SNXH100M95H3Q2F2PG

Q2PACK Module

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

ON Semiconductor®

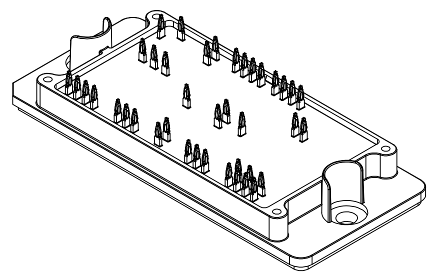
www.onsemi.com

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



Q2PACK
CASE 180AM

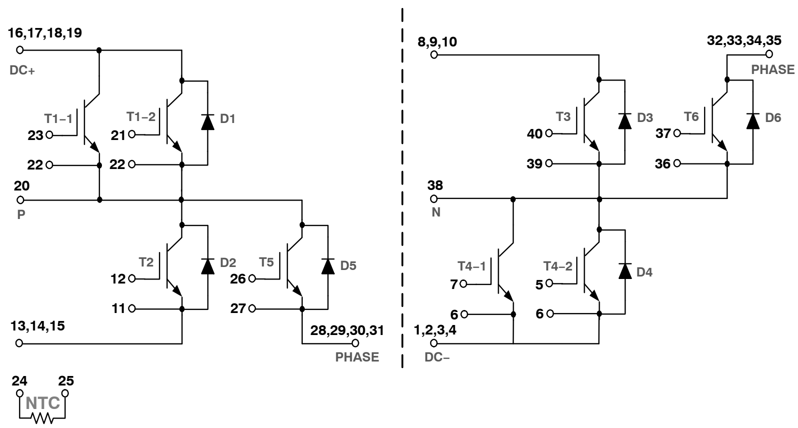
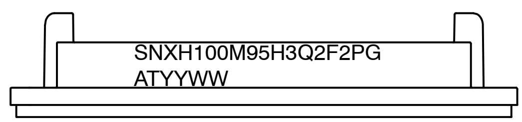


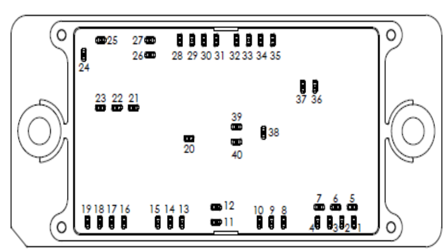
Figure 1. SNXH100M95H3Q2F2PG Schematic Diagram

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.

Table 1. MAXIMUM RATINGS

Rating	Symbol	Value	Unit
IGBT (T1–1, T1–2, T4–1, T4–2)			
Collector–emitter voltage	V_{CES}	950	V
Collector current @ Th = 80°C	I_C	85	A
Pulsed Peak Collector Current @ Tpulse = 1 ms	I_{CM}	255	A
Power Dissipation (Tj = Tjmax, Th = 80°C)	P_{tot}	193	W
Gate–emitter voltage Positive transient gate–emitter voltage (Tpulse = 5 μs, D < 0.10)	V_{GE}	±20 30	V
Maximum Junction Temperature (Note 1)	T_{Jmax}	175	°C
IGBT (T2, T3)			
Collector–emitter voltage	V_{CES}	950	V
Collector current @ Th = 80°C	I_C	92	A
Pulsed Peak Collector Current @ Tpulse = 1 ms	I_{CM}	276	A
Power Dissipation (Tj = Tjmax, Th = 80°C)	P_{tot}	220	W
Gate–emitter voltage Positive transient gate–emitter voltage (Tpulse = 5 μs, D < 0.10)	V_{GE}	±20 30	V
Maximum Junction Temperature (Note 1)	T_{Jmax}	175	°C
IGBT (T5, T6)			
Collector–emitter voltage	V_{CES}	950	V
Collector current @ Th = 80°C	I_C	263	A
Pulsed Peak Collector Current @ Tpulse = 1 ms	I_{CM}	789	A
Power Dissipation (Tj = Tjmax Th = 80°C)	P_{tot}	457	W
Gate–emitter voltage Positive transient gate–emitter voltage (Tpulse = 5 μs, D < 0.10)	V_{GE}	±20 30	V
Maximum Junction Temperature (Note 1)	T_{Jmax}	175	°C
INVERSE DIODE (D1, D4, D5, D6)			
Peak Repetitive Reverse Voltage	V_{RRM}	950	V
Forward Current, DC @ Th = 80°C	I_F	111	A
Repetitive Peak Forward Current, Tpulse = 1 ms	I_{FRM}	333	A
Power Dissipation (T_J = T_{JMAX} T_h = 80°C)	P_{tot}	240	W
Maximum Junction Temperature (Note 1)	T_J	175	°C
INVERSES DIODE (D2, D3)			
Peak Repetitive Reverse Voltage	V_{RRM}	1200	V
Forward Current, DC @ Th = 80°C	I_F	60	A
Repetitive Peak Forward Current, Tpulse = 1 ms	I_{FRM}	180	A
Power Dissipation (T_J = T_{JMAX} T_h = 80°C)	P_{tot}	173	W
Maximum Junction Temperature (Note 1)	T_J	175	°C
THERMAL PROPERTIES			
Operating Temperature under switching condition	$T_{VJ\,OP}$	–40 to (T_{jmax}–25)	°C
Storage Temperature range	T_{stg}	–40 to 125	°C
INSULATION PROPERTIES			
Isolation voltage, t = 1 min, 50/60 Hz	V_{is}	3400	V_{RMS}
Creepage distance		12.7	mm
Comparative tracking index	CTI	>600	

1. Rated per discrete TO247 qualification

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

Table 2. ELECTRICAL CHARACTERISTICS (T_J = 25°C unless otherwise specified)

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
IGBT (T1−1, T1−2, T4−1, T4−2)						
Collector−emitter Breakdown Voltage	V_{GE} = 0 V, I_C = 1.7 mA	BV_{CES}	950	–	–	V
Collector−emitter saturation voltage (pin−to−pin)	V_{GE} = 15 V, I_C = 150 A, T_J = 25°C V_{GE} = 15 V, I_C = 150 A, T_J = 150°C	$V_{CE(sat)}$	–	1.80 2.1	2.25 –	V
Gate−emitter threshold voltage	V_{GE} = V_{CE}, I_C = 150 mA	$V_{GE(TH)}$	4.1	4.7	5.7	V
Collector−emitter cutoff current	V_{GE} = 0 V, V_{CE} = 950 V (Note 2)	I_{CES}	–	–	400	μA
Gate leakage current	V_{GE} = 20 V, V_{CE} = 0 V	I_{GES}	–	–	800	nA
Turn−on delay time	Tj = 25°C V_{CE} = 600 V, I_C = 75 A V_{GE} = −8 V to +15 V, $R_{G(on)}$ = 15 Ω (Note 2)	$t_{d(on)}$	–	106	–	ns
Rise time		t_r	–	43	–	
Turn−off delay time		$t_{d(off)}$	–	591	–	
Fall time		t_f	–	50	–	
Turn on switching loss		E_{on}	–	2.77	–	mJ
Turn off switching loss		E_{off}	–	2.51	–	
Turn−on delay time	Tj = 125°C V_{CE} = 600 V, I_C = 75 A V_{GE} = −8 V to +15 V, $R_{G(on)}$ = 15 Ω (Note 2)	$t_{d(on)}$	–	96	–	ns
Rise time		t_r	–	47	–	
Turn−off delay time		$t_{d(off)}$	–	648	–	
Fall time		t_f	–	83	–	
Turn on switching loss		E_{on}	–	3.54	–	mJ
Turn off switching loss		E_{off}	–	3.59	–	
Input capacitance	V_{CE} = 20 V, V_{GE} = 0 V, f = 10 kHz	C_{ies}	–	9546	–	pF
Output capacitance		C_{oes}	–	241	–	
Reverse transfer capacitance		C_{res}	–	54	–	
Gate charge total	V_{CE} = 600 V, I_C = 150 A, V_{GE} = 15 V	Q_g	–	285	–	nC
Thermal Resistance − chip−to−heatsink	Thermal grease, Thickness = 2.1 Mil ± 2%, λ = 2.9 W/mK	R_{thJH}	–	0.49	–	°C/W
IGBT (T2, T3)						
Collector−emitter Breakdown Voltage	V_{GE} = 0 V, I_C = 1.35 mA	BV_{CES}	950	–	–	V
Collector−emitter saturation voltage (pin−to−pin)	V_{GE} = 15 V, I_C = 150 A, T_J = 25°C V_{GE} = 15 V, I_C = 150 A, T_J = 150°C	$V_{CE(sat)}$	– –	1.78 2.06	2.25 –	V
Gate−emitter threshold voltage	V_{GE} = V_{CE}, I_C = 150 mA	$V_{GE(TH)}$	4.1	4.65	5.7	V
Collector−emitter cutoff current	V_{GE} = 0 V, V_{CE} = 950 V	I_{CES}	–	–	200	μA
Gate leakage current	V_{GE} = 20 V, V_{CE} = 0 V	I_{GES}	–	–	800	nA
Turn−on delay time	Tj = 25°C V_{CE} = 600 V, I_C = 75 A V_{GE} = −8 V to +15 V, $R_{G(on)}$ = 15 Ω, $R_{G(off)}$ = 20 Ω	$t_{d(on)}$	–	72	–	ns
Rise time		t_r	–	33	–	
Turn−off delay time		$t_{d(off)}$	–	384	–	
Fall time		t_f	–	15	–	
Turn on switching loss		E_{on}	–	3.68	–	mJ
Turn off switching loss		E_{off}	–	2.04	–	
Turn−on delay time	Tj = 125°C V_{CE} = 600 V, I_C = 75 A V_{GE} = −8 V to +15 V, $R_{G(on)}$ = 15 Ω, $R_{G(off)}$ = 20 Ω	$t_{d(on)}$	–	65	–	ns
Rise time		t_r	–	36	–	
Turn−off delay time		$t_{d(off)}$	–	439	–	
Fall time		t_f	–	28	–	
Turn on switching loss		E_{on}	–	6.39	–	mJ
Turn off switching loss		E_{off}	–	3.14	–	

2. Rated per T1/T4 IGBTs

Table 2. ELECTRICAL CHARACTERISTICS (T_J = 25°C unless otherwise specified)

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
IGBT (T2, T3)						
Input capacitance	V_{CE} = 20 V, V_{GE} = 0 V, f = 10 kHz	C_{ies}	–	9546	–	pF
Output capacitance		C_{oes}	–	241	–	
Reverse transfer capacitance		C_{res}	–	54	–	
Gate charge total	V_{CE} = 600 V, I_C = 150 A, V_{GE} = 15 V	Q_g	–	285	–	nC
Thermal Resistance – chip–to–heatsink	Thermal grease, Thickness = 2.1 Mil ± 2%, λ = 2.9 W/mK	R_{thJH}	–	0.43	–	°C/W
IGBT (T5, T6)						
Collector–emitter Breakdown Voltage	V_{GE} = 0 V, I_C = 1.55 mA	BV_{CES}	950	–	–	V
Collector–emitter saturation voltage (pin–to–pin)	V_{GE} = 15 V, I_C = 300 A, T_J = 25°C V_{GE} = 15 V, I_C = 300 A, T_J = 150°C	$V_{CE(sat)}$	– –	1.45 1.51	1.75 –	V
Gate–emitter threshold voltage	V_{GE} = V_{CE}, I_C = 300 mA	$V_{GE(TH)}$	4.1	4.72	5.7	V
Collector–emitter cutoff current	V_{GE} = 0 V, V_{CE} = 950 V	I_{CES}		–	400	μA
Gate leakage current	V_{GE} = 20 V, V_{CE} = 0 V	I_{GES}	–	–	1.6	μA
Turn–on delay time	Tj = 25°C V_{CE} = 600 V, I_C = 75 A V_{GE} = –8 V to +15 V, R_G = 25 Ω	$t_{d(on)}$	–	275	–	ns
Rise time		t_r	–	71	–	
Turn–off delay time		$t_{d(off)}$	–	1182	–	
Fall time		t_f	–	124	–	
Turn on switching loss		E_{on}	–	5	–	mJ
Turn off switching loss		E_{off}	–	5.07	–	
Turn–on delay time	Tj = 125°C V_{CE} = 600 V, I_C = 75 A V_{GE} = –8 V to +15 V, R_G = 25 Ω	$t_{d(on)}$	–	229	–	ns
Rise time		t_r	–	77	–	
Turn–off delay time		$t_{d(off)}$	–	1401	–	
Fall time		t_f	–	264	–	
Turn on switching loss		E_{on}	–	7.31	–	mJ
Turn off switching loss		E_{off}	–	8.67	–	
Input capacitance	V_{CE} = 20 V, V_{GE} = 0 V, f = 10 kHz	C_{ies}	–	25509	–	pF
Output capacitance		C_{oes}	–	629	–	
Reverse transfer capacitance		C_{res}	–	141	–	
Gate charge total	V_{CE} = 600 V, I_C = 300 A, V_{GE} = 15 V	Q_g	–	720	–	nC
Thermal Resistance – chip–to–heatsink	Thermal grease, Thickness = 2.1 Mil ± 2%, λ = 2.9 W/mK	R_{thJH}	–	0.21	–	°C/W
IGBT INVERSE DIODE (D1, D4, D5, D6)						
Forward voltage (pin–to–pin)	IF = 150 A, Tj = 25°C IF = 150 A, Tj = 150°C	V_F	– –	2.03 1.76	2.44 –	V
Reverse recovery time	T_j = 25°C V_{CE} = 600 V, I_C = 75 A, V_{GE} = –8 V to +15 V, R_G = 15 Ω, $R_{G(off)}$ = 20 Ω	T_{rr}	–	54	–	ns
Reverse recovery charge		Q_{rr}	–	2.29	–	μC
Peak reverse recovery current		I_{rrm}	–	69	–	A
Reverse Peak rate of fall of re-covery current		di/dt	–	2134	–	A/μs
Reverse recovery energy		Err	–	0.47	–	mJ

2. Rated per T1/T4 IGBTs

Table 2. ELECTRICAL CHARACTERISTICS (T_J = 25°C unless otherwise specified)

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
IGBT INVERSE DIODE (D1, D4, D5, D6)						
Reverse recovery time	T_j = 125°C V_{CE} = 600 V, I_C = 75 A, V_{GE} = –8 V to +15 V, R_G = 15Ω, $R_{G(off)}$ = 20 Ω	T_{rr}	–	104	–	ns
Reverse recovery charge		Q_{rr}	–	4.39	–	μC
Peak reverse recovery current		I_{rrm}	–	81	–	A
Reverse Peak rate of fall of re-covery current		di/dt	–	1134	–	A/μs
Reverse recovery energy		Err	–	1.06	–	mJ
Thermal Resistance – chip–to–heatsink	Thermal grease, Thickness = 2.1 Mil ± 2%, λ = 2.9 W/mK	R_{thJH}	–	0.40	–	°C/W
IGBT INVERSE DIODE (D2, D3)						
Forward voltage (pin–to–pin)	IF = 60 A, Tj = 25°C IF = 60 A, Tj = 150°C	V_F	– –	1.52 2.02	1.85 –	V
Reverse recovery time	T_j = 25°C V_{CE} = 600 V, I_C = 75 A, V_{GE} = –8 V to +15 V, R_G = 15 Ω	T_{rr}	–	43	–	ns
Reverse recovery charge		Q_{rr}	–	0.27	–	μC
Peak reverse recovery current		I_{rrm}	–	10.31	–	A
Reverse Peak rate of fall of re-covery current		di/dt	–	864	–	A/μs
Reverse recovery energy		Err	–	0.05	–	mJ
Reverse recovery time	T_j = 125°C V_{CE} = 600 V, I_C = 75 A, V_{GE} = –8 V to +15 V, R_G = 15 Ω	T_{rr}	–	82	–	ns
Reverse recovery charge		Q_{rr}	–	1.36	–	μC
Peak reverse recovery current		I_{rrm}	–	30.57	–	A
Reverse Peak rate of fall of re-covery current		di/dt	–	460	–	A/μs
Reverse recovery energy		Err	–	0.35	–	mJ
Thermal Resistance – chip–to–heatsink	Thermal grease, Thickness = 2.1 Mil ± 2%, λ = 2.9 W/mK	R_{thJH}	–	0.55	–	°C/W
THERMISTOR CHARACTERISTICS						
Nominal resistance	T = 25°C	R_{25}	–	22	–	kΩ
Nominal resistance	T = 100°C	R_{100}	–	1468	–	Ω
Deviation of R25		DR/R	–5	–	5	%
Power dissipation		P_D	–	200	–	mW
Power dissipation constant			–	2	–	mW/°C
B–value	B(25/50), tol ±3%		–	–	3950	°C
B–value	B(25/100), tol ±3%		–	–	3998	°C
NTC reference			–	–	B	

2. Rated per T1/T4 IGBTs

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

Orderable Part Number	Marking	Package	Shipping
SNXH100M95H3Q2F2PG (GenIII – Q2PACK, Press–fit Pin)	SNXH100M95H3Q2F2PG	Q2PACK (Pb–Free)	12 Units / Blister Tray

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

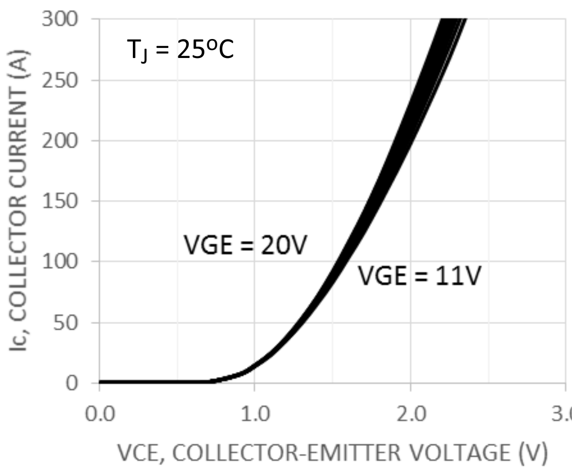


Figure 1. Typical Output Characteristics

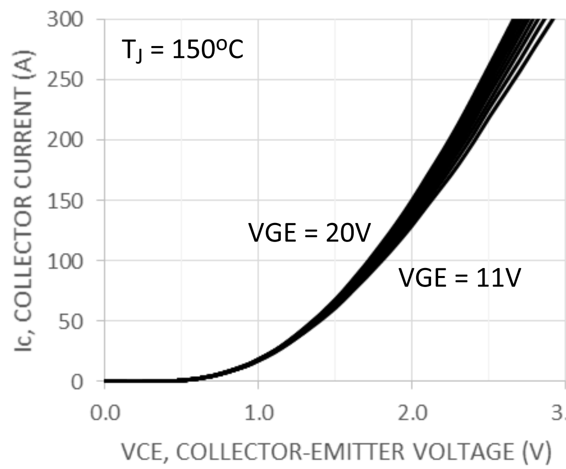


Figure 2. Typical Output Characteristics

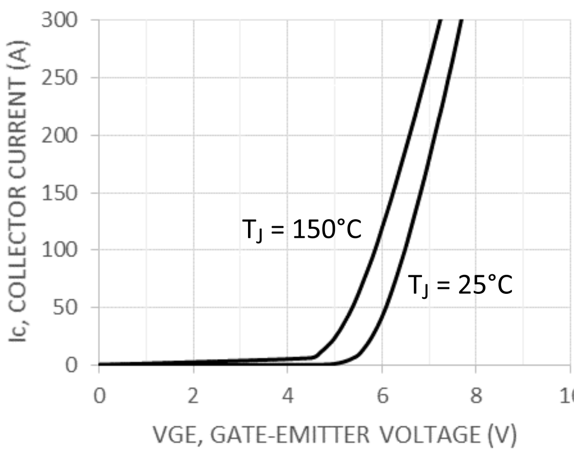


Figure 3. Typical Transfer Characteristics

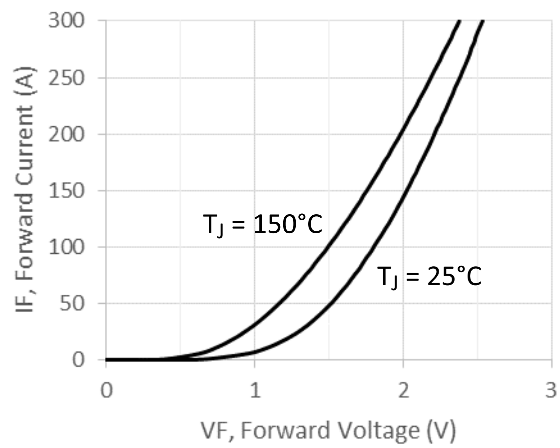


Figure 4. Diode Forward Characteristics

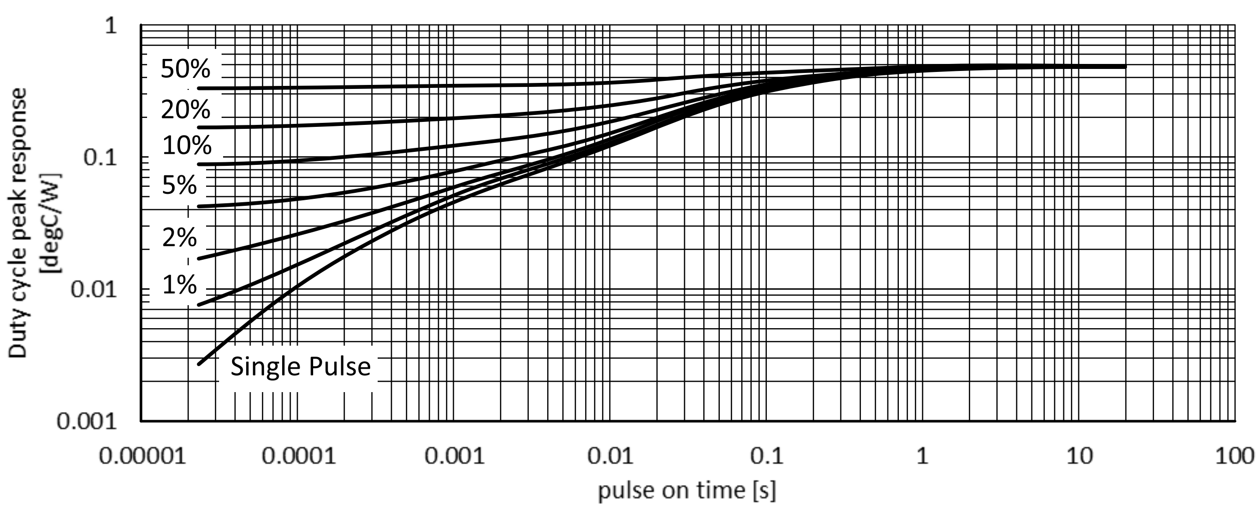


Figure 5. Transient Thermal Impedance (T1−1, T1−2, T4−1, T4−2)

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

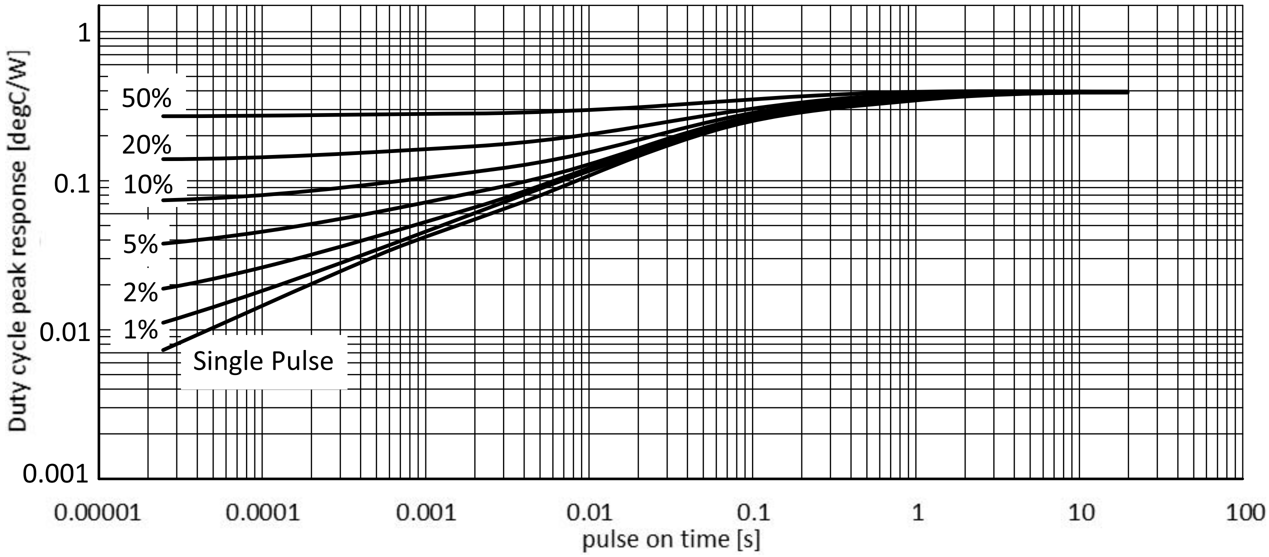


Figure 6. Transient Thermal Impedance (D1, D4)

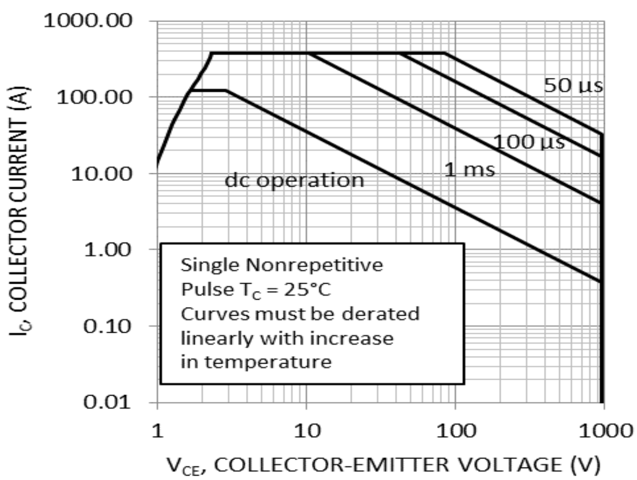


Figure 7. FBSOA (T1−1, T1−2, T4−1, T4−2)

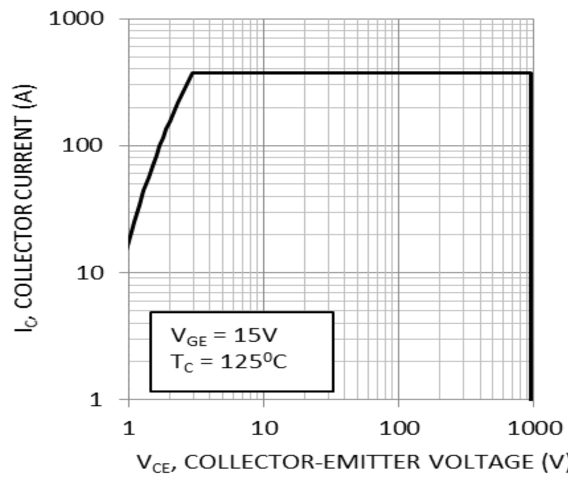


Figure 8. RBSOA (T1−1, T1−2, T4−1, T4−2)

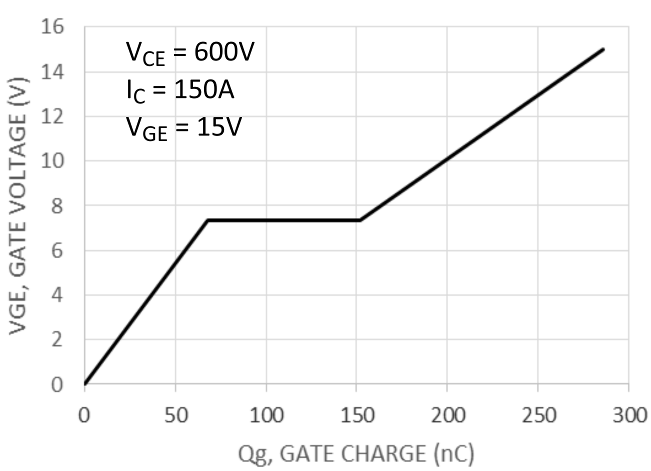


Figure 9. Gate Voltage vs. Gate Charge

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

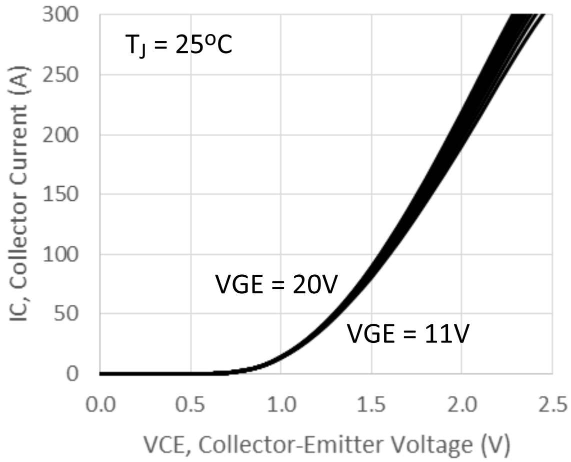


Figure 10. Typical Output Characteristics

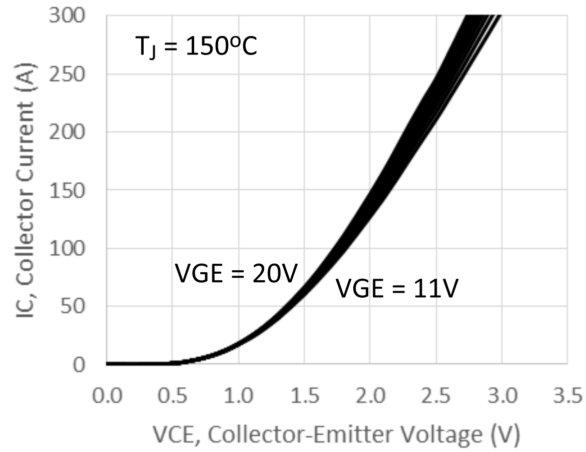


Figure 11. Typical Output Characteristics

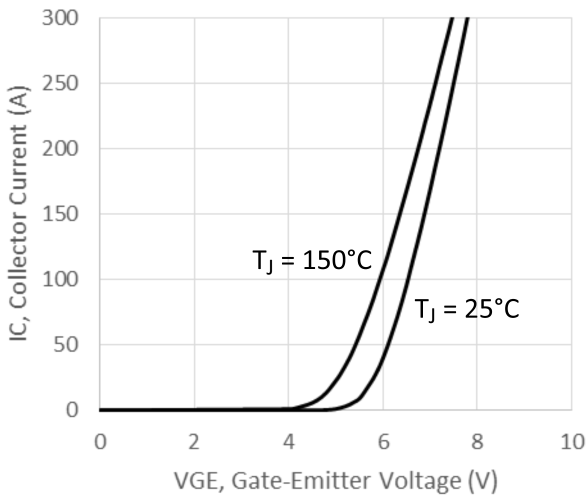


Figure 12. Typical Transfer Characteristics

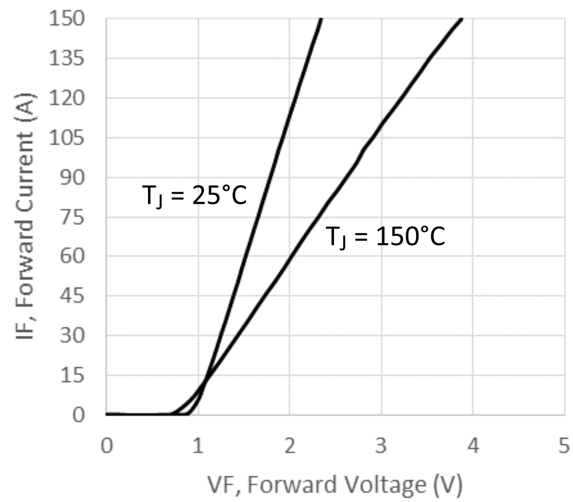


Figure 13. Diode Forward Characteristics

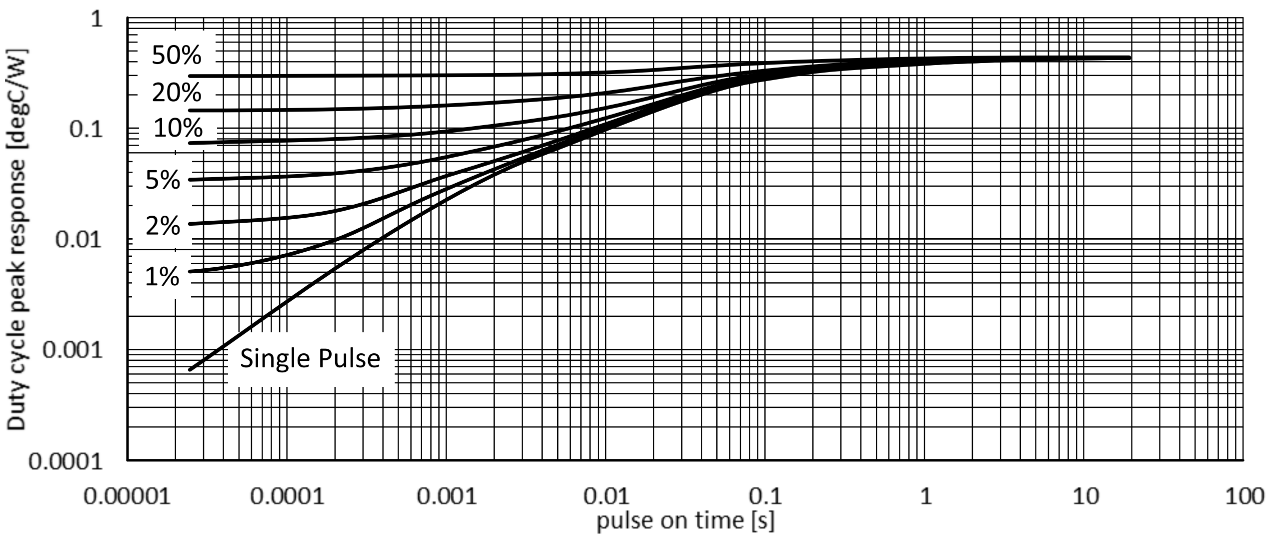


Figure 14. Transient Thermal Impedance (T2, T3)

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

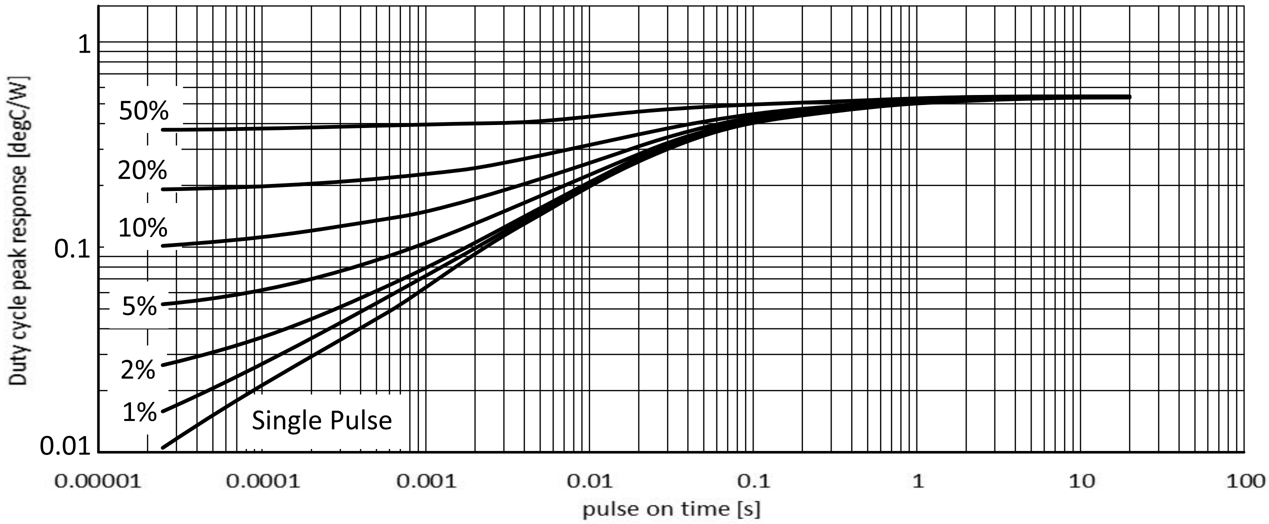


Figure 15. Transient Thermal Impedance (D2, D3)

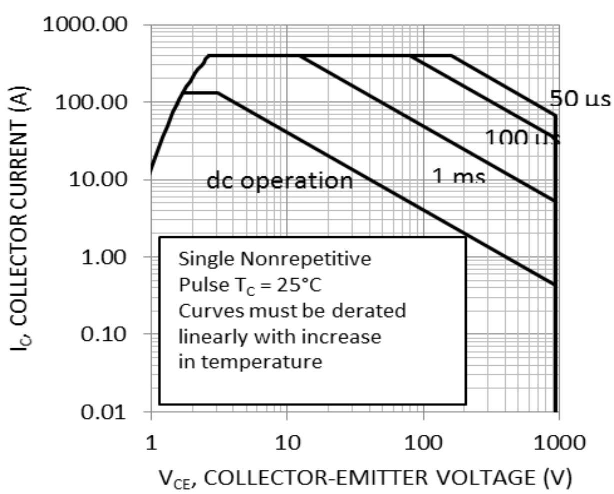


Figure 16. FBSOA (T2, T3)

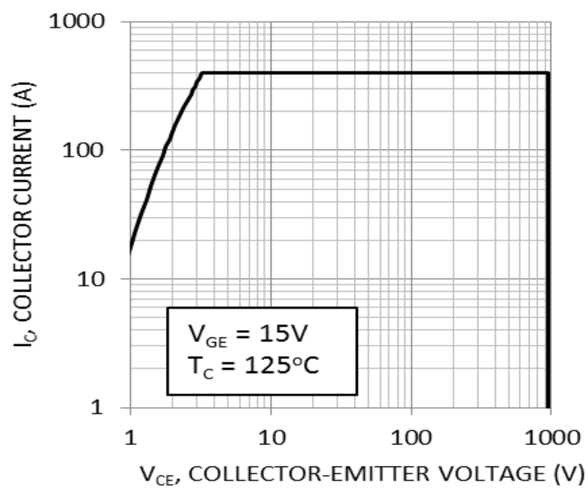


Figure 17. RBSOA (T2, T3)

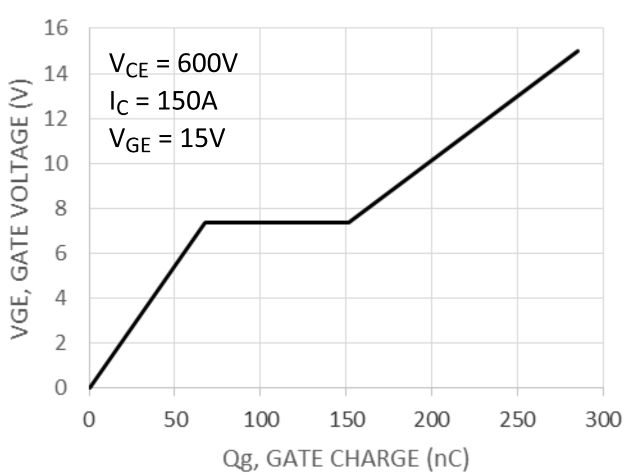


Figure 18. Gate Voltage vs. Gate Charge

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

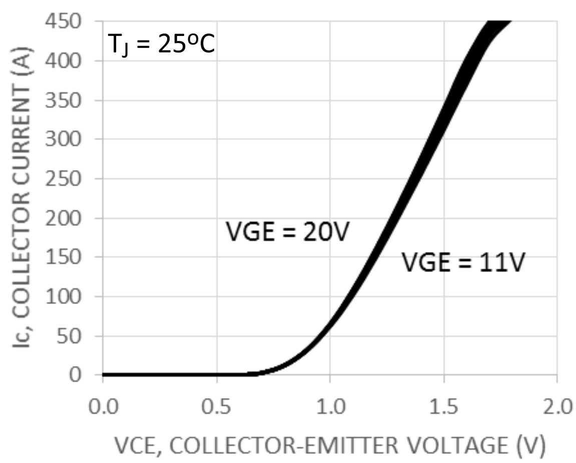


Figure 19. Typical Output Characteristics

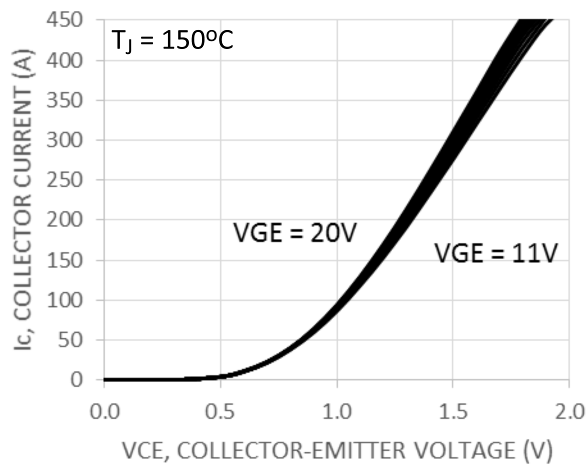


Figure 20. Typical Output Characteristics

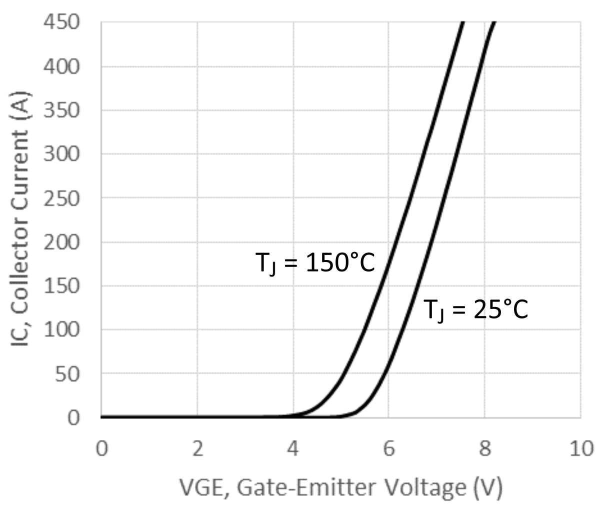


Figure 21. Typical Transfer Characteristics

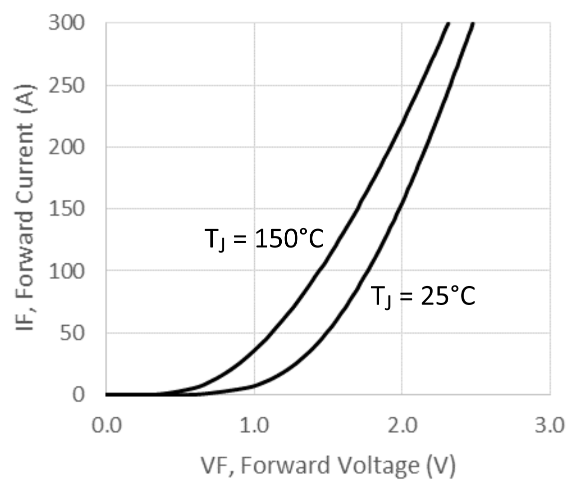


Figure 22. Diode Forward Characteristics

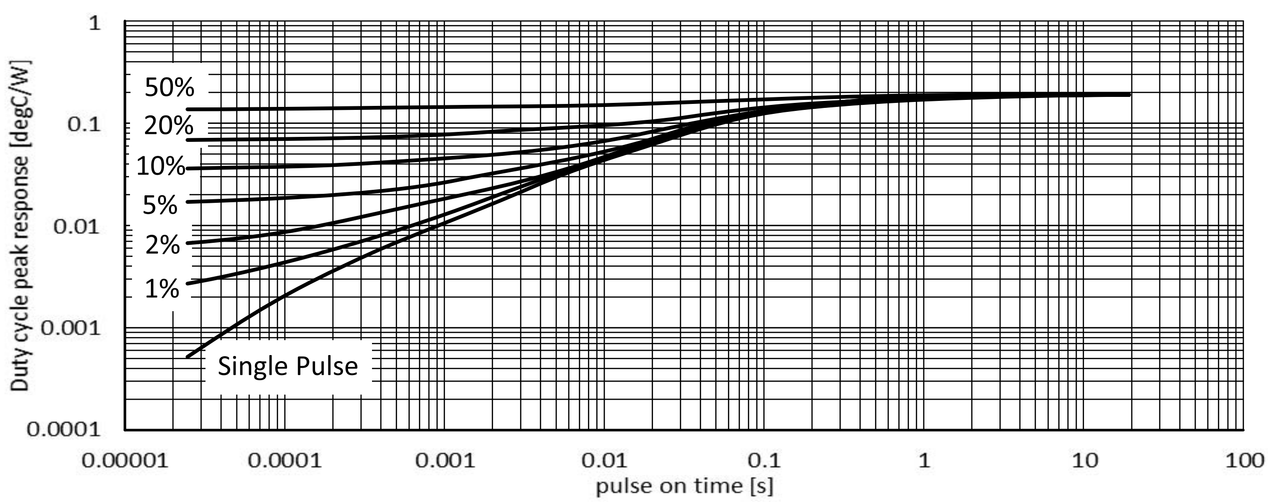


Figure 23. Transient Thermal Impedance (T5, T6)

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

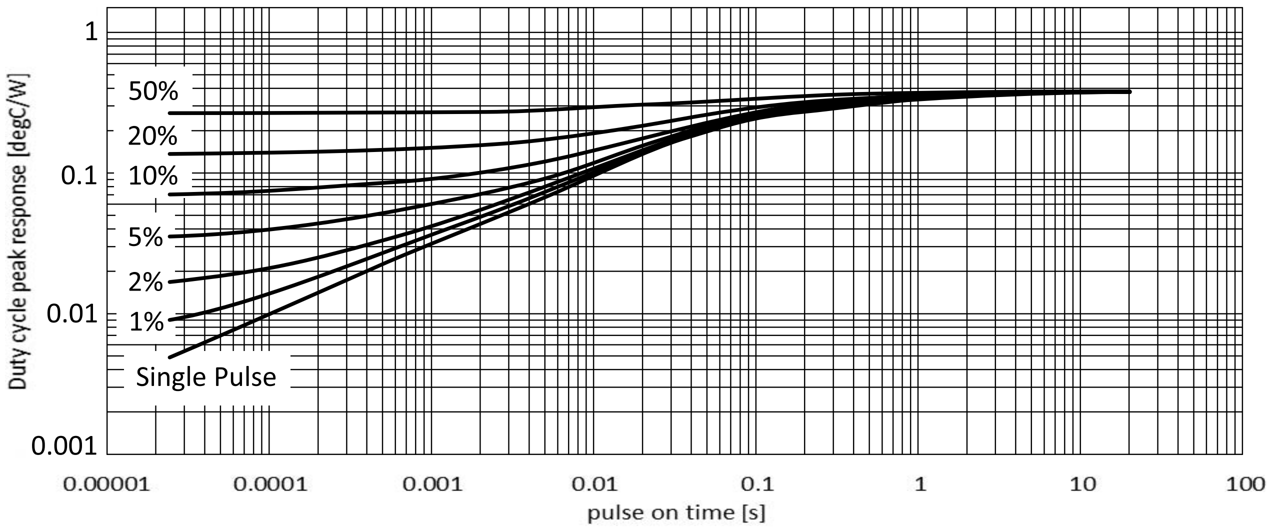


Figure 24. Transient Thermal Impedance (D5, D6)

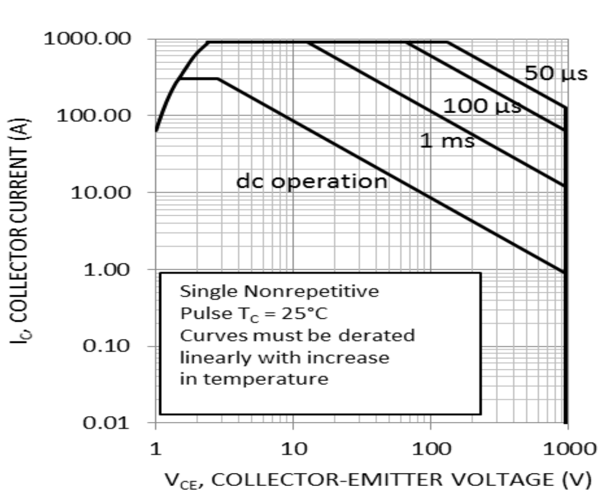


Figure 25. FBSOA (T2, T3)

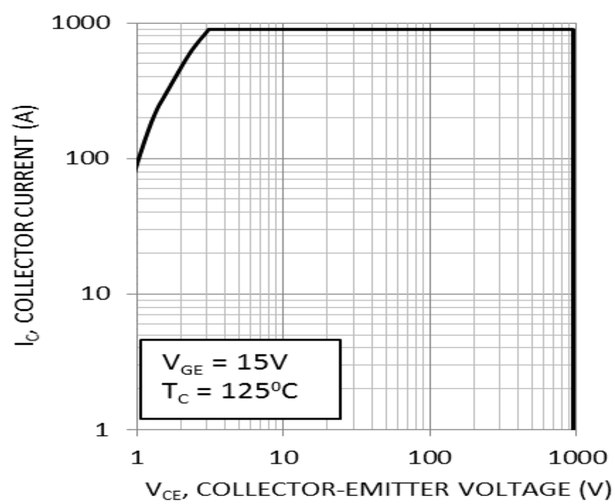


Figure 26. RBSOA (T2, T3)

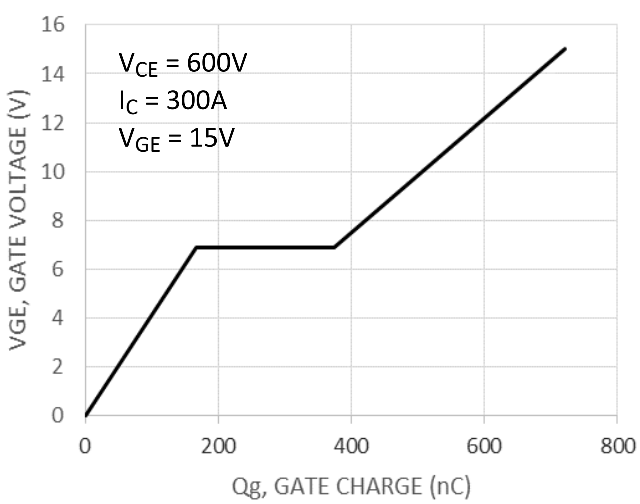


Figure 27. Gate Voltage vs. Gate Charge

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

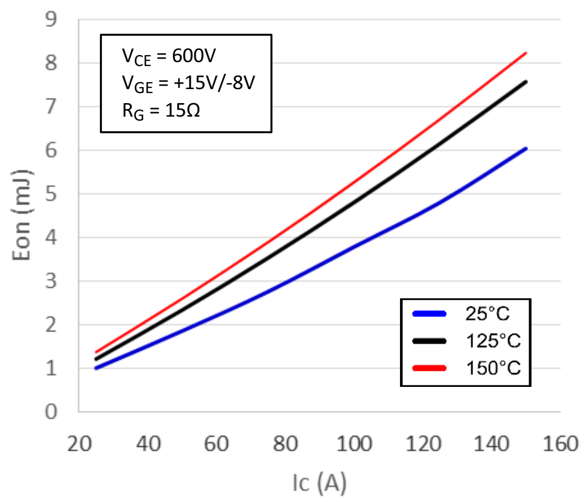


Figure 28. Typical Switching Loss Eon vs. IC

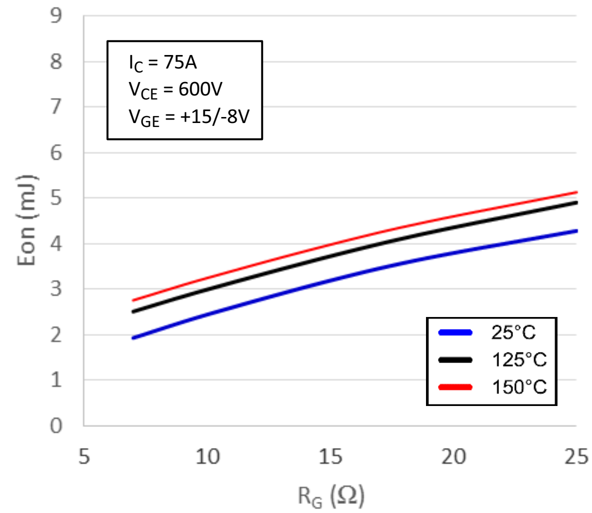


Figure 29. Typical Switching Loss Eon vs. R_G

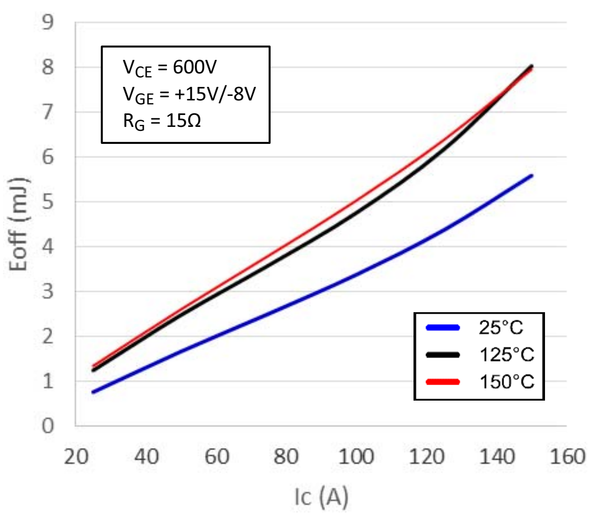


Figure 30. Typical Switching Loss Eoff vs. IC

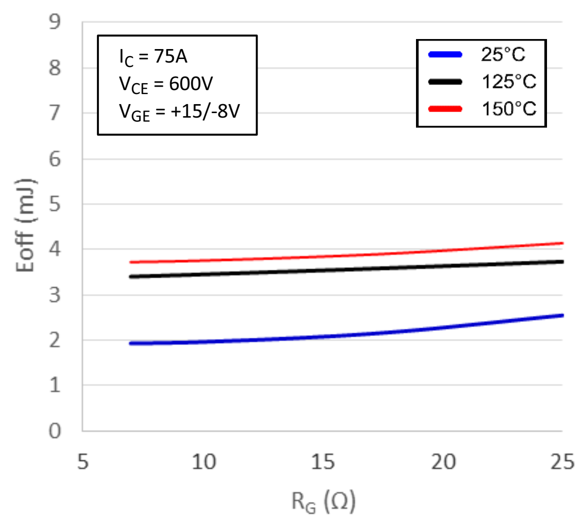


Figure 31. Typical Switching Loss Eoff vs. R_G

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

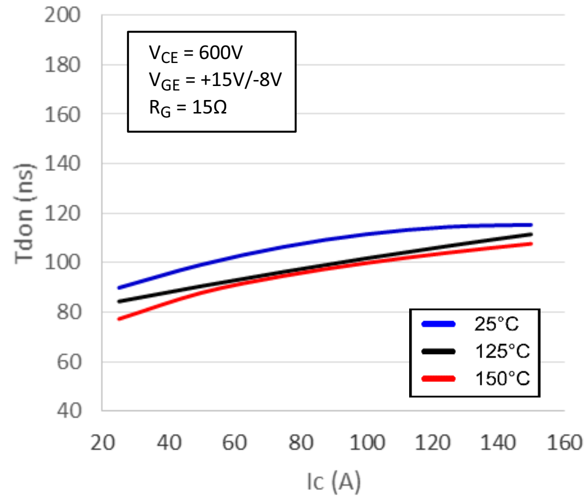


Figure 32. Typical Switching Time Tdon vs. IC

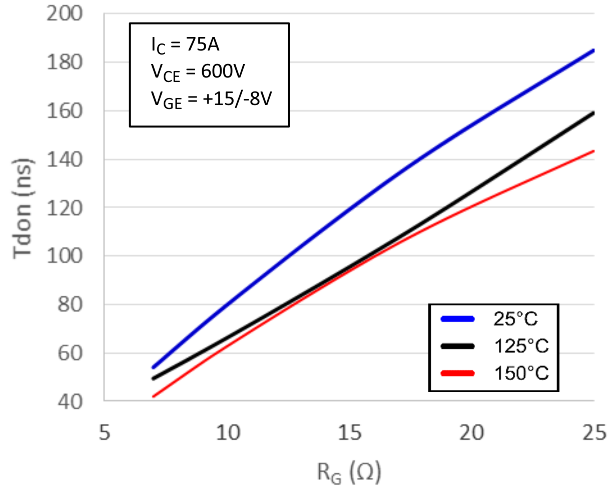


Figure 33. Typical Switching Time Tdon vs. R_G

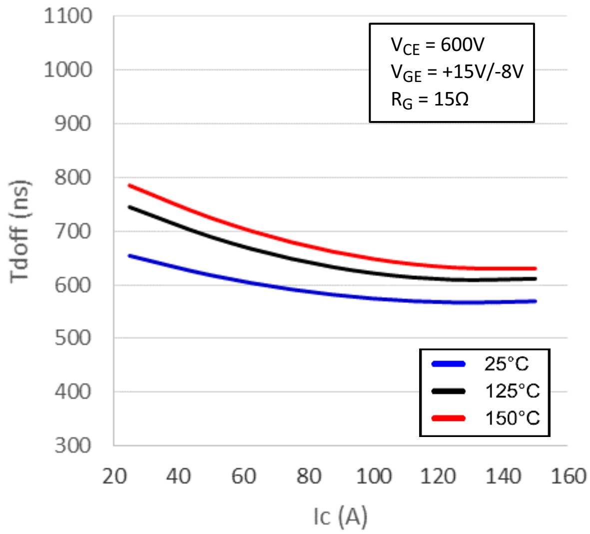


Figure 34. Typical Switching Time Tdoff vs. IC

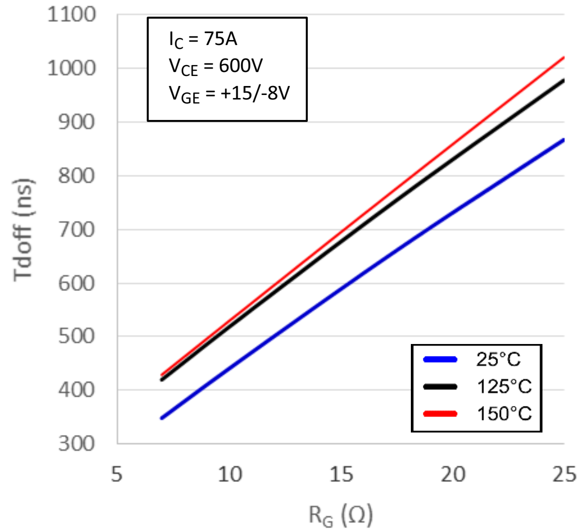


Figure 35. Typical Switching Time Tdoff vs. R_G

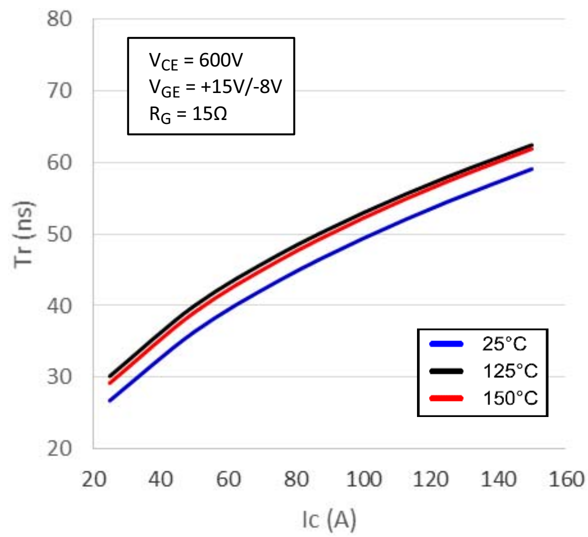


Figure 36. Typical Switching Time Tron vs. IC

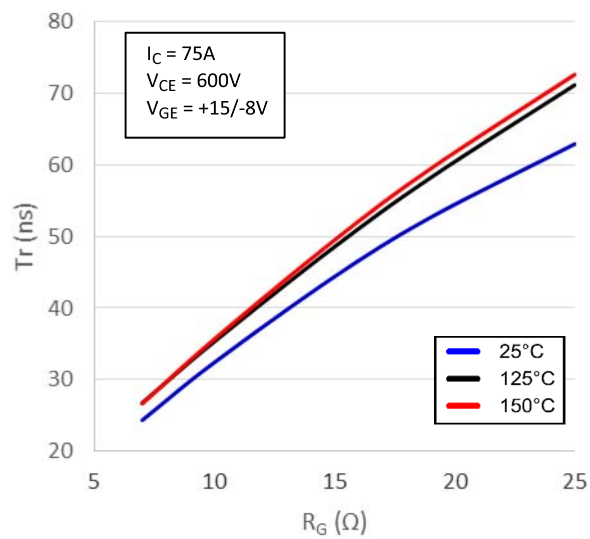


Figure 37. Typical Switching Time Tron vs. R_G

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

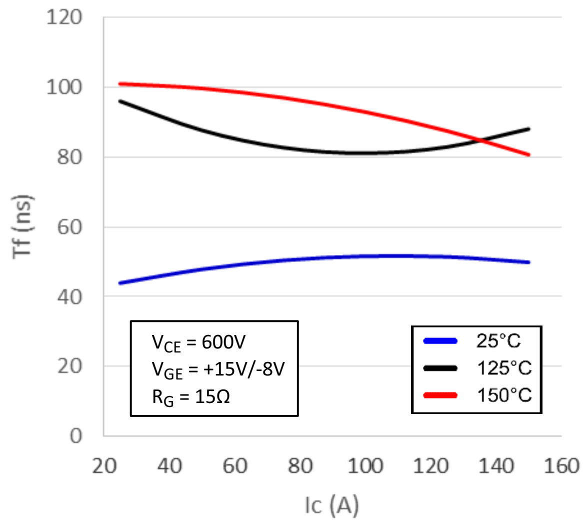


Figure 38. Typical Switching Time Tf vs. IC

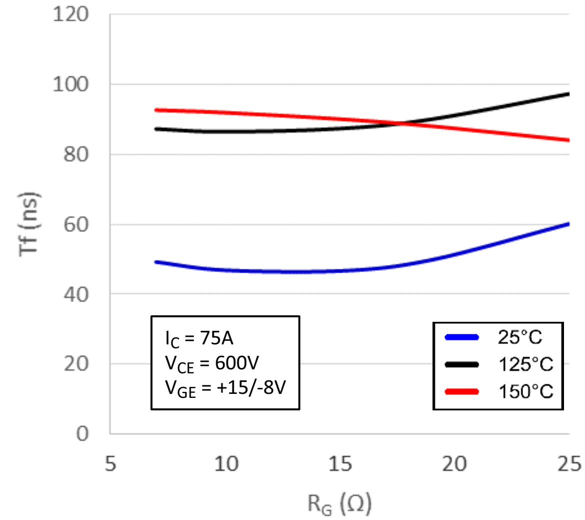


Figure 39. Typical Switching Time Tf vs. R_G

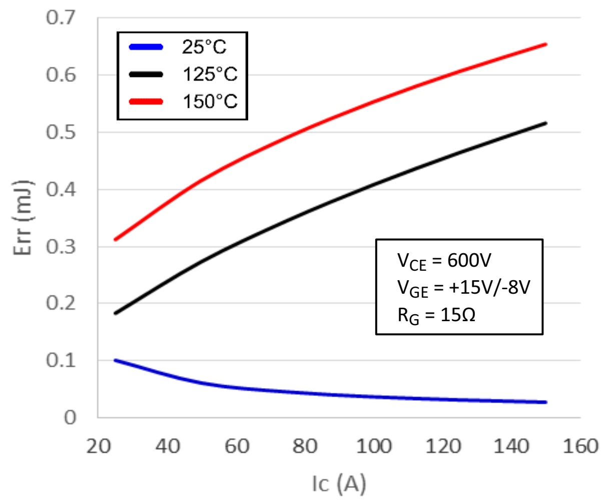


Figure 40. Typical Reverse Recovery Energy vs. IC

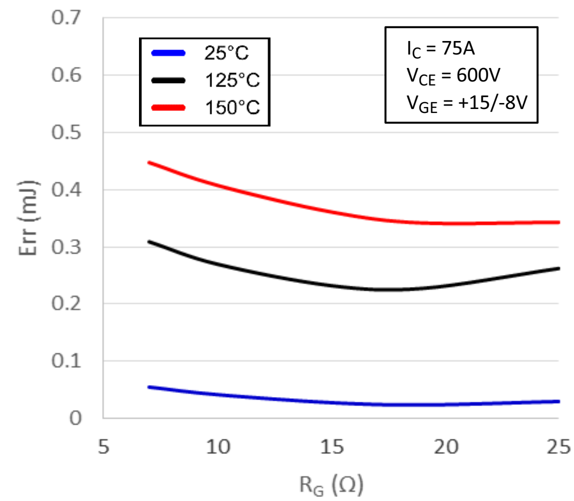


Figure 41. Typical Reverse Recovery Energy vs. R_G

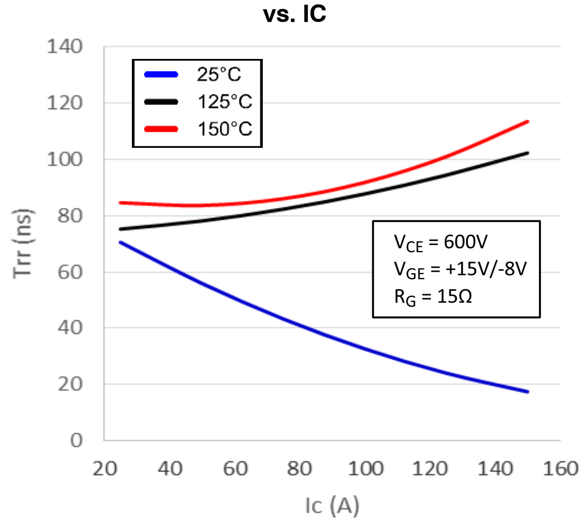


Figure 42. Typical Reverse Recovery Time vs. IC

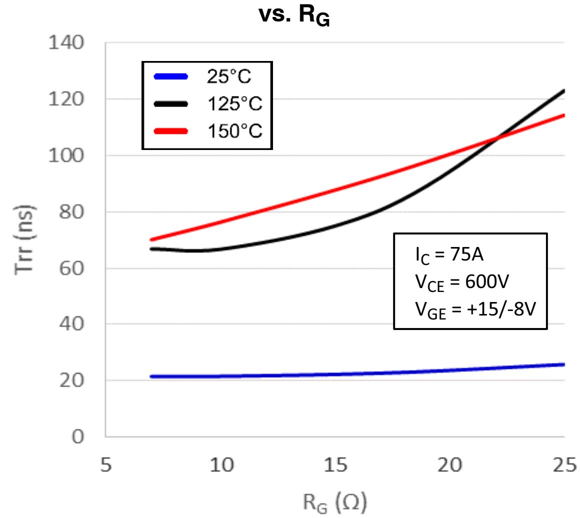


Figure 43. Typical Reverse Recovery Time vs. R_G

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

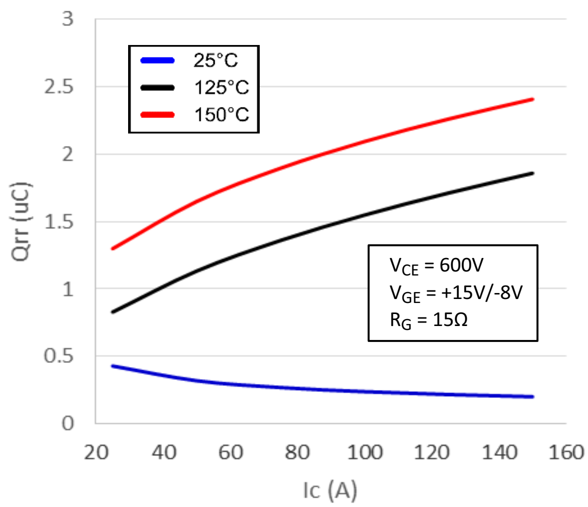


Figure 44. Typical Reverse Recovery Charge vs. IC

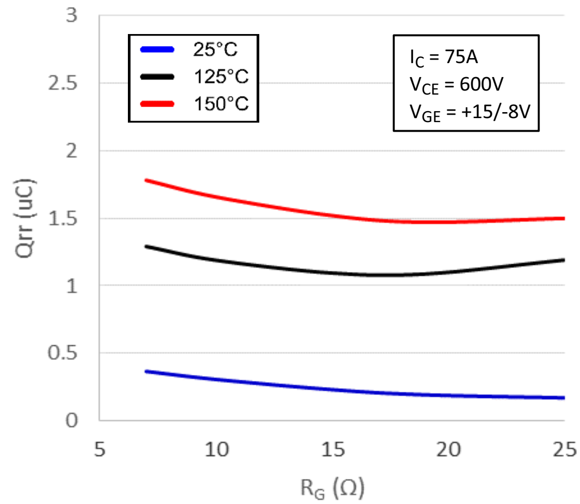


Figure 45. Typical Reverse Recovery Charge vs. R_G

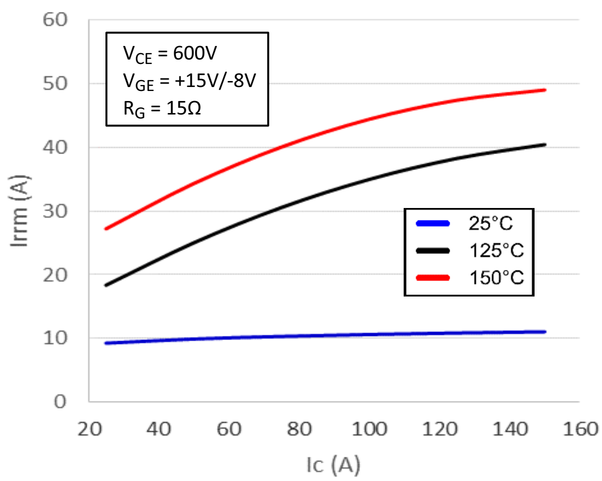


Figure 46. Typical Reverse Recovery Current vs. IC

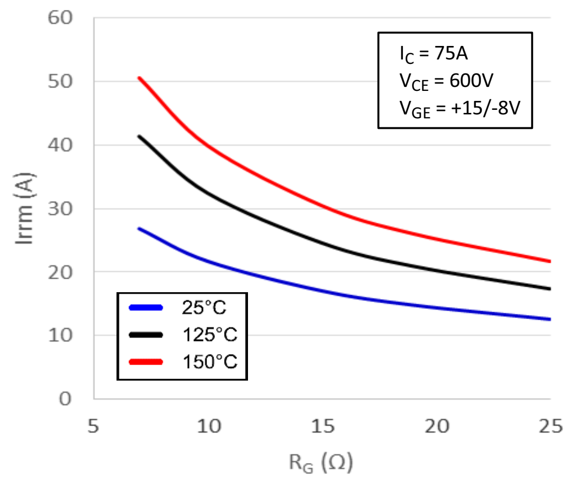


Figure 47. Typical Reverse Recovery Current vs. R_G

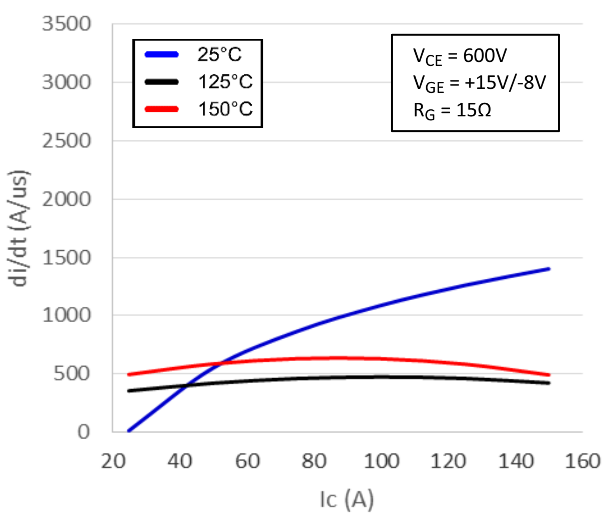


Figure 48. Typical di/dt vs. IC

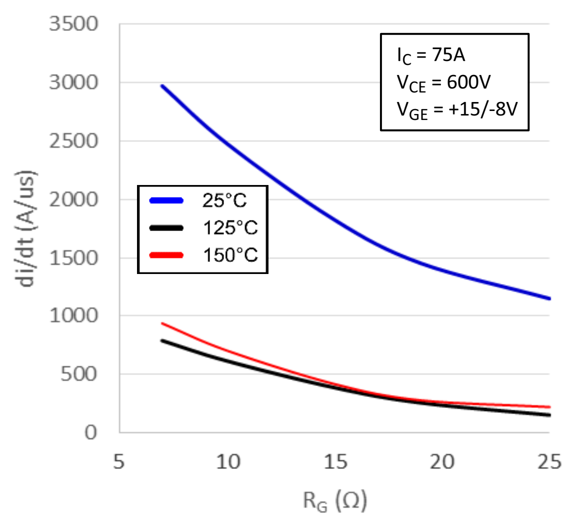


Figure 49. Typical di/dt vs. R_G

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

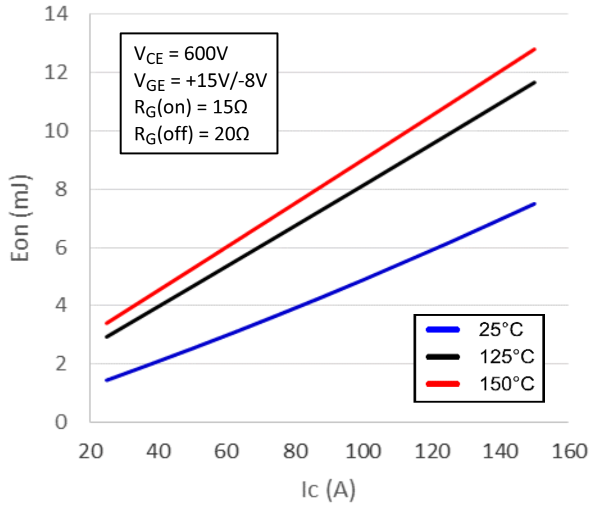


Figure 50. Typical Switching Energy Eon vs. IC

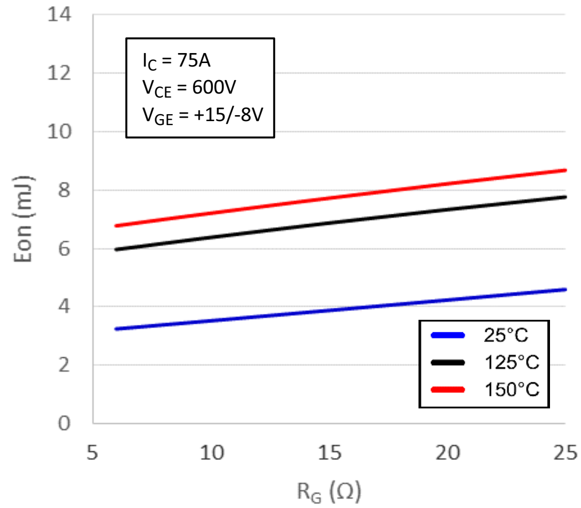


Figure 51. Typical Switching Energy Eon vs. R_G

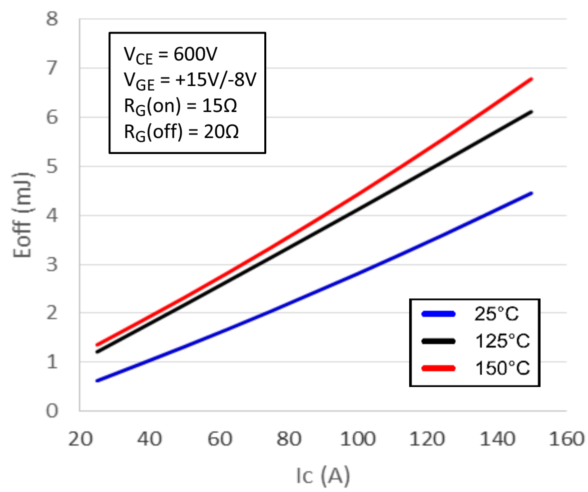


Figure 52. Typical Switching Energy Eoff vs. IC

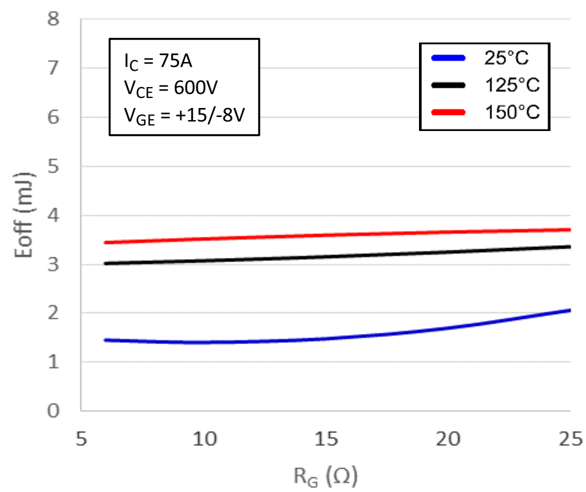


Figure 53. Typical Switching Energy Eoff vs. R_G

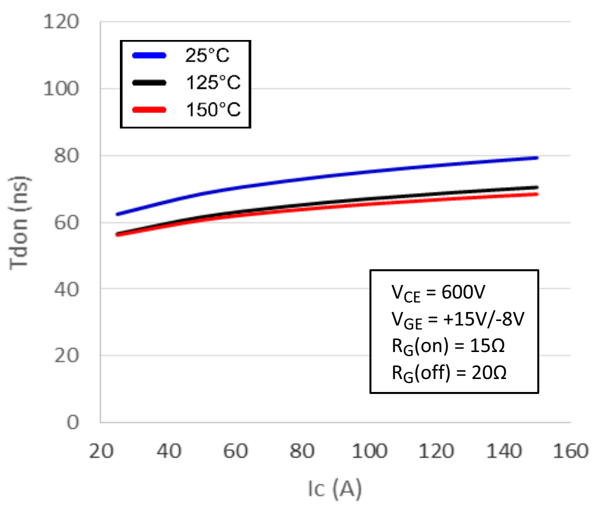


Figure 54. Typical Switching Time Tdon vs. IC

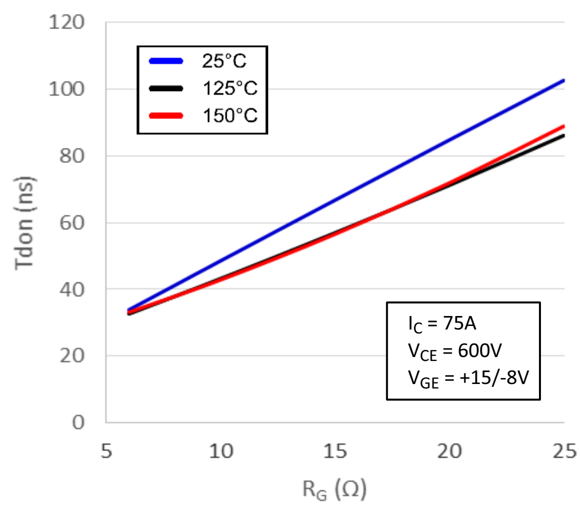


Figure 55. Typical Switching Time Tdon vs. R_G

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

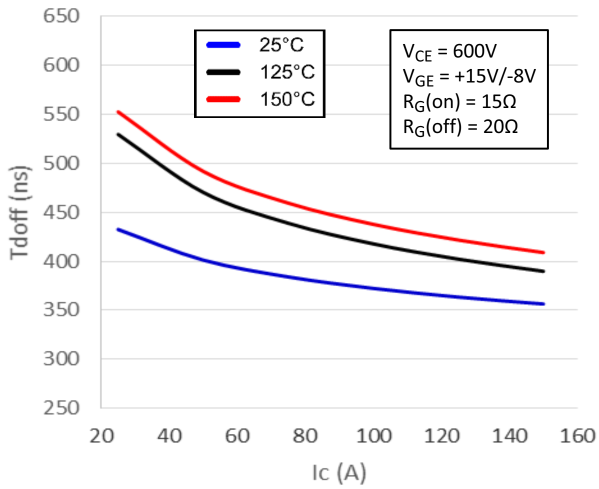


Figure 56. Typical Switching Time Tdoff vs. IC

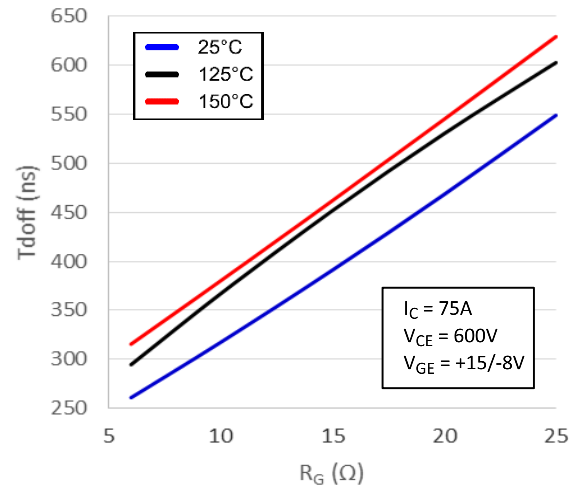


Figure 57. Typical Switching Time Tdoff vs. R_G

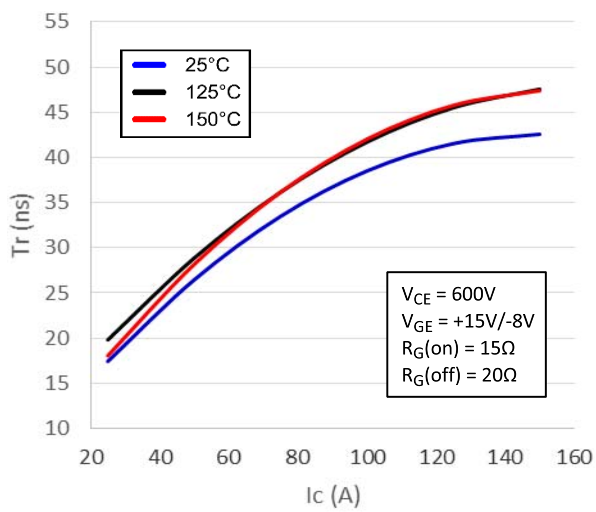


Figure 58. Typical Switching Time Tr vs. IC

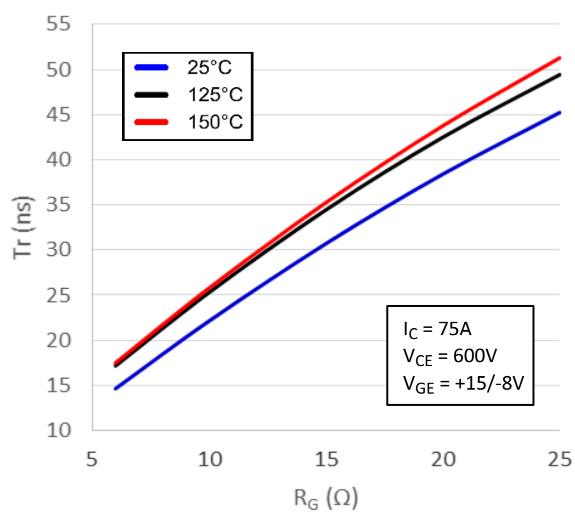


Figure 59. Typical Switching Time Tr vs. R_G

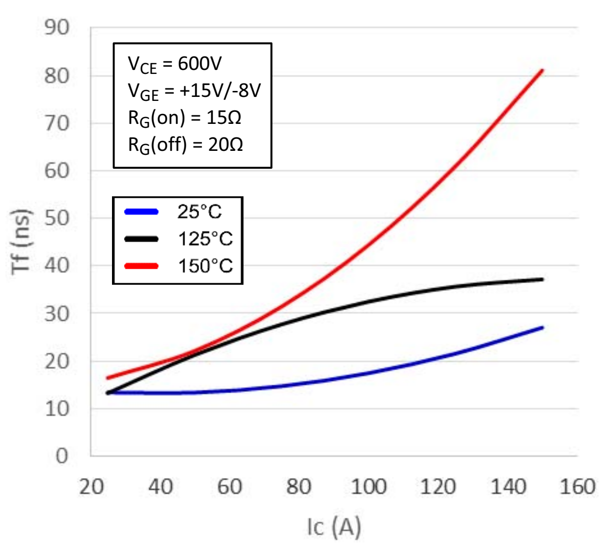


Figure 60. Typical Switching Time Tf vs. IC

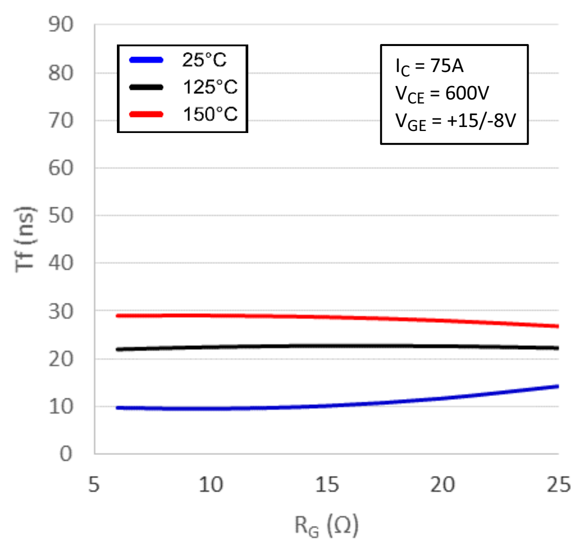


Figure 61. Typical Switching Time Tf vs. R_G

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

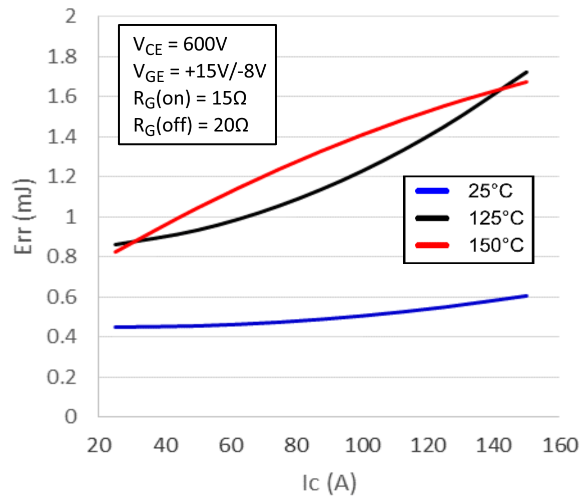


Figure 62. Typical Reverse Recovery Energy Loss vs. IC

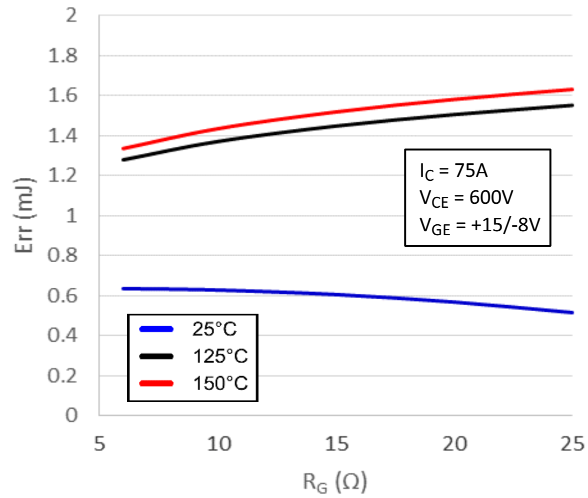


Figure 63. Typical Reverse Recovery Energy Loss vs. R_G

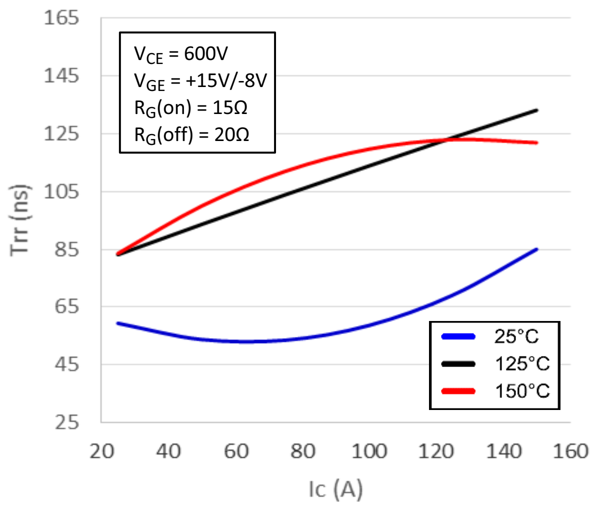


Figure 64. Typical Reverse Recovery Time vs. IC

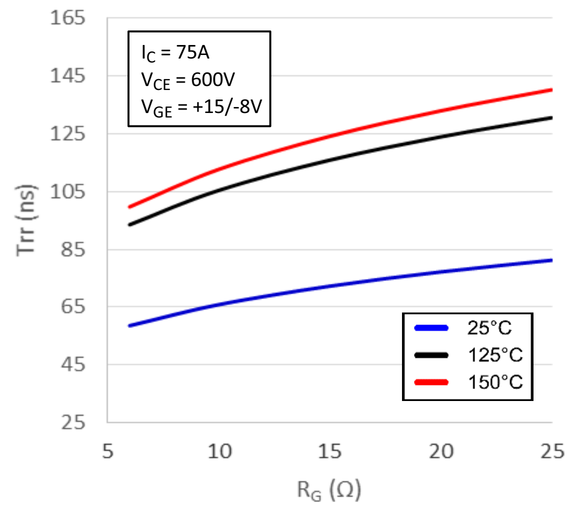


Figure 65. Typical Reverse Recovery Time vs. R_G

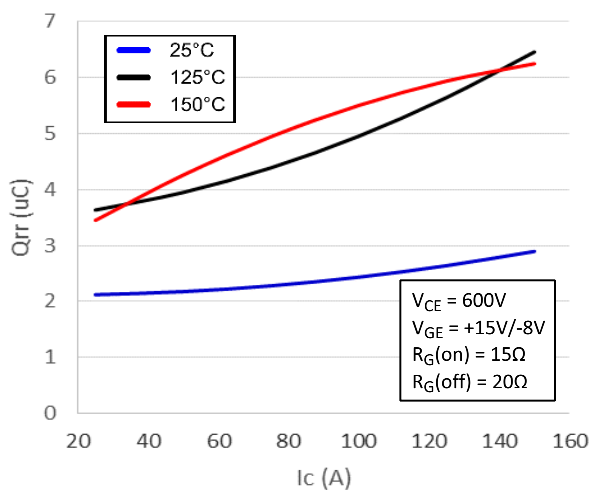


Figure 66. Typical Reverse Recovery Charge vs. IC

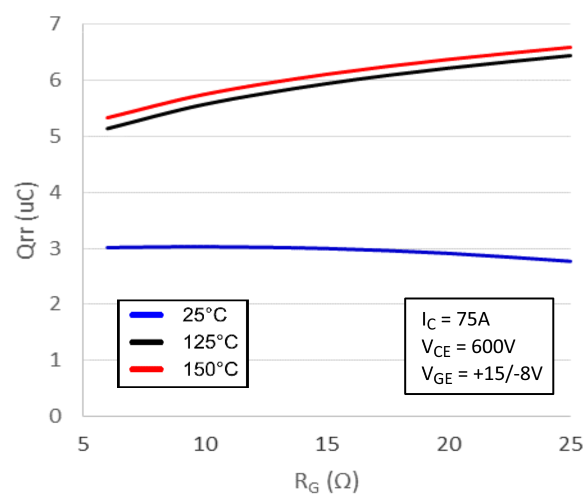


Figure 67. Typical Reverse Recovery Charge vs. R_G

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

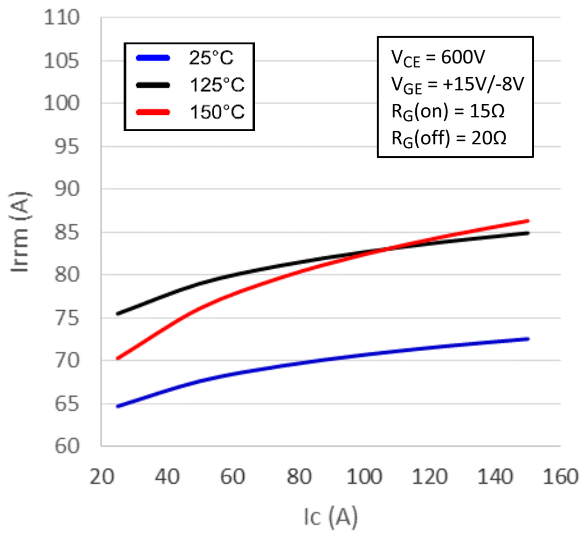


Figure 68. Typical Reverse Recovery Current vs. IC

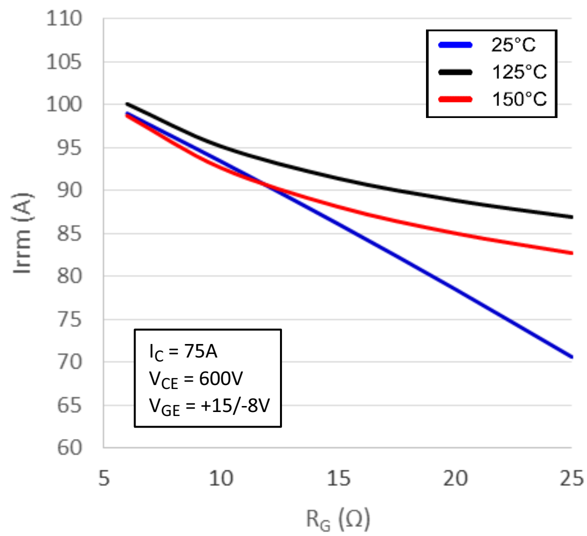


Figure 69. Typical Reverse Recovery Current vs. R_G

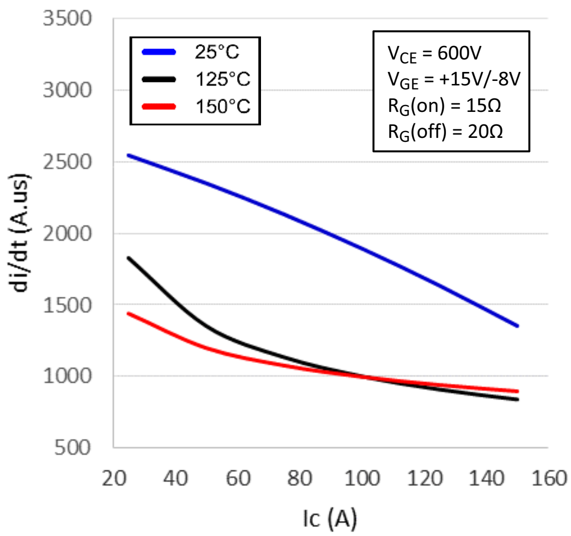


Figure 70. Typical di/dt vs. IC

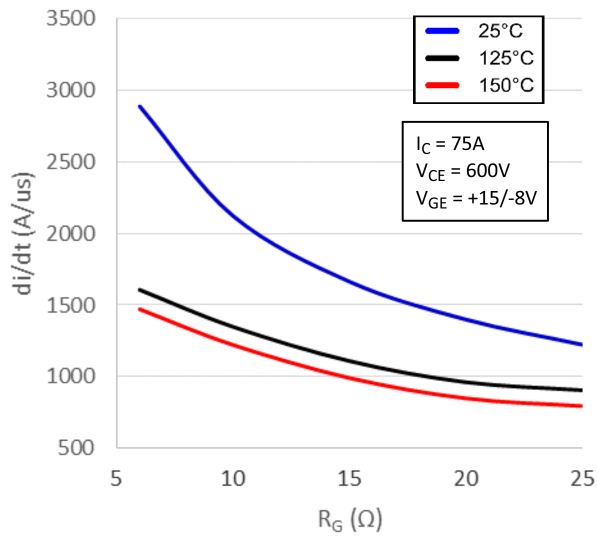


Figure 71. Typical di/dt vs. R_G

TYPICAL CHARACTERISTICS – T5/T6 IGBT COMUTATES D6D4/D5D1 DIODE

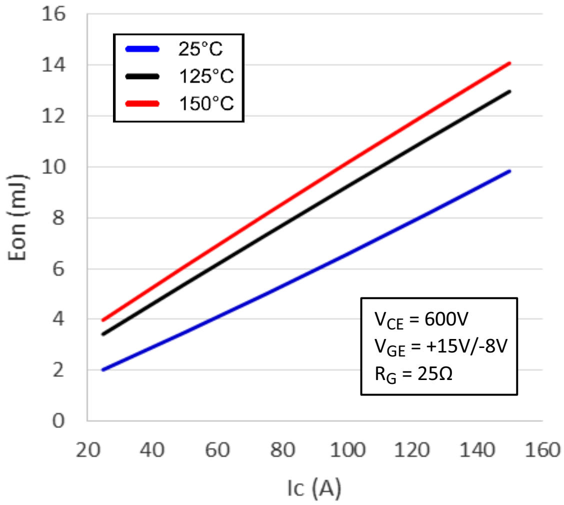


Figure 72. Typical Switching Energy Eon vs. IC

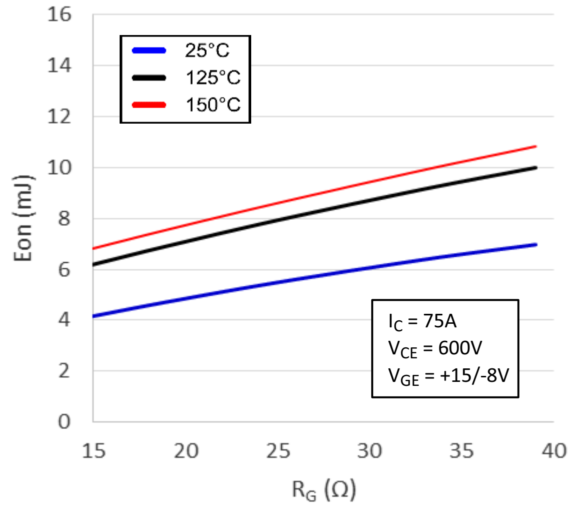


Figure 73. Typical Switching Energy Eon vs. R_G

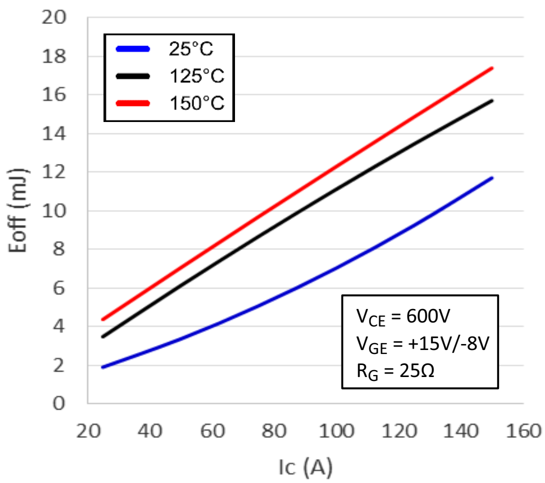


Figure 74. Typical Switching Energy Eoff vs. IC

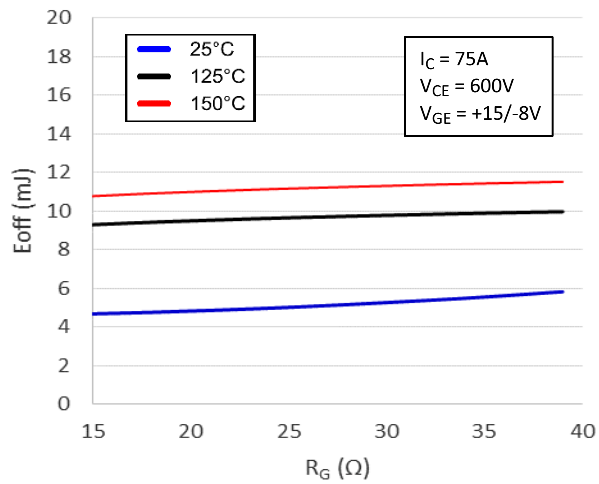


Figure 75. Typical Switching Energy Eoff vs. R_G

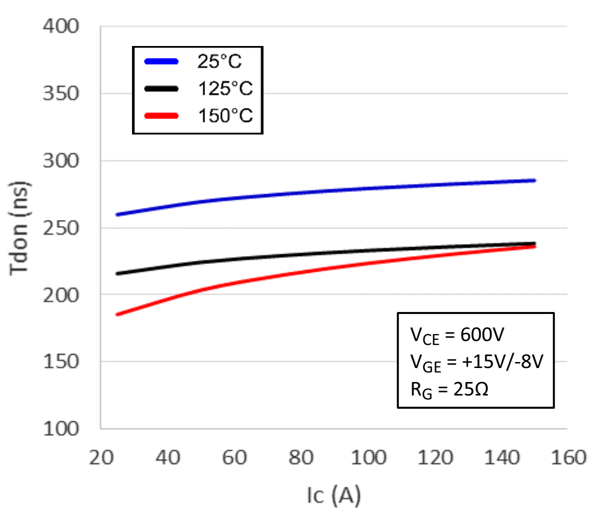


Figure 76. Typical Switching Time Tdon vs. IC

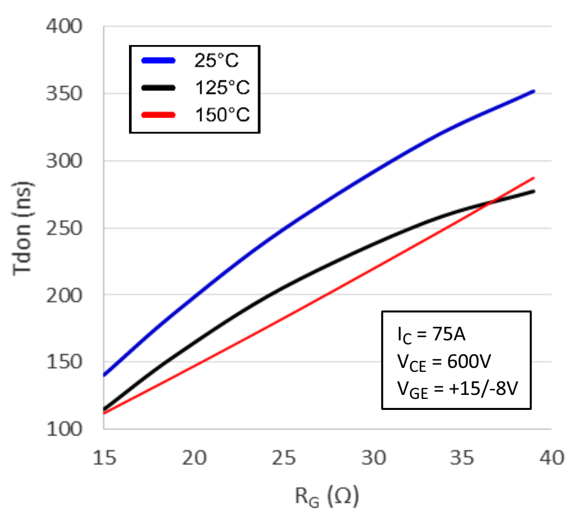


Figure 77. Typical Switching Time Tdon vs. R_G

TYPICAL CHARACTERISTICS – T5/T6 IGBT COMUTATES D6D4/D5D1 DIODE

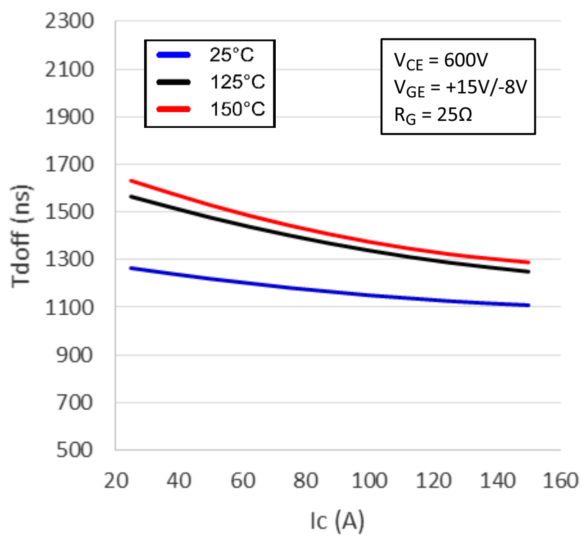


Figure 78. Typical Switching Time Tdoff vs. IC

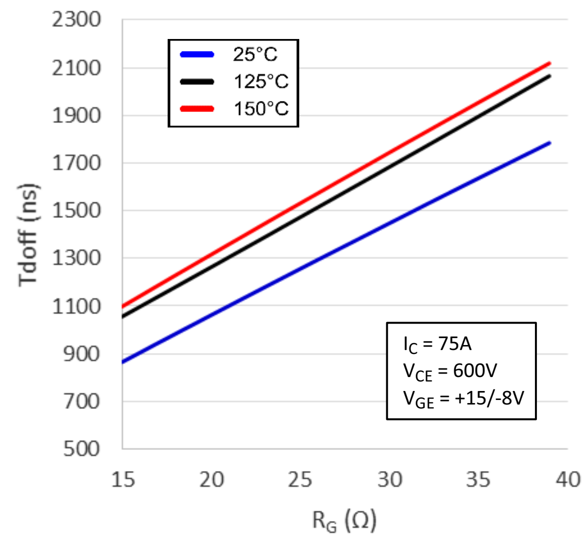


Figure 79. Typical Switching Time Tdoff vs. R_G

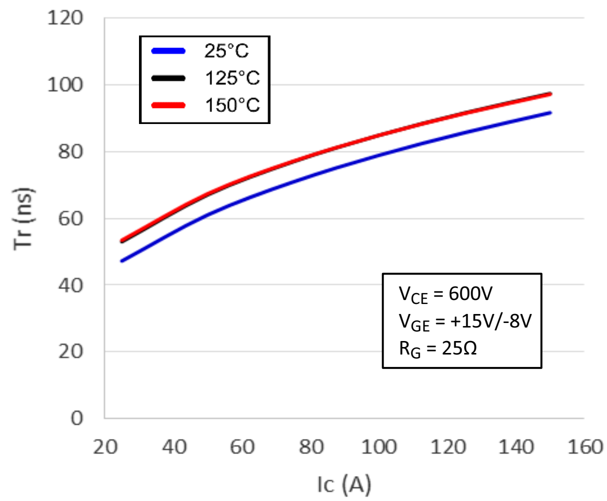


Figure 80. Typical Switching Time Tr vs. IC

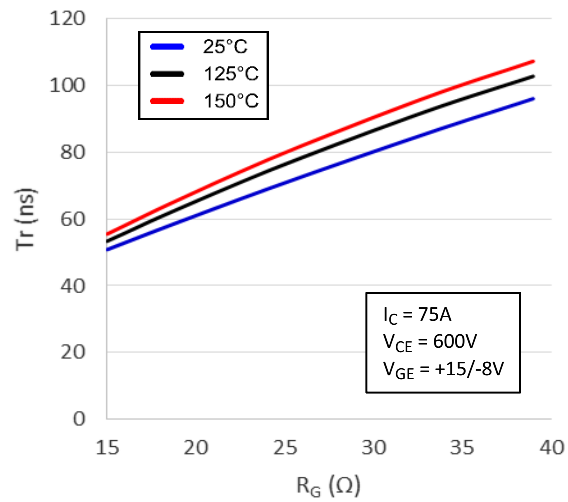


Figure 81. Typical Switching Time Tr vs. R_G

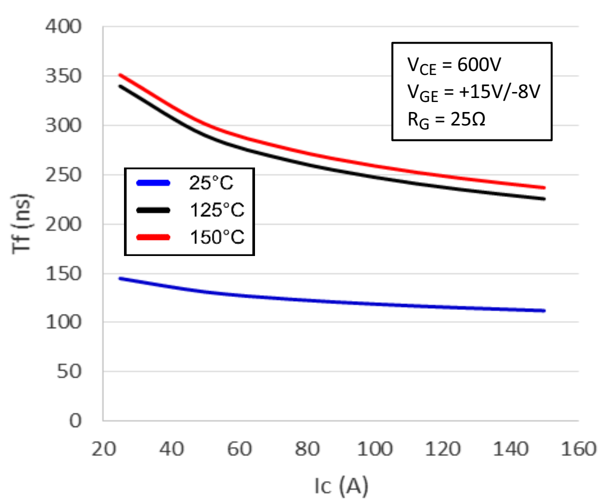


Figure 82. Typical Switching Time Tf vs. IC

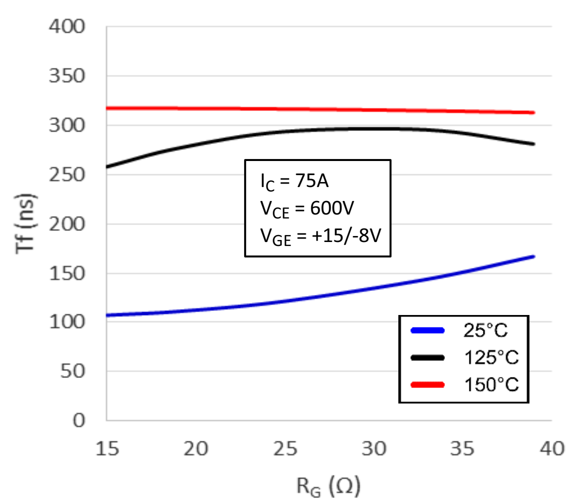


Figure 83. Typical Switching Time Tf vs. R_G

TYPICAL CHARACTERISTICS – T5/T6 IGBT COMUTATES D6D4/D5D1 DIODE

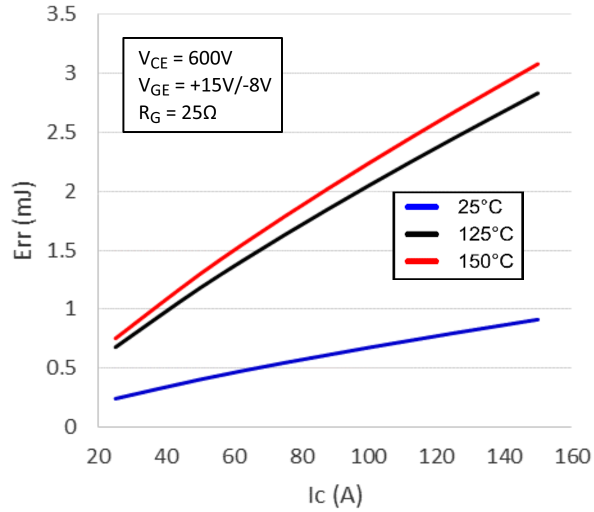


Figure 84. Typical Reverse Recovery Energy vs. IC

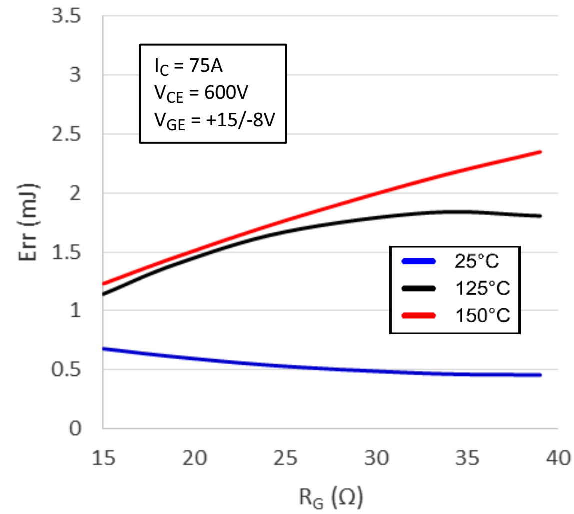


Figure 85. Typical Reverse Recovery Energy vs. R_G

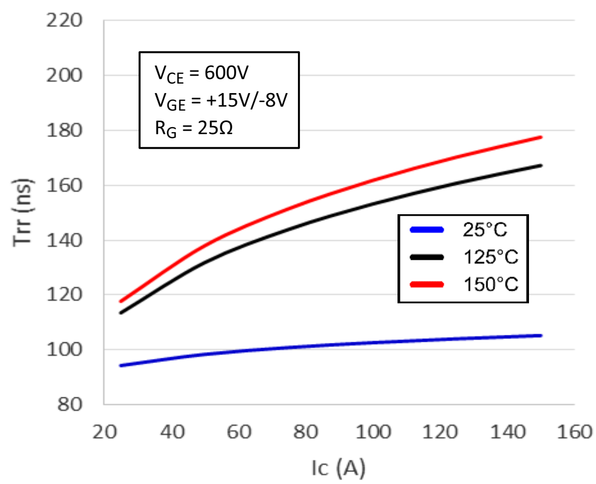


Figure 86. Typical Reverse Recovery Time vs. IC

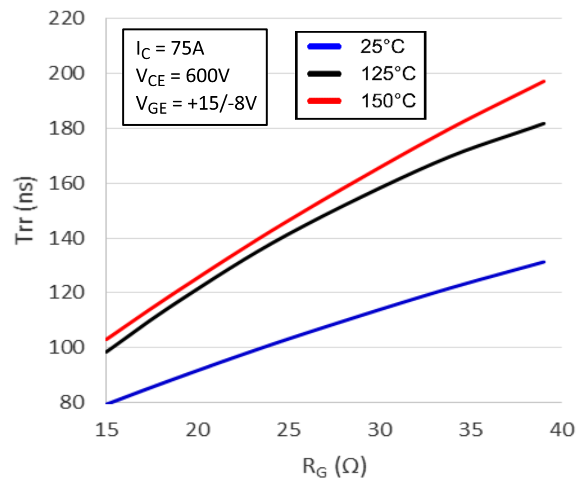


Figure 87. Typical Reverse Recovery Time vs. R_G

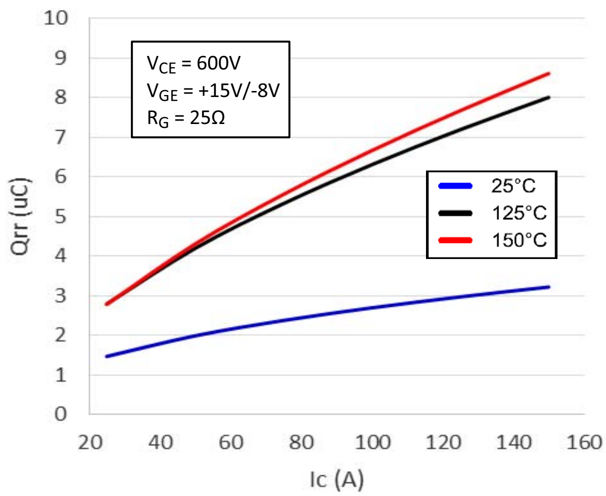


Figure 88. Typical Reverse Recovery Charge vs. IC

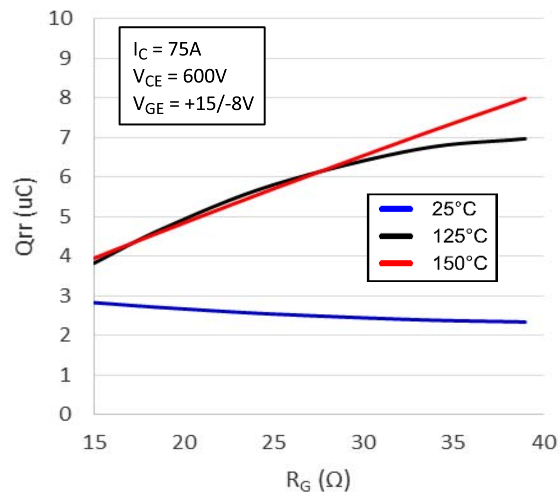


Figure 89. Typical Reverse Recovery Charge vs. R_G

TYPICAL CHARACTERISTICS – T5/T6 IGBT COMUTATES D6D4/D5D1 DIODE

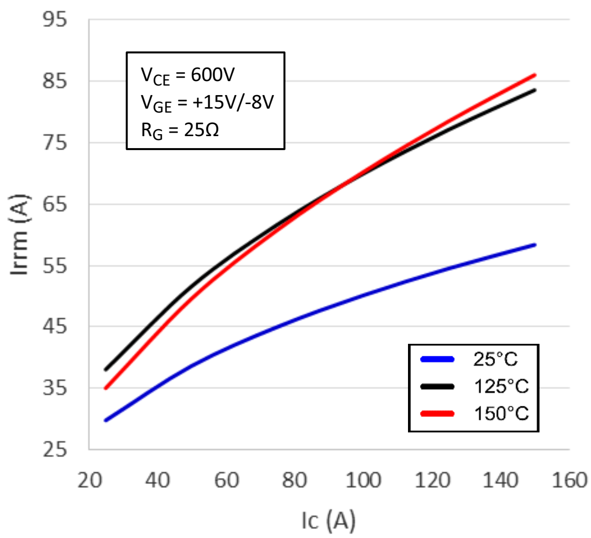


Figure 90. Typical Reverse Recovery Current vs. IC

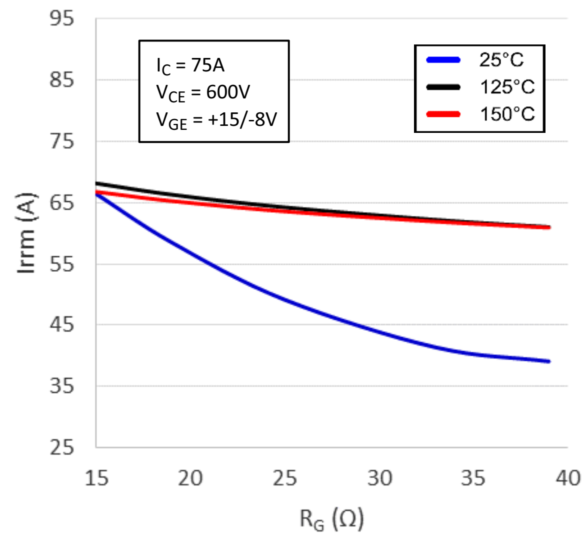


Figure 91. Typical Reverse Recovery Current vs. R_G

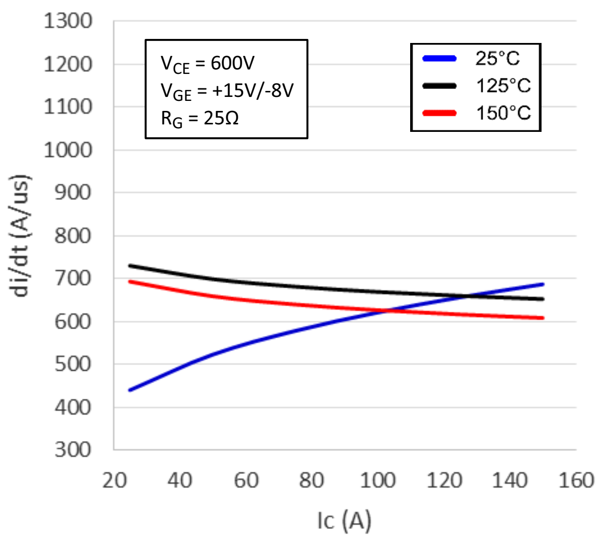


Figure 92. Typical di/dt vs. IC

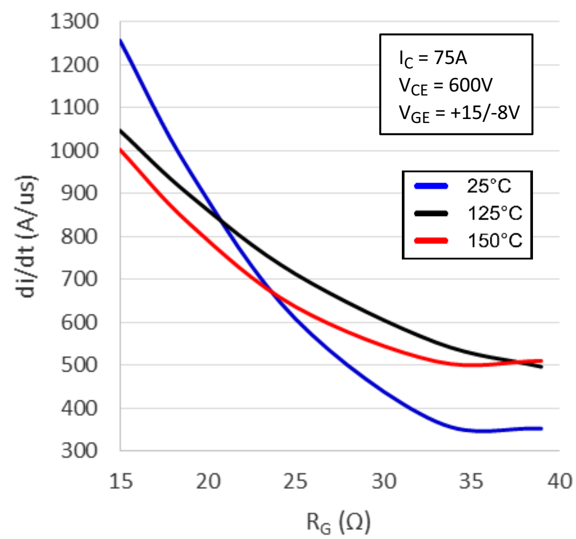
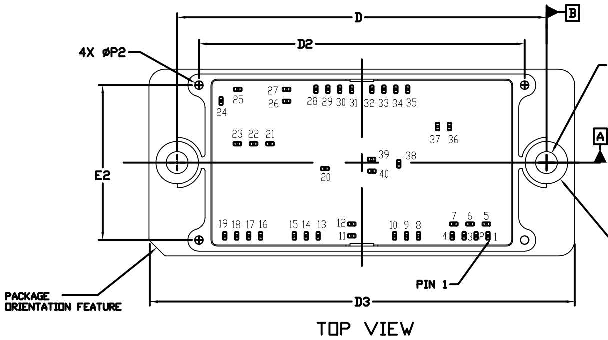
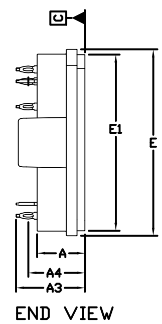


Figure 93. Typical di/dt vs. R_G

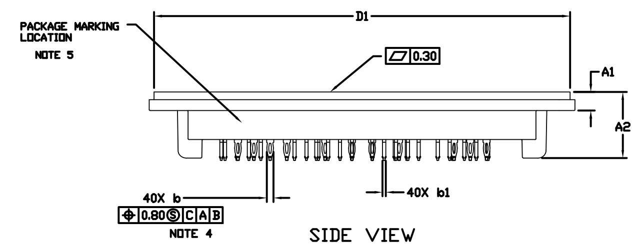
PACKAGE DIMENSIONS

PIM40, 93x47 (PRESS FIT)
CASE 180AM
ISSUE C





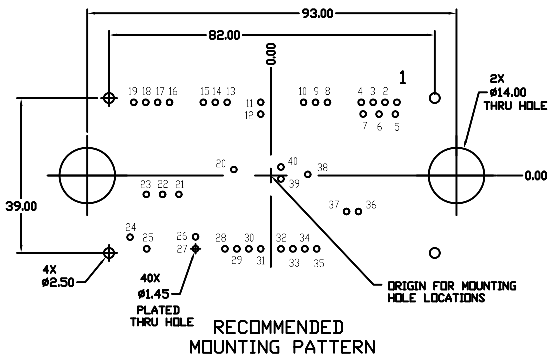
DIM	MILLIMETERS		
	MIN.	NOM.	MAX.
A	11.70	12.00	12.30
A1	4.40	4.70	5.00
A2	16.40	16.70	17.00
A3	16.90	17.30	17.70
A4	13.97	14.18	14.39
b	1.61	1.66	1.71
b1	0.75	0.80	0.85
D	92.90	93.00	93.10
D1	104.45	104.75	105.05
D2	81.80	82.00	82.20
D3	106.90	107.20	107.50
E	46.70	47.00	47.30
E1	44.10	44.40	44.70
E2	38.80	39.00	39.10
P	5.40	5.50	5.60
P1	5.05	5.35	5.65
P2	1.80	2.00	2.20



NOTE 4

PIN	PIN POSITION X	PIN POSITION Y	PIN	PIN POSITION X	PIN POSITION Y
1	31.75	−18.45	21	−23.15	4.75
2	28.75	−18.45	22	−27.25	4.75
3	25.75	−18.45	23	−31.35	4.75
4	22.75	−18.45	24	−35.45	15.50
5	31.35	−15.45	25	−31.25	18.45
6	27.25	−15.45	26	−18.95	18.45
7	24.25	−15.45	27	−18.95	18.45
8	14.25	−18.45	28	−11.55	18.45
9	11.25	−18.45	29	−8.55	18.45
10	8.25	−18.45	30	−5.55	18.45
11	−2.55	−18.45	31	−2.55	18.45
12	−2.55	−15.45	32	2.55	18.45
13	−11.00	−18.45	33	5.55	18.45
14	−14.00	−18.45	34	8.55	18.45
15	−17.00	−18.45	35	11.55	18.45
16	−25.50	−18.45	36	22.05	9.05
17	−28.50	−18.45	37	19.05	9.05
18	−31.50	−18.45	38	9.30	−0.30
19	−34.50	−18.45	39	2.55	0.85
20	−9.30	−1.50	40	2.55	−2.15

PIN	MOUNTING HOLE POSITION X	MOUNTING HOLE POSITION Y	PIN	MOUNTING HOLE POSITION X	MOUNTING HOLE POSITION Y
1	31.75	18.45	21	−23.15	−4.75
2	28.75	18.45	22	−27.25	−4.75
3	25.75	18.45	23	−31.35	−4.75
4	22.75	18.45	24	−35.45	−15.50
5	31.35	15.45	25	−31.25	−18.45
6	27.25	15.45	26	−18.95	−18.45
7	24.25	15.45	27	−18.95	−18.45
8	14.25	18.45	28	−11.55	−18.45
9	11.25	18.45	29	−8.55	−18.45
10	8.25	18.45	30	−5.55	−18.45
11	−2.55	18.45	31	−2.55	−18.45
12	−2.55	15.45	32	2.55	−18.45
13	−11.00	18.45	33	5.55	−18.45
14	−14.00	18.45	34	8.55	−18.45
15	−17.00	18.45	35	11.55	−18.45
16	−25.50	18.45	36	22.05	−9.05
17	−28.50	18.45	37	19.05	−9.05
18	−31.50	18.45	38	9.30	0.30
19	−34.50	18.45	39	2.55	−0.85
20	−9.30	1.50	40	2.55	2.15



NOTES:

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

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