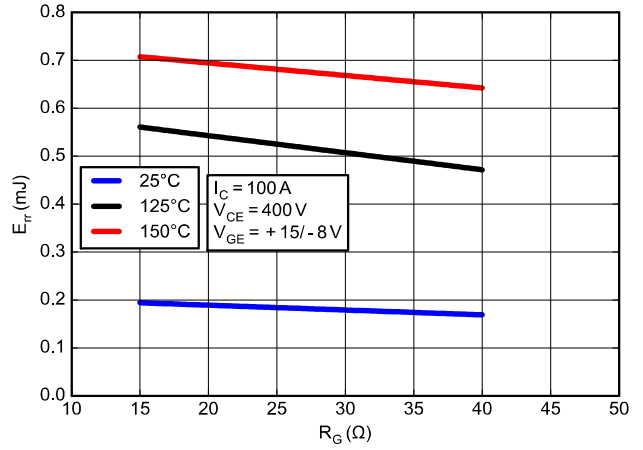


Figure 85. Typical Reverse Recovery Energy vs. R_G

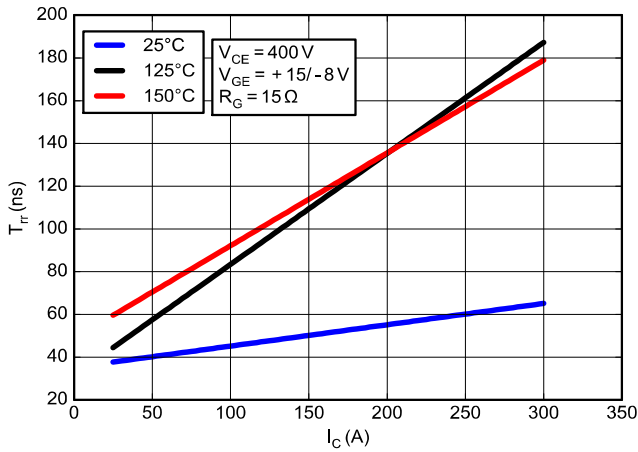


Figure 86. Typical Reverse Recovery Time vs. I_C

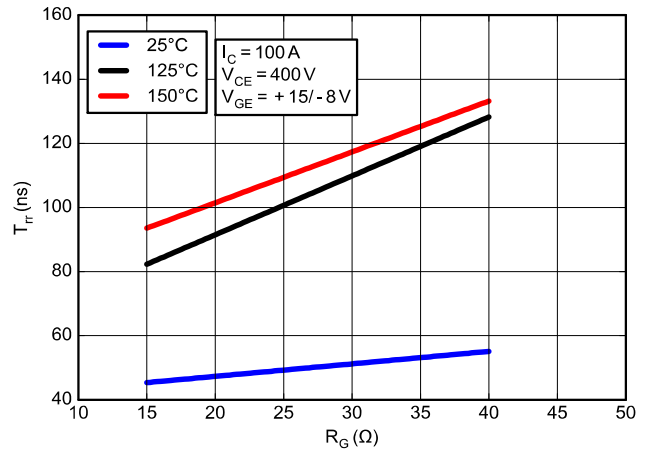


Figure 87. Typical Reverse Recovery Time vs. R_G

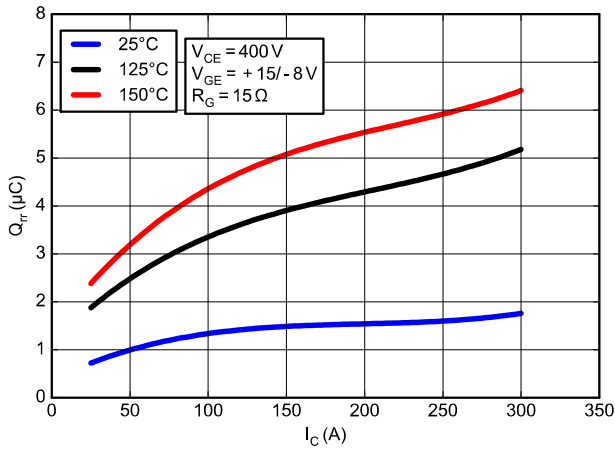


Figure 88. Typical Reverse Recovery Charge vs. I_C

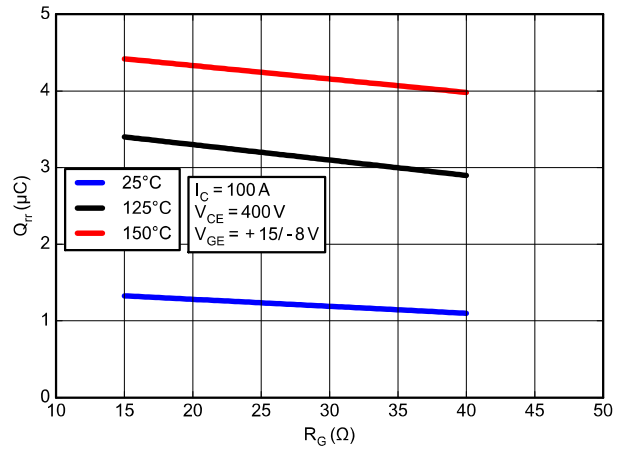


Figure 89. Typical Reverse Recovery Charge vs. R_G

SNXH100M65L3Q2F2PG, SNXH100M65L4Q2F2P2G-N1

TYPICAL CHARACTERISTICS – T1/T4 IGBT COMUTATES D5/D6 DIODE

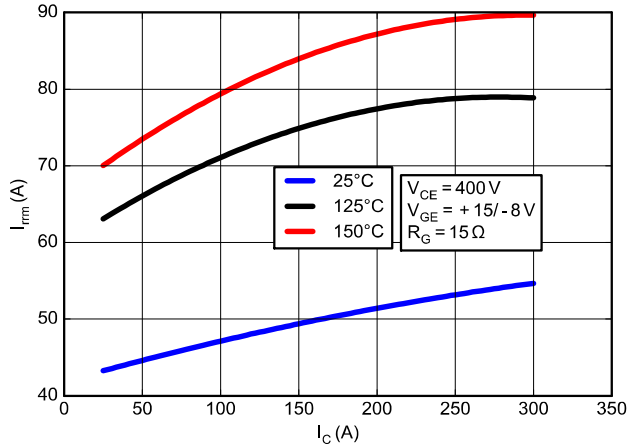


Figure 90. Typical Reverse Recovery Current vs. I_C

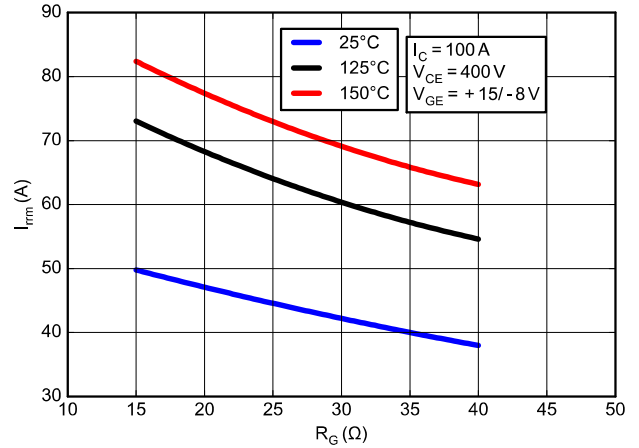


Figure 91. Typical Reverse Recovery Current vs. R_G

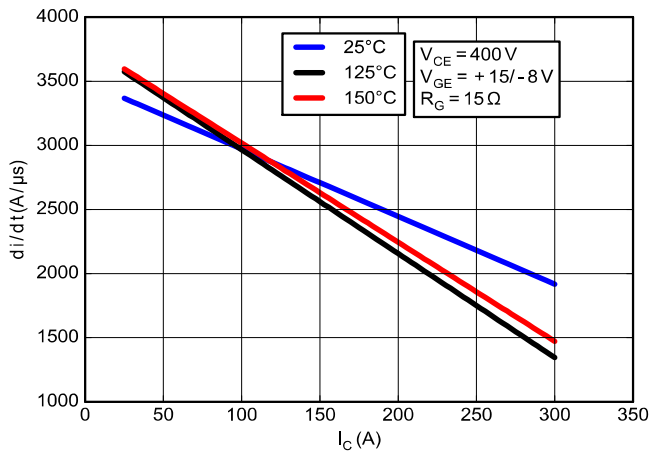


Figure 92. Typical di/dt vs. I_C

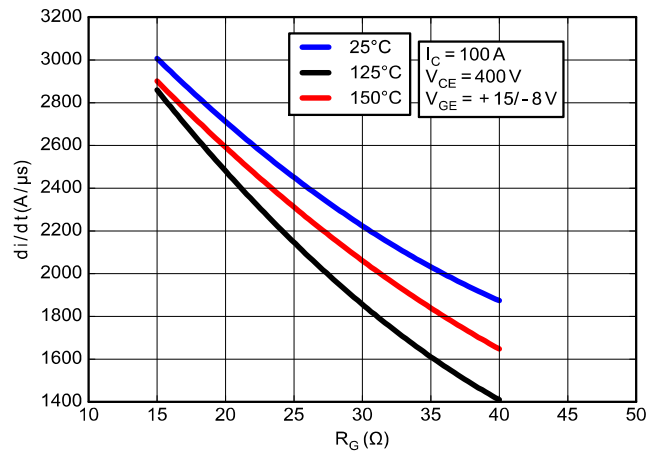


Figure 93. Typical di/dt vs. R_G

SNXH100M65L3Q2F2PG, SNXH100M65L4Q2F2P2G-N1

TYPICAL CHARACTERISTICS – T5/T6 IGBT COMMUTATES D1/D4 DIODE

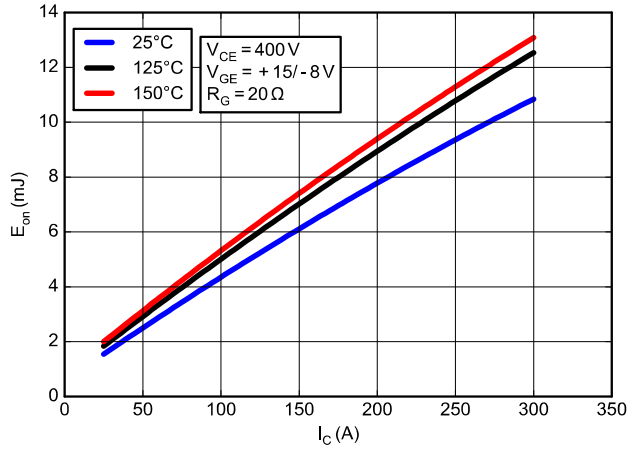


Figure 94. Typical Switching Energy Eon vs. IC

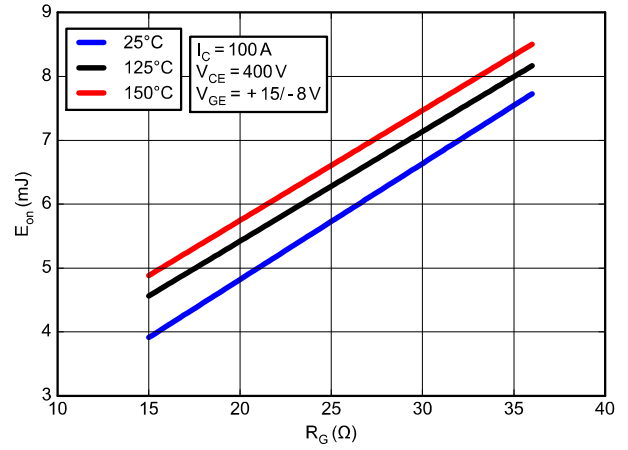


Figure 95. Typical Switching Energy Eon vs. R_G

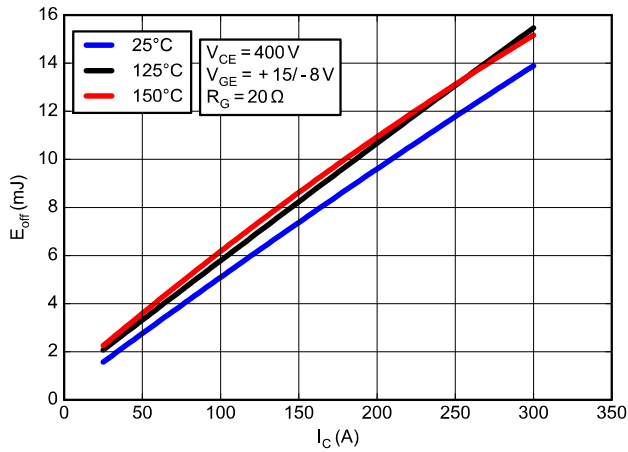


Figure 96. Typical Switching Energy Eoff vs. IC

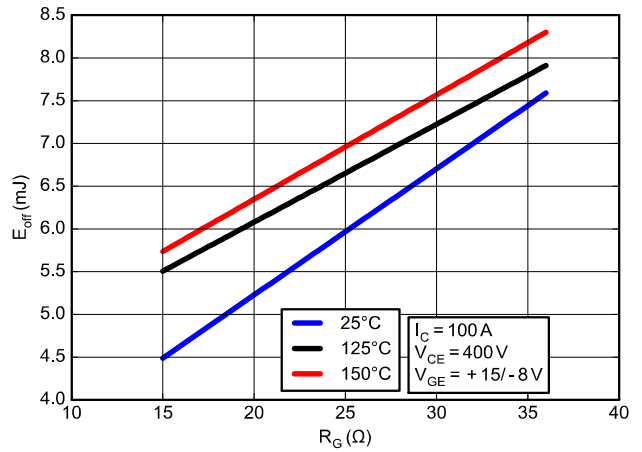


Figure 97. Typical Switching Energy Eoff vs. R_G

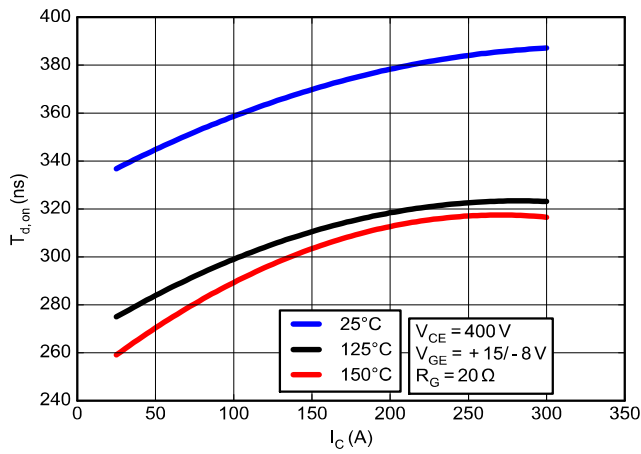


Figure 98. Typical Switching Time Tdon vs. IC

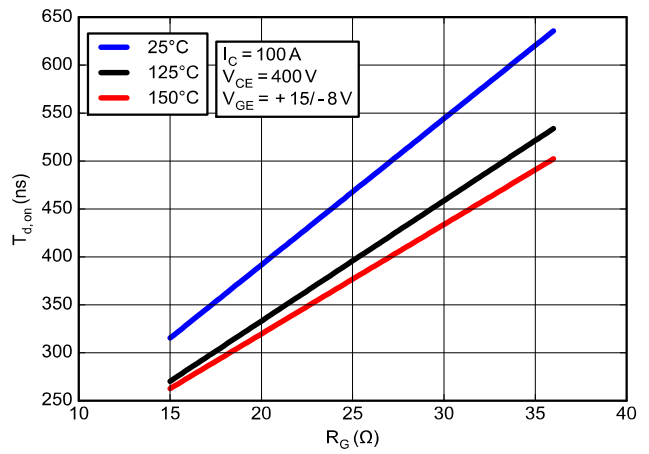


Figure 99. Typical Switching Time Tdon vs. R_G

SNXH100M65L3Q2F2PG, SNXH100M65L4Q2F2P2G-N1

TYPICAL CHARACTERISTICS – T5/T6 IGBT COMUTATES D1/D4 DIODE

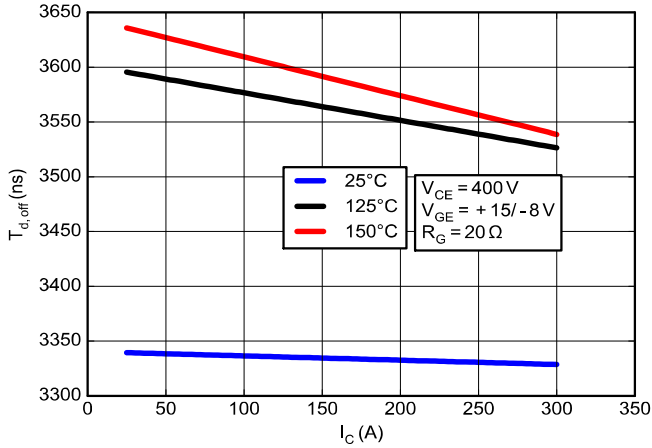


Figure 100. Typical Switching Time Tdoff vs. IC

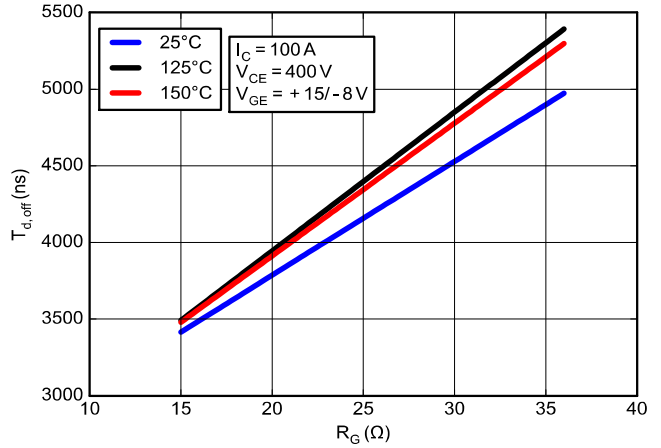


Figure 101. Typical Switching Time Tdoff vs. RG

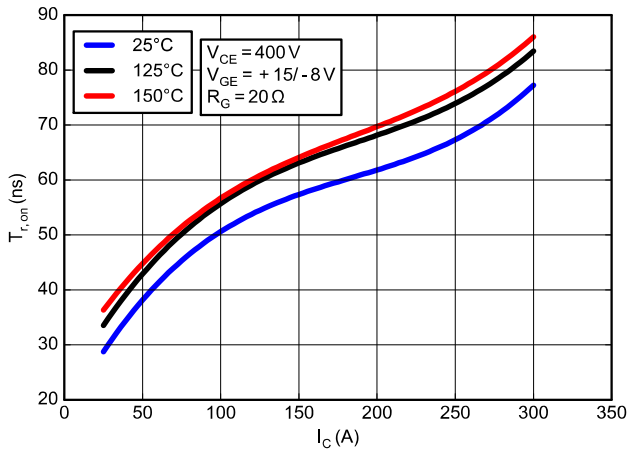


Figure 102. Typical Switching Time Tr vs. IC

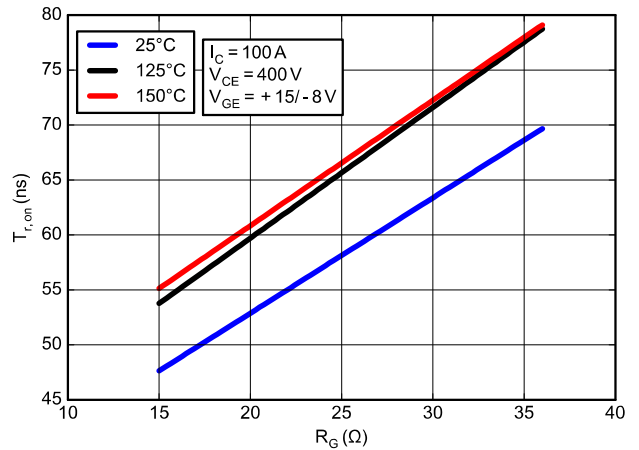


Figure 103. Typical Switching Time Tr vs. RG

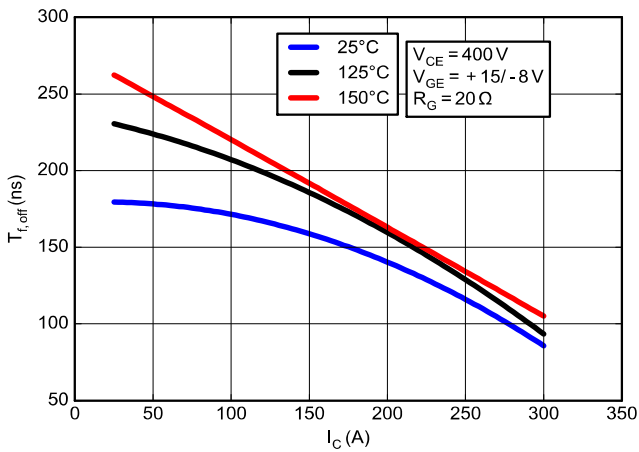


Figure 104. Typical Switching Time Tf vs. IC

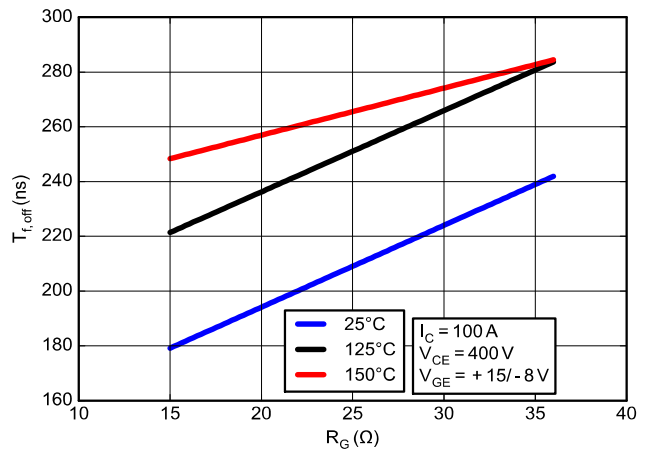


Figure 105. Typical Switching Time Tf vs. RG

TYPICAL CHARACTERISTICS – T5/T6 IGBT COMUTATES D1/D4 DIODE

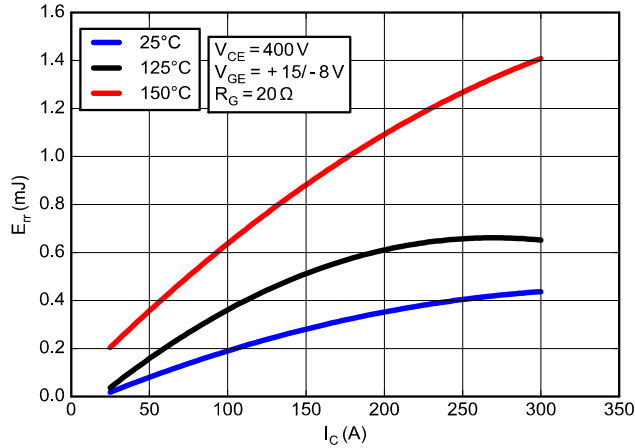


Figure 106. Typical Reverse Recovery Energy vs. IC

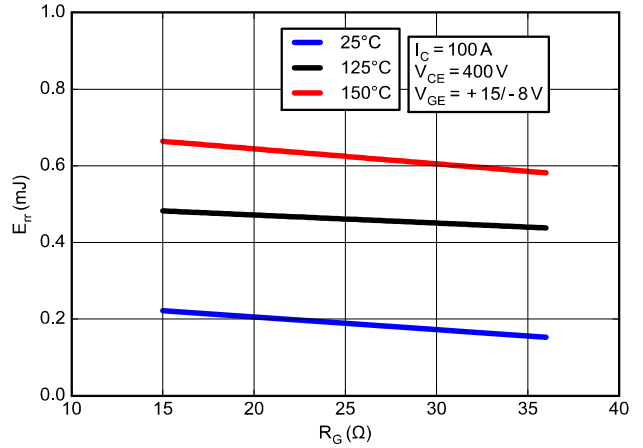


Figure 107. Typical Reverse Recovery Energy vs. R_G

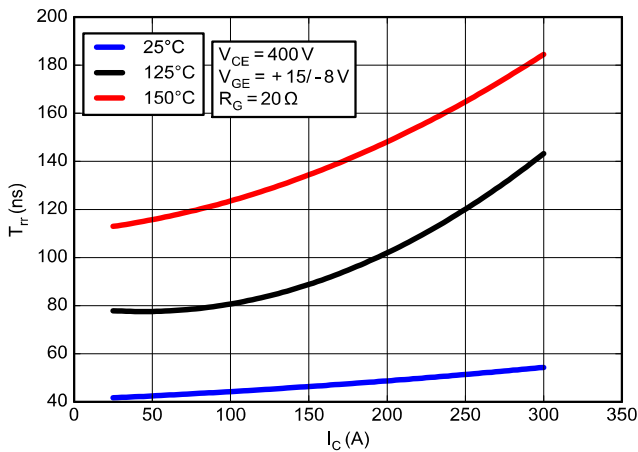


Figure 108. Typical Reverse Recovery Time vs. IC

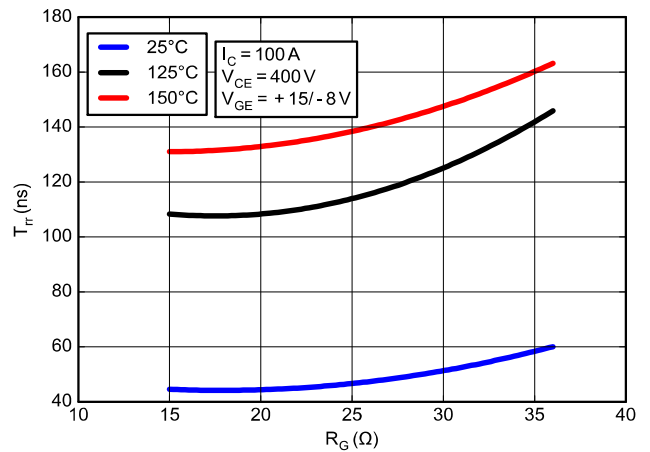


Figure 109. Typical Reverse Recovery Time vs. R_G

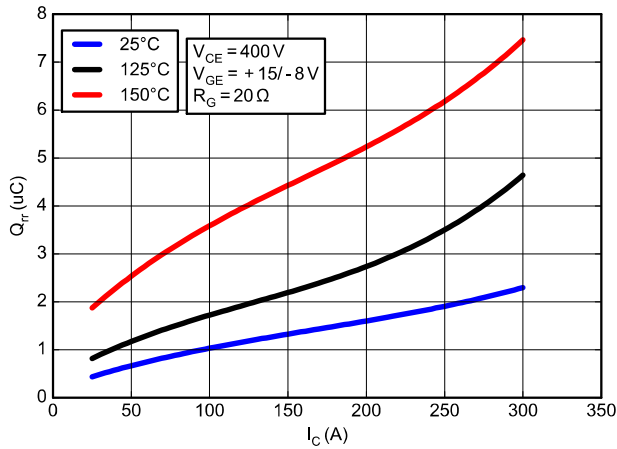


Figure 110. Typical Reverse Recovery Charge vs. IC

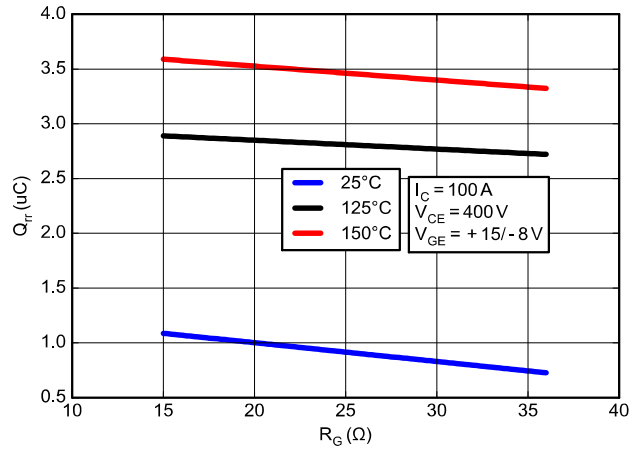


Figure 111. Typical Reverse Recovery Charge vs. R_G

SNXH100M65L3Q2F2PG, SNXH100M65L4Q2F2P2G-N1

TYPICAL CHARACTERISTICS – T5/T6 IGBT COMUTATES D1/D4 DIODE

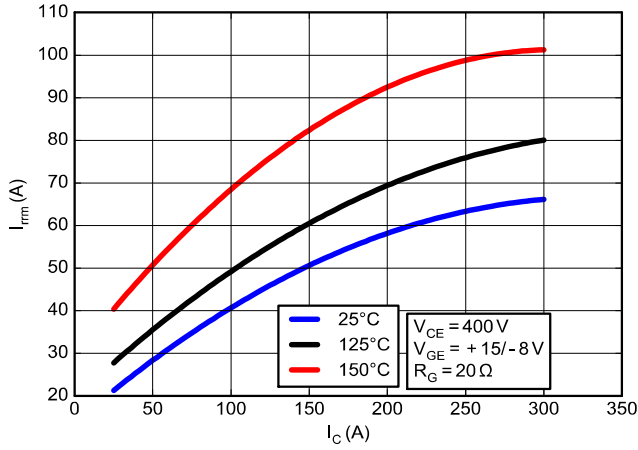


Figure 112. Typical Reverse Recovery Current vs. I_C

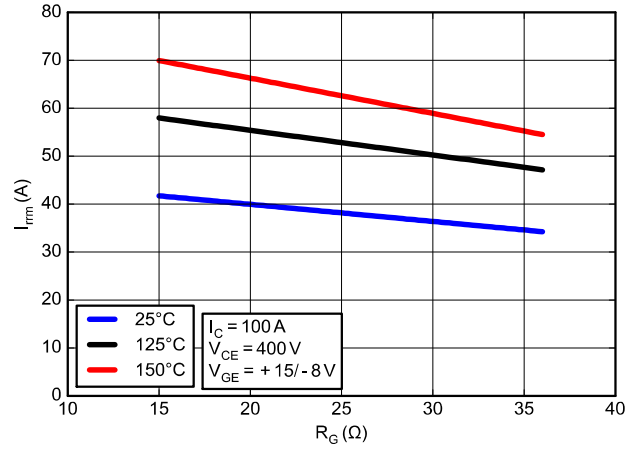


Figure 113. Typical Reverse Recovery Current vs. R_G

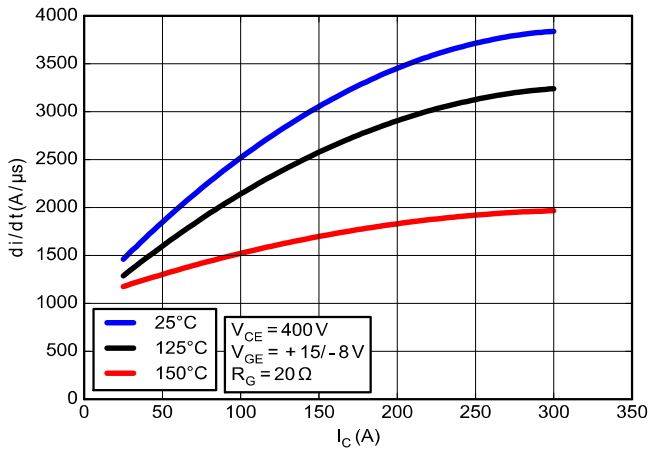


Figure 114. Typical di/dt vs. I_C

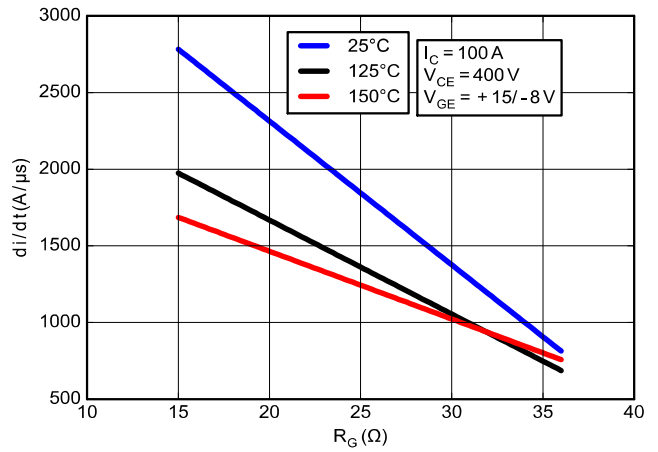


Figure 115. Typical di/dt vs. R_G

SNXH100M65L3Q2F2PG, SNXH100M65L4Q2F2P2G-N1

TYPICAL SWITCHING DEFINITION – T1/T4 IGBT COMMUTATES D2/D3 DIODE

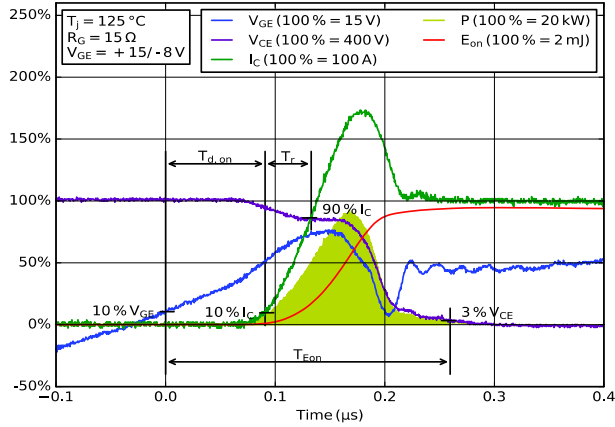


Figure 116. Turn-On Switching Definition Waveform

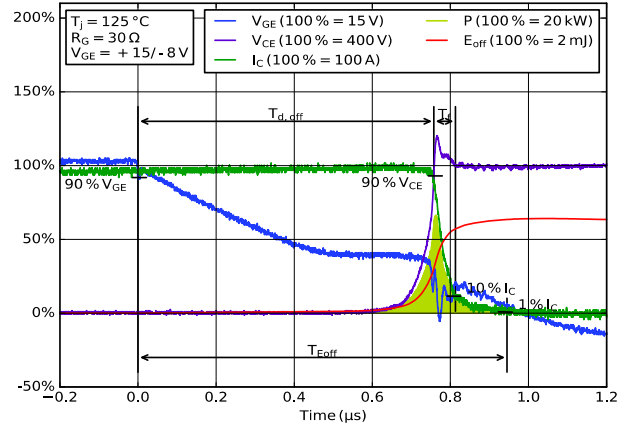


Figure 117. Turn-Off Switching Definition Waveform

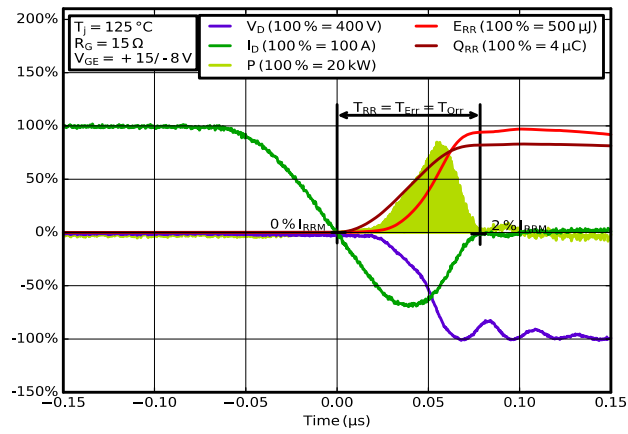


Figure 118. Reverse Recovery Switching Definition Waveform

SNXH100M65L3Q2F2PG, SNXH100M65L4Q2F2P2G-N1

TYPICAL SWITCHING DEFINITION – T2/T3 IGBT COMUTATES D1/D4 DIODE

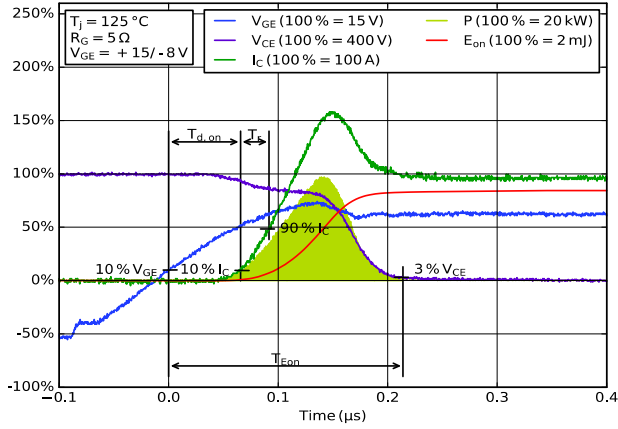


Figure 119. Turn-On Switching Definition Waveform

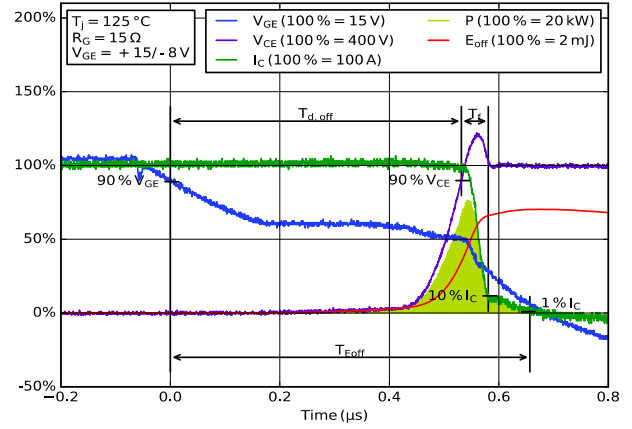


Figure 120. Turn-Off Switching Definition Waveform

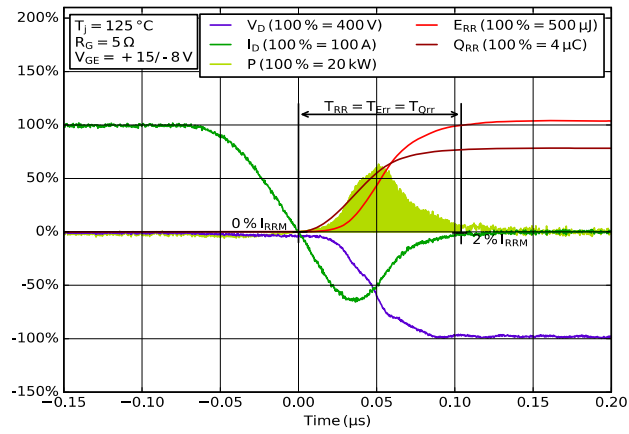


Figure 121. Reverse Recovery Switching Definition Waveform

SNXH100M65L3Q2F2PG, SNXH100M65L4Q2F2P2G-N1

TYPICAL SWITCHING DEFINITION – T1/T4 IGBT COMMUTATES D5/D6 DIODE

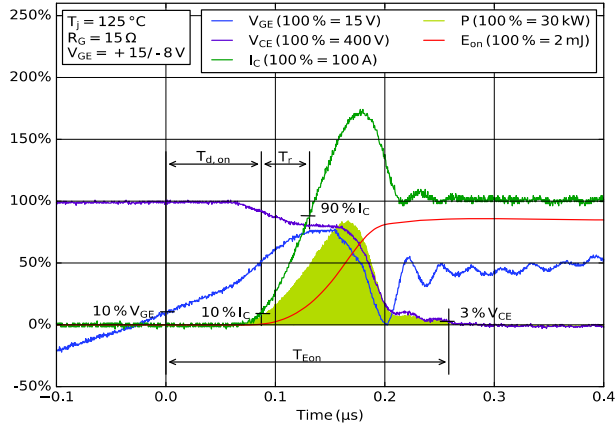


Figure 122. Turn-On Switching Definition Waveform

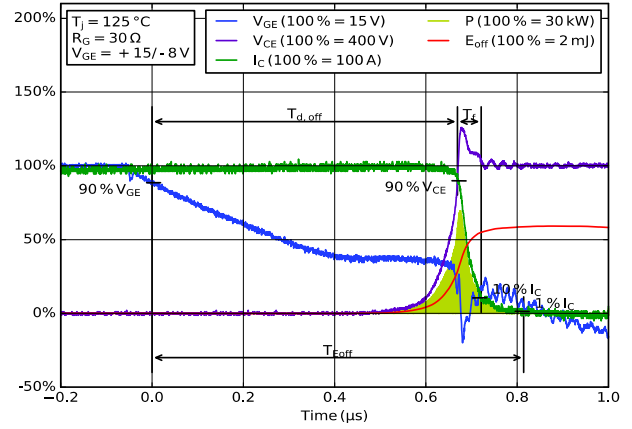


Figure 123. Turn-Off Switching Definition Waveform

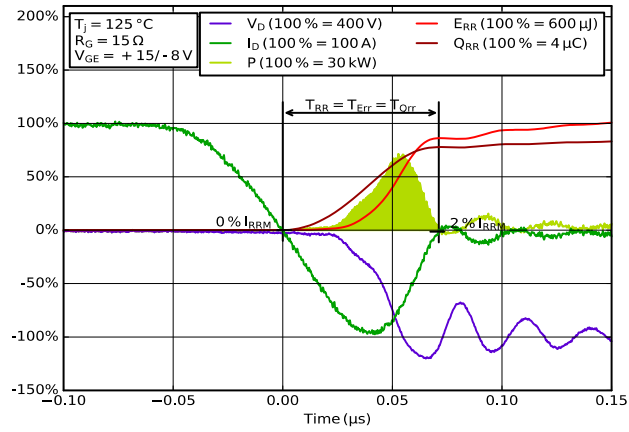


Figure 124. Reverse Recovery Switching Definition Waveform

SNXH100M65L3Q2F2PG, SNXH100M65L4Q2F2P2G-N1

TYPICAL SWITCHING DEFINITION – T5/T6 IGBT COMMUTATES D1/D4 DIODE

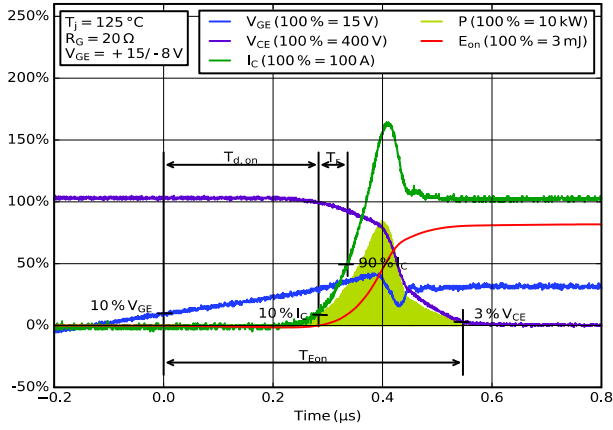


Figure 125. Turn-On Switching Definition Waveform

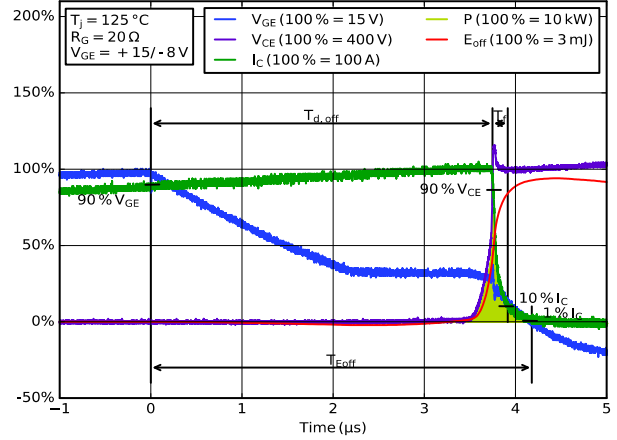


Figure 126. Turn-Off Switching Definition Waveform

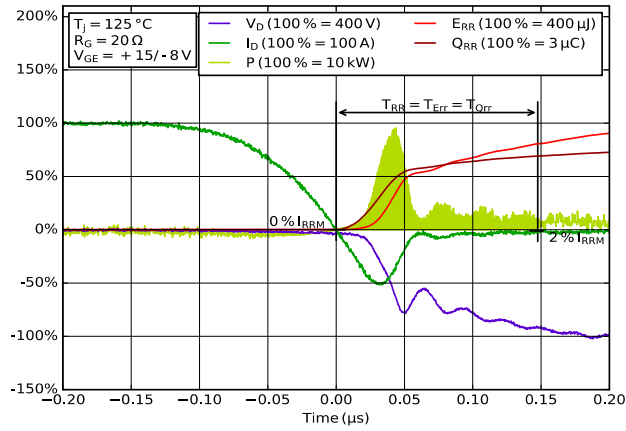
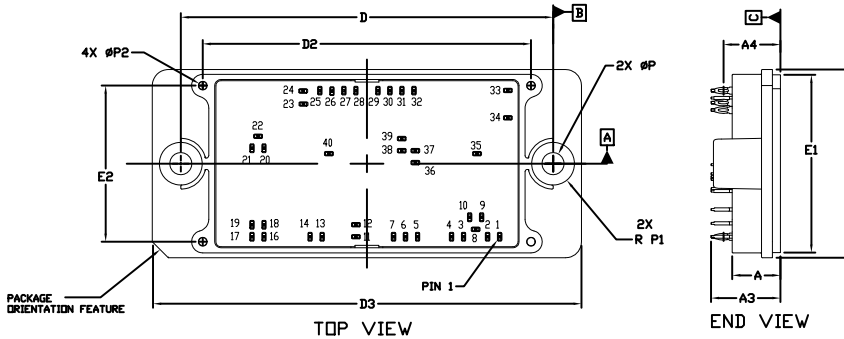


Figure 127. Reverse Recovery Switching Definition Waveform

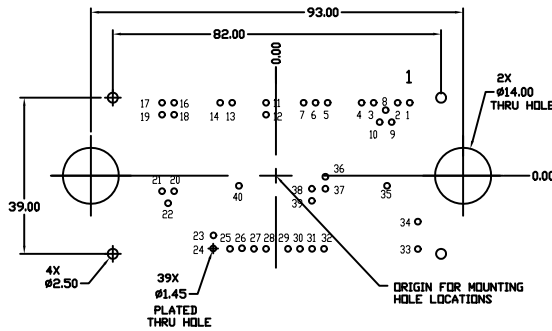
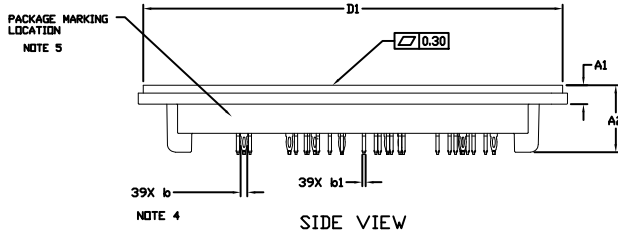
SNXH100M65L3Q2F2PG, SNXH100M65L4Q2F2P2G-N1

PACKAGE DIMENSIONS

PIM40, 93x47 (PRESS FIT)
CASE 180AG
ISSUE D



DIM	MILLIMETERS		
	MIN.	NOM.	MAX.
A	11.60	12.00	12.40
A1	4.40	4.70	5.00
A2	16.30	16.70	17.10
A3	16.90	17.30	17.70
A4	13.97	14.18	14.39
b	1.61	1.66	1.71
b1	0.75	0.80	0.85
D	92.90	93.00	93.10
D1	104.45	104.75	105.05
D2	81.80	82.00	82.20
D3	106.90	107.20	107.50
E	46.70	47.00	47.30
E1	44.10	44.40	44.70
E2	38.80	39.00	39.20
P	5.40	5.50	5.60
P1	5.15	5.35	5.55
P2	2.00	2.20	2.40



RECOMMENDED MOUNTING PATTERN


NOTES:

- DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2009.
- CONTROLLING DIMENSION: MILLIMETERS
- DIMENSIONS b and b1 APPLY TO THE PLATED TERMINALS AND ARE MEASURED AT DIMENSION A4.
- 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.
- PACKAGE MARKING IS LOCATED AS SHOWN ON THE SIDE OPPOSITE THE PACKAGE ORIENTATION FEATURES.
- PIN IDENTIFIER 15 IS SKIPPED. TOTAL NUMBER OF PINS IS 39.

NOTE 4

PIN	PIN POSITION		PIN	PIN POSITION		MOUNTING HOLE POSITION			MOUNTING HOLE POSITION		
	X	Y		X	Y	PIN	X	Y	PIN	X	Y
1	33.15	-18.25	22	-27.20	6.85	1	33.15	18.25	22	-27.20	-6.85
2	30.15	-18.25	23	-15.85	14.90	2	30.15	18.25	23	-15.85	-14.90
3	24.15	-18.25	24	-15.85	18.25	3	24.15	18.25	24	-15.85	-18.25
4	21.15	-18.25	25	-11.75	18.25	4	21.15	18.25	25	-11.75	-18.25
5	12.65	-18.25	26	-8.75	18.25	5	12.65	18.25	26	-8.75	-18.25
6	9.65	-18.25	27	-5.75	18.25	6	9.65	18.25	27	-5.75	-18.25
7	6.65	-18.25	28	-2.75	18.25	7	6.65	18.25	28	-2.75	-18.25
8	27.15	-16.40	29	2.75	18.25	8	27.15	16.40	29	2.75	-18.25
9	28.65	-13.40	30	5.75	18.25	9	28.65	13.40	30	5.75	-18.25
10	25.65	-13.40	31	8.75	18.25	10	25.65	13.40	31	8.75	-18.25
11	-2.75	-18.25	32	11.75	18.25	11	-2.75	18.25	32	11.75	-18.25
12	-2.75	-15.25	33	35.20	18.30	12	-2.75	15.25	33	35.20	-18.30
13	-11.20	-18.25	34	35.20	11.45	13	-11.20	18.25	34	35.20	-11.45
14	-14.20	-18.25	35	27.50	2.50	14	-14.20	18.25	35	27.50	-2.50
16	-25.70	-18.25	36	12.10	0.25	16	-25.70	18.25	36	12.10	-0.25
17	-28.70	-18.25	37	12.10	3.25	17	-28.70	18.25	37	12.10	-3.25
18	-25.70	-15.25	38	8.70	3.25	18	-25.70	15.25	38	8.70	-3.25
19	-28.70	-15.25	39	8.70	6.25	19	-28.70	15.25	39	8.70	-6.25
20	-25.70	3.85	40	-9.50	2.50	20	-25.70	-3.85	40	-9.50	-2.50
21	-28.70	3.85	TOLERANCE +/- 0.40			21	-28.70	-3.85			

SNXH100M65L3Q2F2PG, SNXH100M65L4Q2F2P2G-N1

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