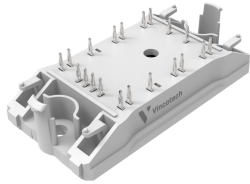
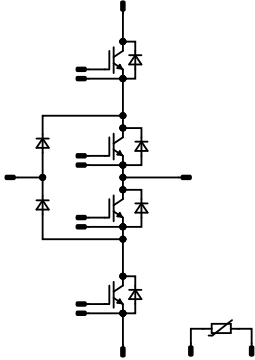




flowNPC 0		1200 V / 100 A	
Features		flow 0 12 mm housing	
<ul style="list-style-type: none">• Latest High Efficient IGBT Technology• Optimized Chipset for Active Power• High Reactive Power Capability			
Target applications		Schematic	
<ul style="list-style-type: none">• Solar Inverters			
Types			
<ul style="list-style-type: none">• 10-PF07NIA100RG-P927F86T			



Vincotech

10-PF07NIA100RG-P927F86T
datasheet

Maximum Ratings

$T_j = 25\text{ °C}$, unless otherwise specified

Parameter	Symbol	Conditions	Value	Unit
-----------	--------	------------	-------	------

Buck Switch

Collector-emitter voltage	V_{CES}		650	V
Collector current	I_C	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	84	A
Repetitive peak collector current	I_{CRM}	t_p limited by T_{jmax}	400	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	137	W
Gate-emitter voltage	V_{GES}		± 30	V
Maximum junction temperature	T_{jmax}		175	°C

Buck Diode

Peak repetitive reverse voltage	V_{RRM}		650	V
Continuous (direct) forward current	I_F	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	81	A
Repetitive peak forward current	I_{FRM}	t_p limited by T_{jmax}	400	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	114	W
Maximum junction temperature	T_{jmax}		175	°C

Boost Switch

Collector-emitter voltage	V_{CES}		650	V
Collector current	I_C	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	84	A
Repetitive peak collector current	I_{CRM}	t_p limited by T_{jmax}	300	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	91	W
Gate-emitter voltage	V_{GES}		± 20	V
Maximum junction temperature	T_{jmax}		175	°C



Vincotech

10-PF07NIA100RG-P927F86T
datasheet

Maximum Ratings

$T_j = 25\text{ °C}$, unless otherwise specified

Parameter	Symbol	Conditions	Value	Unit
Boost Diode				
Peak repetitive reverse voltage	V_{RRM}		650	V
Continuous (direct) forward current	I_F	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	43	A
Repetitive peak forward current	I_{FRM}	t_p limited by T_{jmax}	200	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	62	W
Maximum junction temperature	T_{jmax}		175	°C

Boost Sw. Inv. Diode

Peak repetitive reverse voltage	V_{RRM}		650	V
Continuous (direct) forward current	I_F	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	43	A
Repetitive peak forward current	I_{FRM}	t_p limited by T_{jmax}	200	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	62	W
Maximum junction temperature	T_{jmax}		175	°C

Module Properties

Thermal Properties

Storage temperature	T_{stg}		-40...+125	°C
Operation temperature under switching condition	T_{jop}		-40...+($T_{jmax} - 25$)	°C

Isolation Properties

Isolation voltage	V_{isol}	DC Test Voltage* $t_p = 2\text{ s}$	6000	V
Isolation voltage	V_{isol}	AC Voltage $t_p = 1\text{ min}$	2500	V
Creepage distance			min. 12,7	mm
Clearance			8,75	mm
Comparative Tracking Index	CTI		≥ 200	

*100 % tested in production



Vincotech

10-PF07NIA100RG-P927F86T
datasheet

Characteristic Values

Parameter	Symbol	Conditions					Values			Unit
		V_{GE} [V] V_{GS} [V]	V_{CE} [V] V_{DS} [V] V_F [V]	I_C [A] I_D [A] I_F [A]	T_j [°C]	Min	Typ	Max		

Buck Switch

Static

Gate-emitter threshold voltage	$V_{GE(th)}$			5	0,07	25	5	6	7	V
Collector-emitter saturation voltage	$V_{CE(sat)}$		15		100	25 125 150		1,5 1,66 1,7	1,9	V
Collector-emitter cut-off current	I_{CES}		0	650		25			0,02	mA
Gate-emitter leakage current	I_{GES}		30	0		25			0,4	μ A
Internal gate resistance	r_g							None		Ω
Input capacitance	C_{ies}							8400		pF
Output capacitance	C_{oes}	$f = 1$ Mhz	0	30		25		208		pF
Reverse transfer capacitance	C_{res}							158		pF
Gate charge	Q_g		15	400	100	25		282		nC

Thermal

Thermal resistance junction to sink*	$R_{th(j-s)}$	$\lambda_{paste} = 3,4$ W/mK (PSX)						0,69		K/W
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*Only valid with pre-applied Vincotech thermal interface material.

Dynamic

Turn-on delay time	$t_{d(on)}$					25 125 150		57 61 58		ns
Rise time	t_r					25 125 150		8 9 8		ns
Turn-off delay time	$t_{d(off)}$					25 125 150		141 156 162		ns
Fall time	t_f					25 125 150		28,49 51,49 67,27		ns
Turn-on energy (per pulse)	E_{on}	$Q_{rFWD} = 1,86$ μ C $Q_{rFWD} = 3,39$ μ C $Q_{rFWD} = 3,94$ μ C				25 125 150		0,408 0,434 0,454		mWs
Turn-off energy (per pulse)	E_{off}					25 125 150		0,67 1,01 1,12		mWs



Vincotech

Characteristic Values

Parameter	Symbol	Conditions					Values			Unit
		V_{GE} [V] V_{GS} [V]	V_{CE} [V] V_{DS} [V] V_F [V]	I_C [A] I_D [A] I_F [A]	T_j [°C]	Min	Typ	Max		

Buck Diode

Static

Forward voltage	V_F				100	25 125 150		1,5 1,57 1,54	1,9	V
Reverse leakage current	I_R	$V_T = 650$ V				25			20	μA

Thermal

Thermal resistance junction to sink*	$R_{th(j-s)}$	$\lambda_{paste} = 3,4$ W/mK (PSX)						0,84		K/W
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*Only valid with pre-applied Vincotech thermal interface material.

Dynamic

Peak recovery current	I_{RRM}					25 125 150		114,01 124,81 136,69		A
Reverse recovery time	t_{rr}					25 125 150		27,43 57,66 63,14		ns
Recovered charge	Q_r	$di/dt=7268$ A/μs $di/dt=6347$ A/μs $di/dt=6286$ A/μs	-5/15	350	45	25 125 150		1,86 3,39 3,94		μC
Reverse recovered energy	E_{rec}					25 125 150		0,608 1,08 1,12		mWs
Peak rate of fall of recovery current	$(di_{rr}/dt)_{max}$					25 125 150		12744 8762 9089		A/μs



Vincotech

10-PF07NIA100RG-P927F86T
datasheet

Characteristic Values

Parameter	Symbol	Conditions					Values			Unit
		V_{GE} [V] V_{GS} [V]	V_{CE} [V] V_{DS} [V] V_F [V]	I_C [A] I_D [A] I_F [A]	T_j [°C]	Min	Typ	Max		

Boost Switch

Static

Gate-emitter threshold voltage	$V_{GE(th)}$	$V_{CE} = V_{GE}$			0,08	25	2,6	4,4	6,4	V
Collector-emitter saturation voltage	$V_{CE(sat)}$		15		75	25 125 150		1,09 1,05 1,04	1,5	V
Collector-emitter cut-off current	I_{CES}		0	650		25			250	μA
Gate-emitter leakage current	I_{GES}		20	0		25			400	nA
Internal gate resistance	r_g							None		Ω
Input capacitance	C_{ies}							16400		pF
Output capacitance	C_{oes}	$f = 1$ Mhz	0	30		25		85		pF
Reverse transfer capacitance	C_{res}							74		pF
Gate charge	Q_g	Gate charge	15	400	75	25		830		nC

Thermal

Thermal resistance junction to sink*	$R_{th(j-s)}$	$\lambda_{paste} = 3,4$ W/mK (PSX)						1,05		K/W
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*Only valid with pre-applied Vincotech thermal interface material.

Dynamic

Turn-on delay time	$t_{d(on)}$					25 125 150		311 312 314		ns
Rise time	t_r	$R_{gon} = 8 \Omega$ $R_{goff} = 8 \Omega$				25 125 150		17 20 20		ns
Turn-off delay time	$t_{d(off)}$		±15	350	75	25 125 150		375 403 409		ns
Fall time	t_f					25 125 150		12,48 22,06 28,14		ns
Turn-on energy (per pulse)	E_{on}	$Q_{fFWD} = 2,21 \mu C$ $Q_{fFWD} = 3,63 \mu C$ $Q_{fFWD} = 4,34 \mu C$				25 125 150		0,838 1,09 1,26		mWs
Turn-off energy (per pulse)	E_{off}					25 125 150		1,37 1,99 2,26		mWs



Vincotech

Characteristic Values

Parameter	Symbol	Conditions					Values			Unit
		V_{GE} [V] V_{GS} [V]	V_{CE} [V] V_{DS} [V] V_F [V]	I_C [A] I_D [A] I_F [A]	T_j [°C]	Min	Typ	Max		

Boost Diode

Static

Forward voltage	V_F				50	25 125 150		1,5 1,57 1,54	1,9	V
Reverse leakage current	I_R	$V_T = 650$ V				25			10	μA

Thermal

Thermal resistance junction to sink*	$R_{th(j-s)}$	$\lambda_{paste} = 3,4$ W/mK (PSX)						1,54		K/W
--------------------------------------	---------------	---------------------------------------	--	--	--	--	--	------	--	-----

*Only valid with pre-applied Vincotech thermal interface material.

Dynamic

Peak recovery current	I_{RRM}					25 125 150		92,72 88,4 88,19		A
Reverse recovery time	t_{rr}					25 125 150		49,88 106,02 130,54		ns
Recovered charge	Q_r	$di/dt=6000$ A/μs $di/dt=4730$ A/μs $di/dt=4461$ A/μs	±15	350	75	25 125 150		2,21 3,63 4,34		μC
Reverse recovered energy	E_{rec}					25 125 150		0,442 0,837 1,04		mWs
Peak rate of fall of recovery current	$(di_{rr}/dt)_{max}$					25 125 150		7801 3264 2390		A/μs



Vincotech

Characteristic Values

Parameter	Symbol	Conditions						Values			Unit
		V_{GS} [V]	V_{GE} [V]	V_{DS} [V]	V_{CE} [V]	I_D [A]	I_C [A]	T_j [°C]	Min	Typ	

Boost Sw. Inv. Diode

Static

Forward voltage	V_F				50	25 125 150		1,5 1,57 1,54	1,9	V
Reverse leakage current	I_R	$V_i = 650$ V				25			10	μA

Thermal

Thermal resistance junction to sink*	$R_{th(j-s)}$	$\lambda_{paste} = 3,4$ W/mK (PSX)						1,54		K/W
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*Only valid with pre-applied Vincotech thermal interface material.

Thermistor

Static

Rated resistance	R					25		22		kΩ
Deviation of R_{100}	$\Delta_{R/R}$	$R_{100} = 1484$ Ω				100	-5		5	%
Power dissipation	P							5		mW
Power dissipation constant	d					25		1,5		mW/K
B-value	$B_{(25/50)}$	Tol. ±1 %						3962		K
B-value	$B_{(25/100)}$	Tol. ±1 %						4000		K
Vincotech Thermistor Reference									I	



Buck Switch Characteristics

figure 1. IGBT

Typical output characteristics
 $I_C = f(V_{CE})$

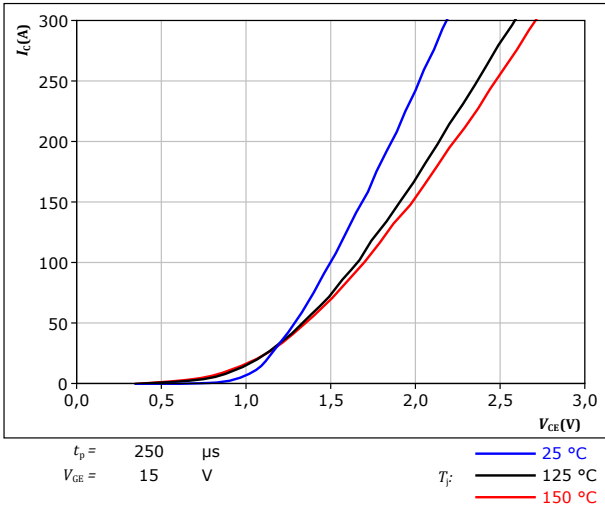


figure 2. IGBT

Typical output characteristics
 $I_C = f(V_{CE})$

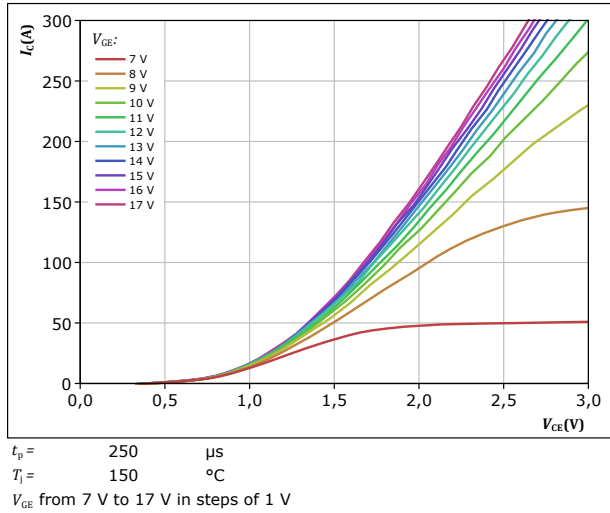


figure 3. IGBT

Typical transfer characteristics
 $I_C = f(V_{GE})$

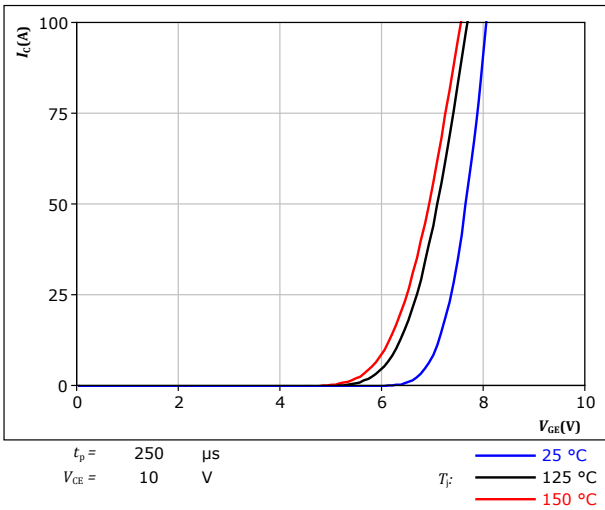
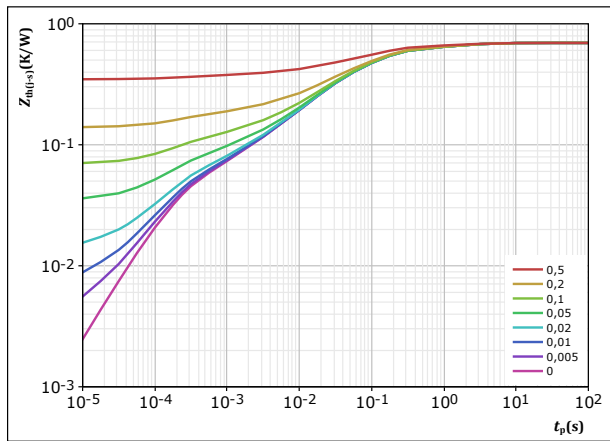


figure 4. IGBT

Transient thermal impedance as a function of pulse width
 $Z_{th(j-s)} = f(t_p)$



IGBT thermal model values

R (K/W)	τ (s)
4,18E-02	2,94E+00
6,64E-02	8,08E-01
3,20E-01	1,03E-01
1,80E-01	1,80E-02
4,05E-02	2,12E-03
4,57E-02	2,08E-04

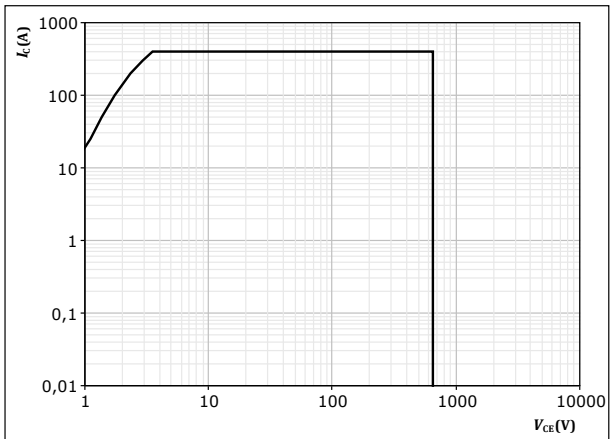


Buck Switch Characteristics

figure 5. IGBT

Safe operating area

$$I_C = f(V_{CE})$$



$D =$ single pulse
 $T_s = 80$ °C
 $V_{CE} = 15$ V
 $T_j = T_{jmax}$



Buck Diode Characteristics

figure 6. FWD

Typical forward characteristics

$$I_F = f(V_F)$$

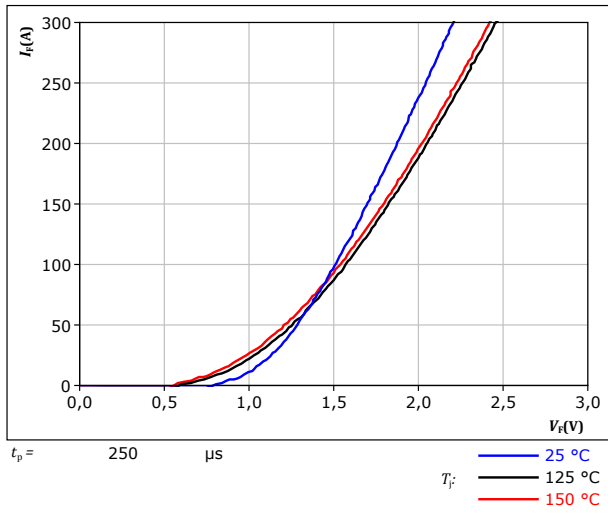
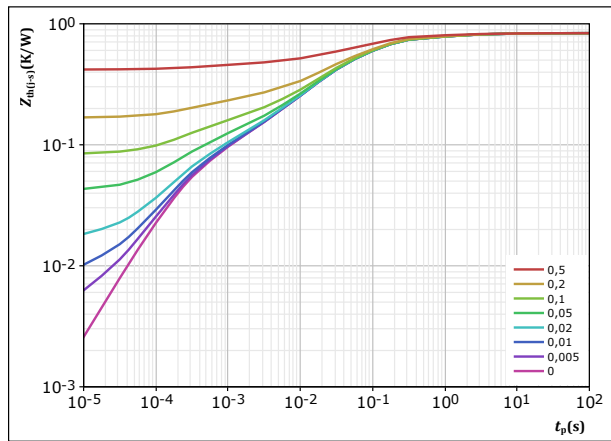


figure 7. FWD

Transient thermal impedance as a function of pulse width

$$Z_{th(j-s)} = f(t_p)$$



$D = t_p / T$
 $R_{th(j-s)} = 0,837 \text{ K/W}$
 IGBT thermal model values

R (K/W)	τ (s)
1,35E-02	1,32E+01
7,97E-02	1,40E+00
3,67E-01	1,12E-01
2,58E-01	1,94E-02
5,86E-02	2,17E-03
6,01E-02	2,75E-04



Boost Switch Characteristics

figure 8. IGBT

Typical output characteristics
 $I_C = f(V_{CE})$

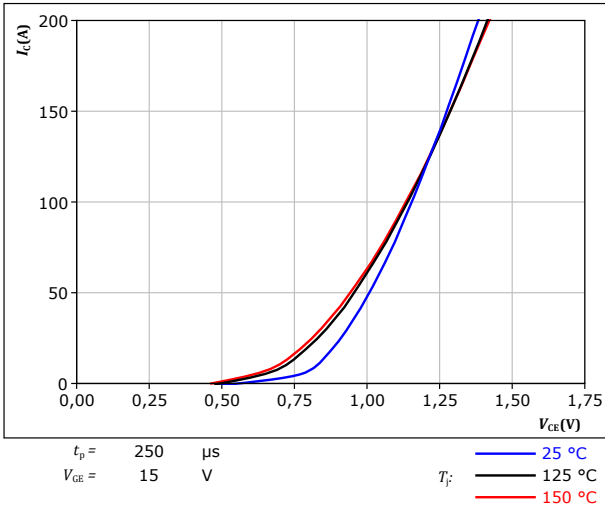


figure 9. IGBT

Typical output characteristics
 $I_C = f(V_{CE})$

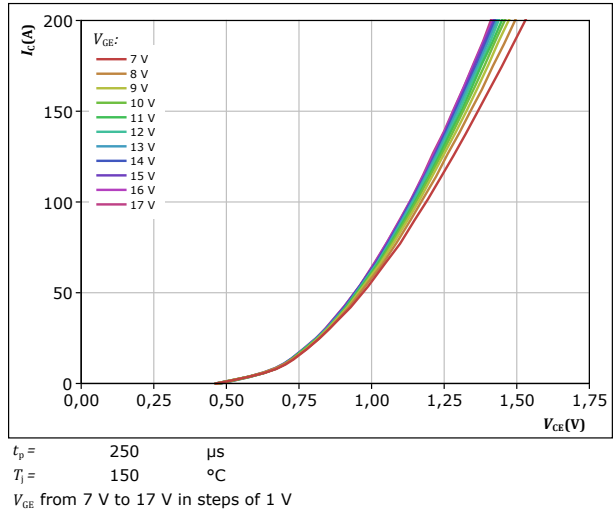


figure 10. IGBT

Typical transfer characteristics
 $I_C = f(V_{GE})$

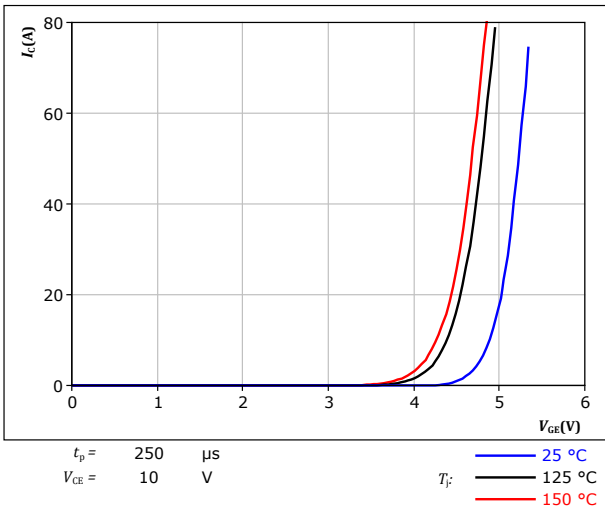
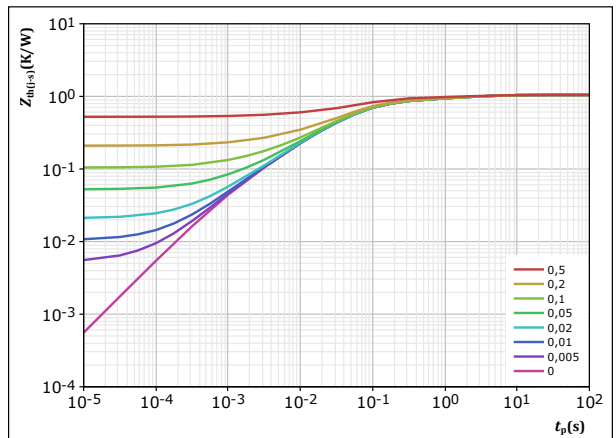


figure 11. IGBT

Transient thermal impedance as a function of pulse width
 $Z_{th(j-s)} = f(t_p)$



IGBT thermal model values

R (K/W)	τ (s)
1,08E-01	3,50E+00
9,93E-02	7,46E-01
3,23E-01	1,12E-01
4,00E-01	3,60E-02
9,35E-02	5,79E-03
2,31E-02	9,07E-04

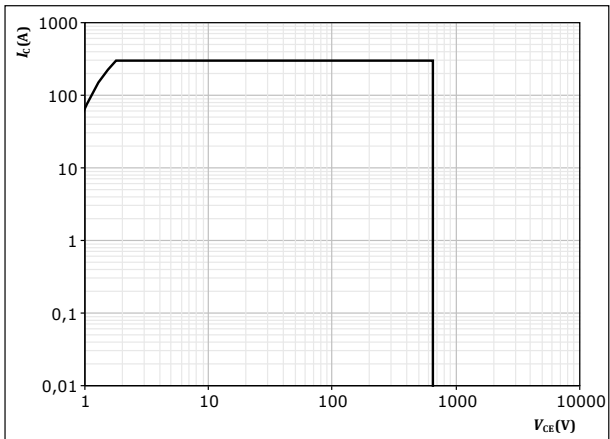


Boost Switch Characteristics

figure 12. IGBT

Safe operating area

$$I_C = f(V_{CE})$$



D = single pulse
T_s = 80 °C
V_{CE} = 15 V
T_j = T_{jmax}



Boost Diode Characteristics

figure 13. FWD

Typical forward characteristics

$$I_F = f(V_F)$$

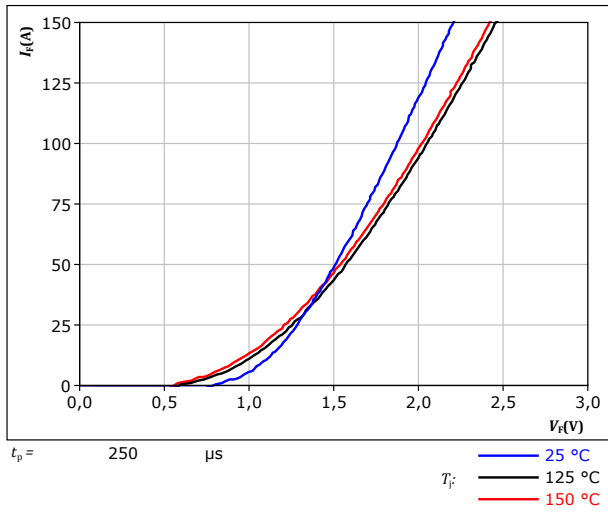
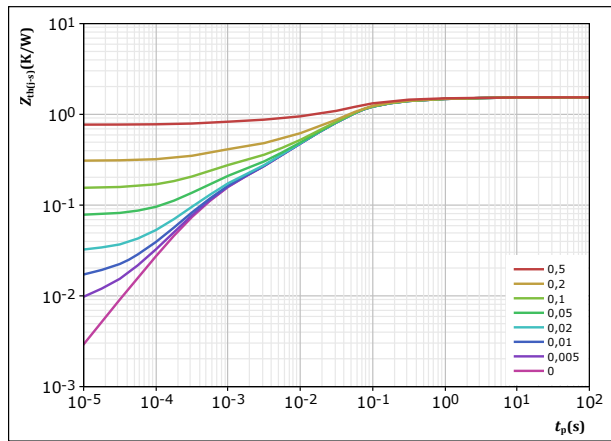


figure 14. FWD

Transient thermal impedance as a function of pulse width

$$Z_{th(j-s)} = f(t_p)$$



$D = t_p / T$
 $R_{th(j-s)} = 1,539 \text{ K/W}$
 IGBT thermal model values

R (K/W)	τ (s)
8,05E-02	2,80E+00
2,11E-01	2,60E-01
9,12E-01	4,57E-02
2,06E-01	6,78E-03
1,30E-01	5,33E-04



Boost Sw. Inv. Diode Characteristics

figure 15. FWD

Typical forward characteristics

$$I_F = f(V_F)$$

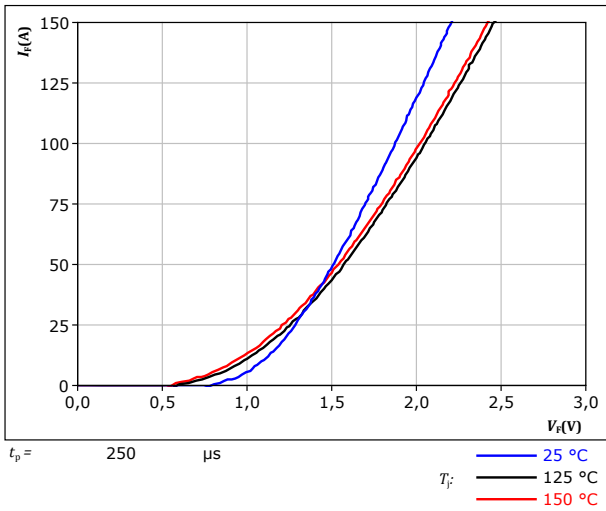
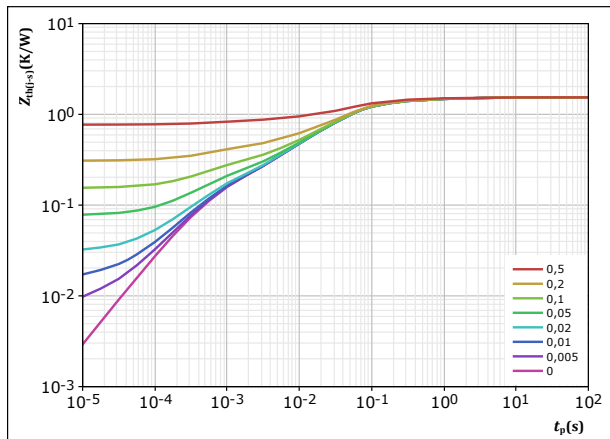


figure 16. FWD

Transient thermal impedance as a function of pulse width

$$Z_{th(j-s)} = f(t_p)$$



$D = t_p / T$
 $R_{th(j-s)} = 1,539 \text{ K/W}$
 IGBT thermal model values

R (K/W)	τ (s)
8,05E-02	2,80E+00
2,11E-01	2,60E-01
9,12E-01	4,57E-02
2,06E-01	6,78E-03
1,30E-01	5,33E-04

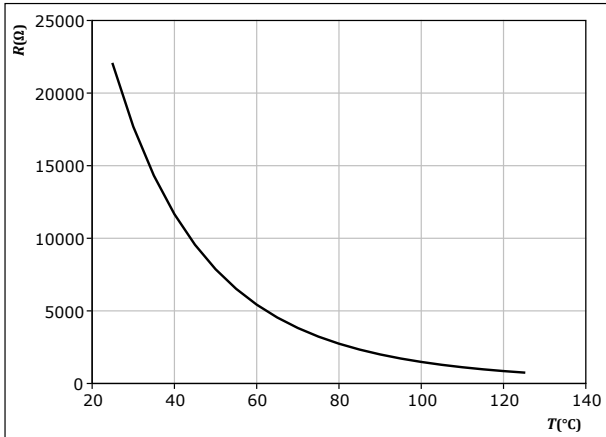


Thermistor Characteristics

figure 17. Thermistor

Typical NTC characteristic as function of temperature

$$R_T = f(T)$$

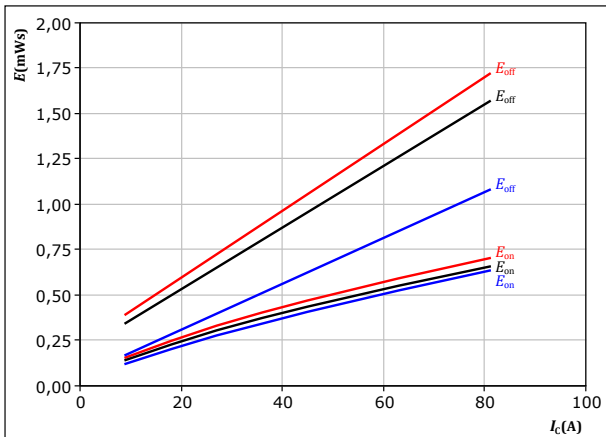




Buck Switching Characteristics

figure 18. IGBT

Typical switching energy losses as a function of collector current
 $E = f(I_c)$

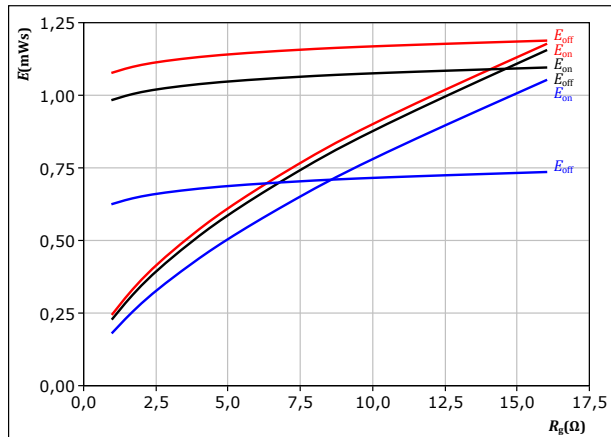


With an inductive load at
 $V_{CE} = 350$ V
 $V_{GE} = -5/15$ V
 $R_{gon} = 4$ Ω
 $R_{goff} = 4$ Ω

T_j : 25 °C (blue), 125 °C (black), 150 °C (red)

figure 19. IGBT

Typical switching energy losses as a function of gate resistor
 $E = f(R_g)$

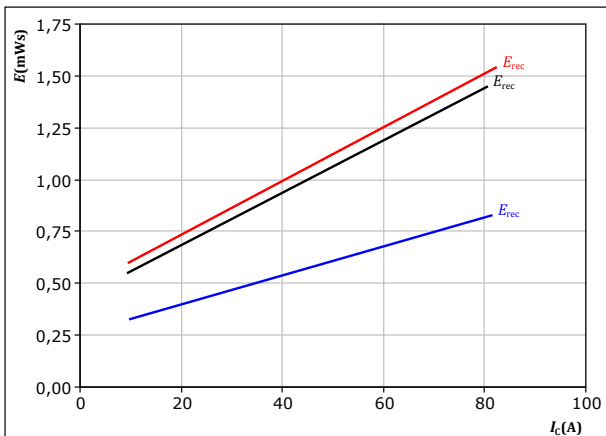


With an inductive load at
 $V_{CE} = 350$ V
 $V_{GE} = -5/15$ V
 $I_c = 45$ A

T_j : 25 °C (blue), 125 °C (black), 150 °C (red)

figure 20. FWD

Typical reverse recovered energy loss as a function of collector current
 $E_{rec} = f(I_c)$

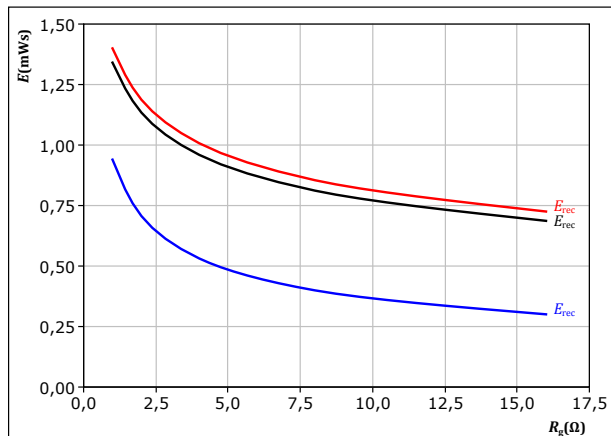


With an inductive load at
 $V_{CE} = 350$ V
 $V_{GE} = -5/15$ V
 $R_{gon} = 4$ Ω

T_j : 25 °C (blue), 125 °C (black), 150 °C (red)

figure 21. FWD

Typical reverse recovered energy loss as a function of gate resistor
 $E_{rec} = f(R_g)$



With an inductive load at
 $V_{CE} = 350$ V
 $V_{GE} = -5/15$ V
 $I_c = 45$ A

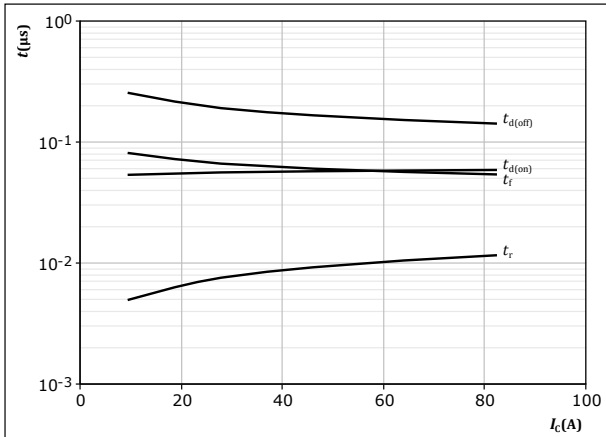
T_j : 25 °C (blue), 125 °C (black), 150 °C (red)



Buck Switching Characteristics

figure 22. IGBT

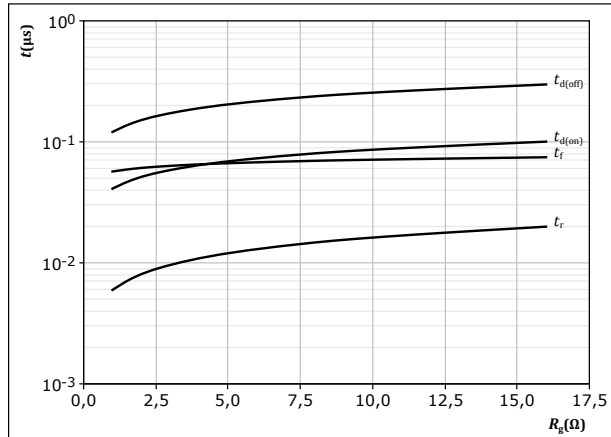
Typical switching times as a function of collector current
 $t = f(I_c)$



With an inductive load at
 $T_j = 150 \text{ }^\circ\text{C}$
 $V_{CE} = 350 \text{ V}$
 $V_{GE} = -5/15 \text{ V}$
 $R_{gon} = 4 \text{ } \Omega$
 $R_{goff} = 4 \text{ } \Omega$

figure 23. IGBT

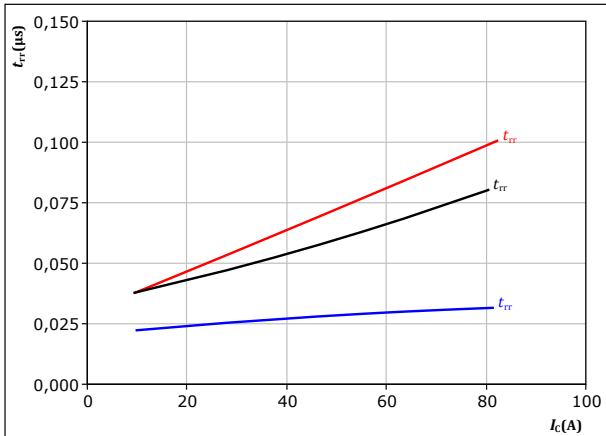
Typical switching times as a function of gate resistor
 $t = f(R_g)$



With an inductive load at
 $T_j = 150 \text{ }^\circ\text{C}$
 $V_{CE} = 350 \text{ V}$
 $V_{GE} = -5/15 \text{ V}$
 $I_c = 45 \text{ A}$

figure 24. FWD

Typical reverse recovery time as a function of collector current
 $t_{rr} = f(I_c)$

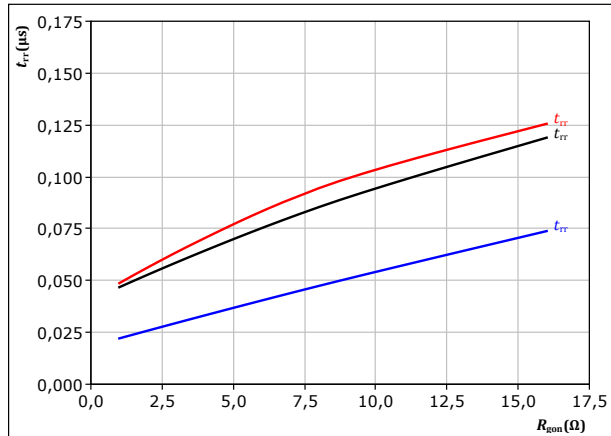


With an inductive load at
 $V_{CE} = 350 \text{ V}$
 $V_{GE} = -5/15 \text{ V}$
 $R_{gon} = 4 \text{ } \Omega$

T_j :
— 25 °C
— 125 °C
— 150 °C

figure 25. FWD

Typical reverse recovery time as a function of IGBT turn on gate resistor
 $t_{rr} = f(R_{gon})$



With an inductive load at
 $V_{CE} = 350 \text{ V}$
 $V_{GE} = -5/15 \text{ V}$
 $I_c = 45 \text{ A}$

T_j :
— 25 °C
— 125 °C
— 150 °C

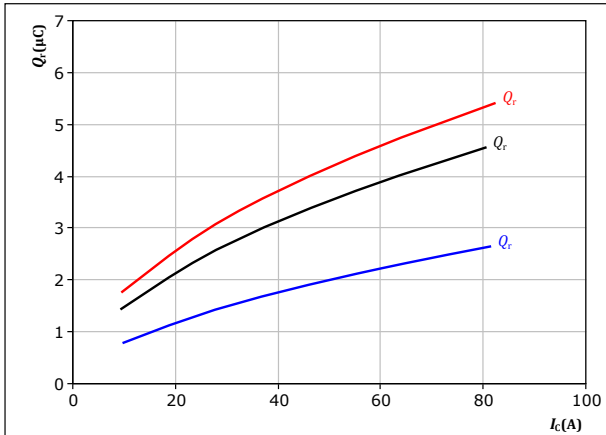


Buck Switching Characteristics

figure 26. FWD

Typical recovered charge as a function of collector current

$$Q_r = f(I_c)$$



With an inductive load at

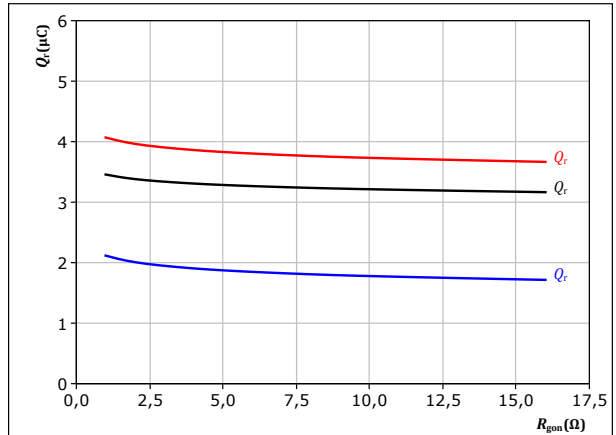
$V_{CE} = 350$ V
 $V_{GE} = -5/15$ V
 $R_{gon} = 4$ Ω

T_j : 25 °C
125 °C
150 °C

figure 27. FWD

Typical recovered charge as a function of turn on gate resistor

$$Q_r = f(R_{gon})$$



With an inductive load at

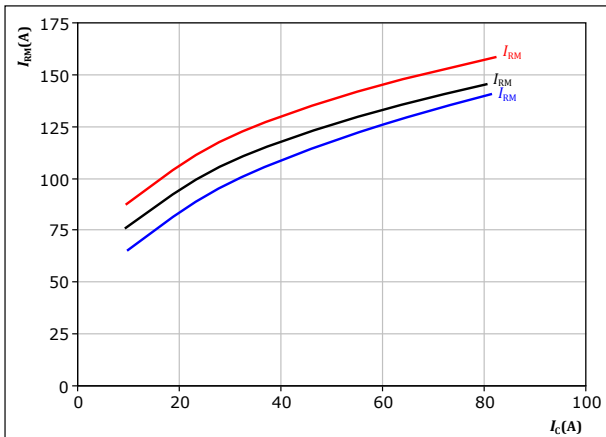
$V_{CE} = 350$ V
 $V_{GE} = -5/15$ V
 $I_c = 45$ A

T_j : 25 °C
125 °C
150 °C

figure 28. FWD

Typical peak reverse recovery current as a function of collector current

$$I_{RM} = f(I_c)$$



With an inductive load at

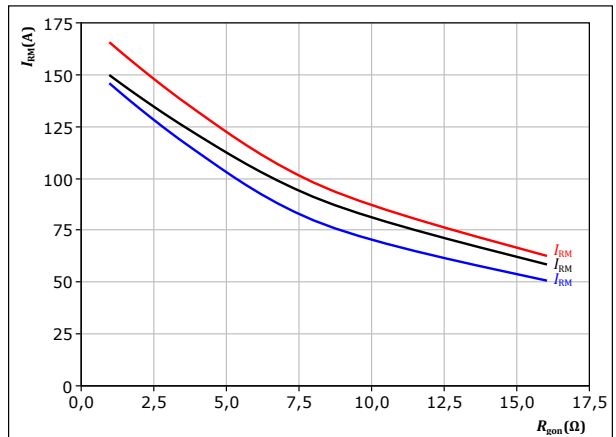
$V_{CE} = 350$ V
 $V_{GE} = -5/15$ V
 $R_{gon} = 4$ Ω

T_j : 25 °C
125 °C
150 °C

figure 29. FWD

Typical peak reverse recovery current as a function of turn on gate resistor

$$I_{RM} = f(R_{gon})$$



With an inductive load at

$V_{CE} = 350$ V
 $V_{GE} = -5/15$ V
 $I_c = 45$ A

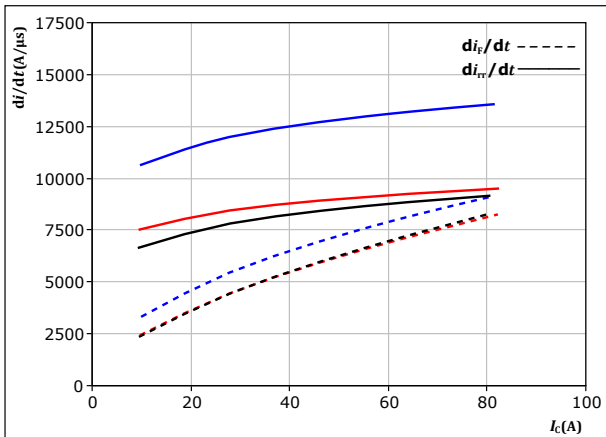
T_j : 25 °C
125 °C
150 °C



Buck Switching Characteristics

figure 30. FWD

Typical rate of fall of forward and reverse recovery current as a function of collector current
 $di_f/dt, di_{rr}/dt = f(I_C)$

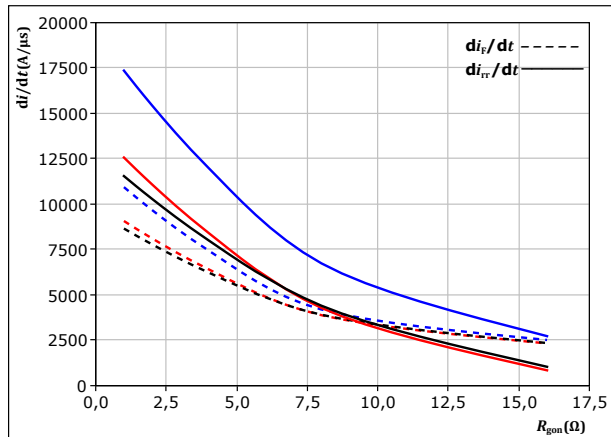


With an inductive load at

$V_{CE} =$	350	V	$T_j:$	25 °C
$V_{GE} =$	-5/15	V		125 °C
$R_{gon} =$	4	Ω		150 °C

figure 31. FWD

Typical rate of fall of forward and reverse recovery current as a function of turn on gate resistor
 $di_f/dt, di_{rr}/dt = f(R_{gon})$

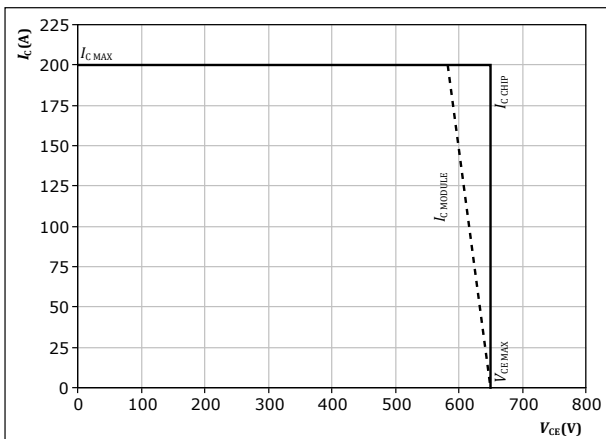


With an inductive load at

$V_{CE} =$	350	V	$T_j:$	25 °C
$V_{GE} =$	-5/15	V		125 °C
$I_C =$	45	A		150 °C

figure 32. IGBT

Reverse bias safe operating area
 $I_C = f(V_{CE})$



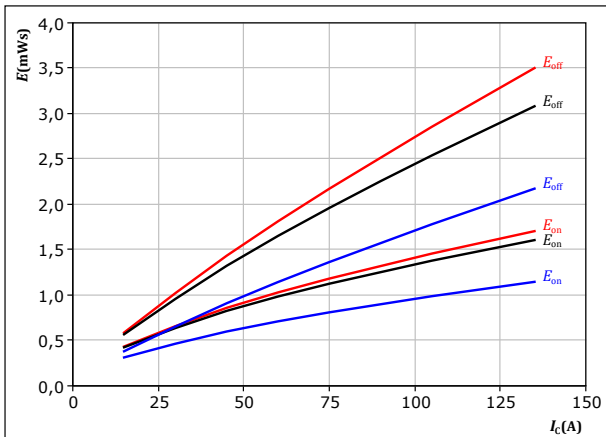
At $T_j = 150$ °C
 $R_{gon} = 4$ Ω
 $R_{goff} = 4$ Ω



Boost Switching Characteristics

figure 33. IGBT

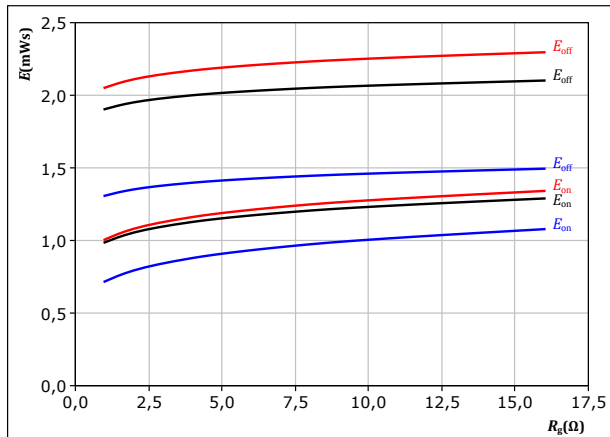
Typical switching energy losses as a function of collector current
 $E = f(I_c)$



With an inductive load at
 $V_{CE} = 350$ V
 $V_{GE} = \pm 15$ V
 $R_{gon} = 8$ Ω
 $R_{goff} = 8$ Ω
 T_j : 25 °C (blue), 125 °C (black), 150 °C (red)

figure 34. IGBT

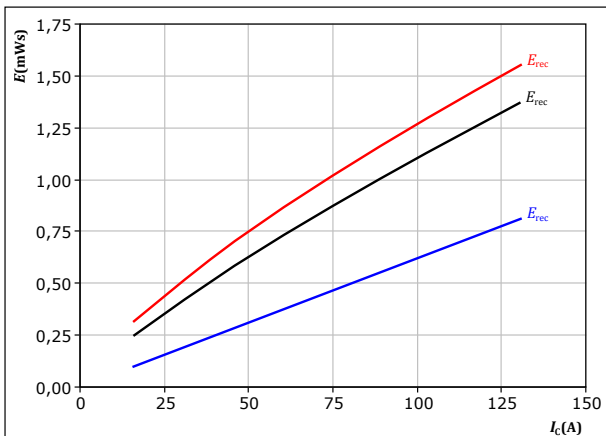
Typical switching energy losses as a function of gate resistor
 $E = f(R_g)$



With an inductive load at
 $V_{CE} = 350$ V
 $V_{GE} = \pm 15$ V
 $I_c = 75$ A
 T_j : 25 °C (blue), 125 °C (black), 150 °C (red)

figure 35. FWD

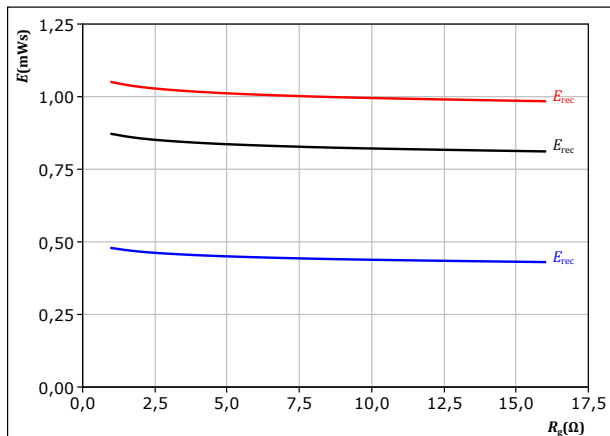
Typical reverse recovered energy loss as a function of collector current
 $E_{rec} = f(I_c)$



With an inductive load at
 $V_{CE} = 350$ V
 $V_{GE} = \pm 15$ V
 $R_{gon} = 8$ Ω
 T_j : 25 °C (blue), 125 °C (black), 150 °C (red)

figure 36. FWD

Typical reverse recovered energy loss as a function of gate resistor
 $E_{rec} = f(R_g)$



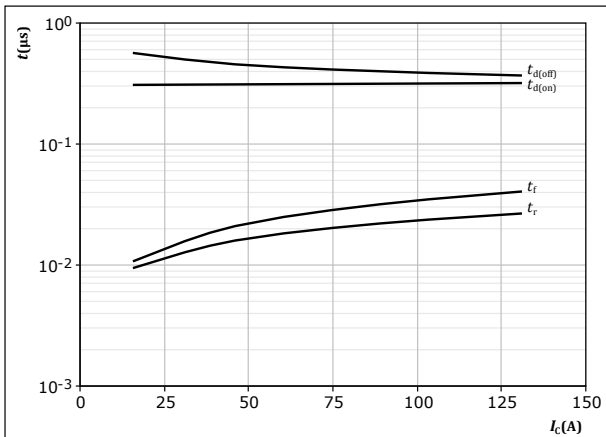
With an inductive load at
 $V_{CE} = 350$ V
 $V_{GE} = \pm 15$ V
 $I_c = 75$ A
 T_j : 25 °C (blue), 125 °C (black), 150 °C (red)



Boost Switching Characteristics

figure 37. IGBT

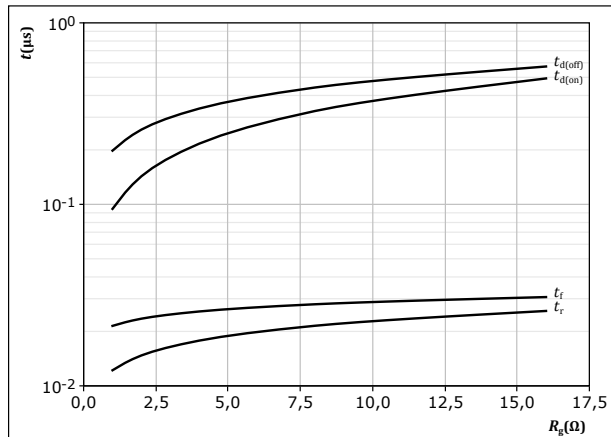
Typical switching times as a function of collector current
 $t = f(I_c)$



With an inductive load at
 $T_j = 150 \text{ }^\circ\text{C}$
 $V_{CE} = 350 \text{ V}$
 $V_{GE} = \pm 15 \text{ V}$
 $R_{gon} = 8 \text{ } \Omega$
 $R_{goff} = 8 \text{ } \Omega$

figure 38. IGBT

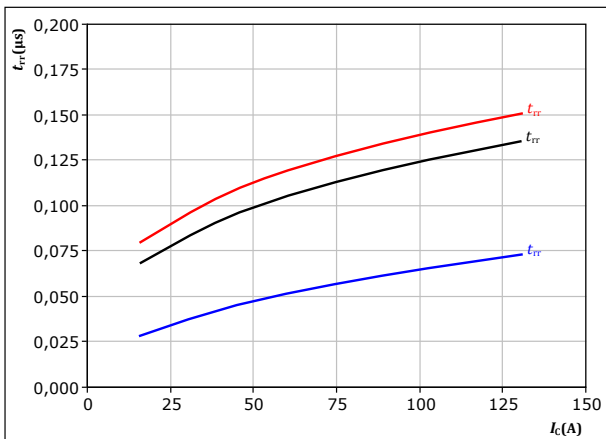
Typical switching times as a function of gate resistor
 $t = f(R_g)$



With an inductive load at
 $T_j = 150 \text{ }^\circ\text{C}$
 $V_{CE} = 350 \text{ V}$
 $V_{GE} = \pm 15 \text{ V}$
 $I_c = 75 \text{ A}$

figure 39. FWD

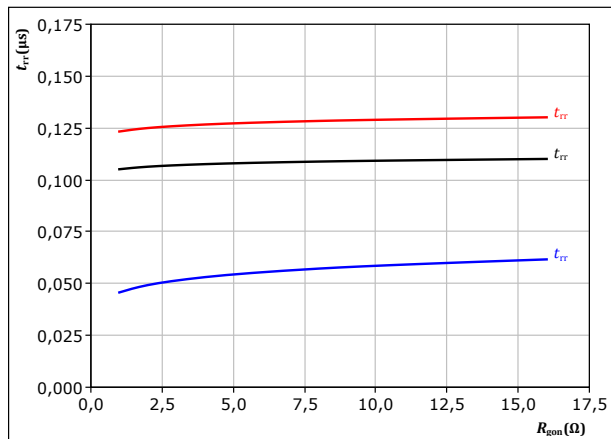
Typical reverse recovery time as a function of collector current
 $t_{rr} = f(I_c)$



With an inductive load at
 $V_{CE} = 350 \text{ V}$
 $V_{GE} = \pm 15 \text{ V}$
 $R_{gon} = 8 \text{ } \Omega$
 $T_j: \text{ } \text{---} 25 \text{ }^\circ\text{C}$
 $\text{---} 125 \text{ }^\circ\text{C}$
 $\text{---} 150 \text{ }^\circ\text{C}$

figure 40. FWD

Typical reverse recovery time as a function of IGBT turn on gate resistor
 $t_{rr} = f(R_{gon})$



With an inductive load at
 $V_{CE} = 350 \text{ V}$
 $V_{GE} = \pm 15 \text{ V}$
 $I_c = 75 \text{ A}$
 $T_j: \text{ } \text{---} 25 \text{ }^\circ\text{C}$
 $\text{---} 125 \text{ }^\circ\text{C}$
 $\text{---} 150 \text{ }^\circ\text{C}$

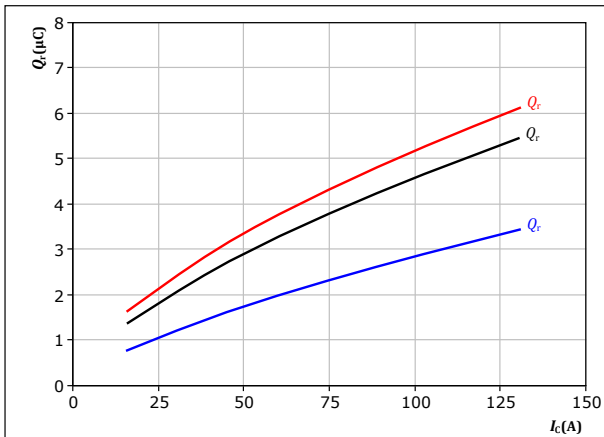


Boost Switching Characteristics

figure 41. FWD

Typical recovered charge as a function of collector current

$$Q_r = f(I_c)$$



With an inductive load at

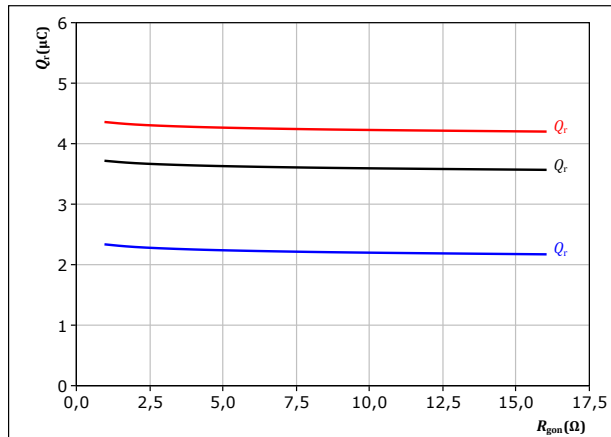
$V_{CE} = 350 \text{ V}$
 $V_{GE} = \pm 15 \text{ V}$
 $R_{gon} = 8 \ \Omega$

T_j : 25 °C (blue)
 125 °C (black)
 150 °C (red)

figure 42. FWD

Typical recovered charge as a function of turn on gate resistor

$$Q_r = f(R_{gon})$$



With an inductive load at

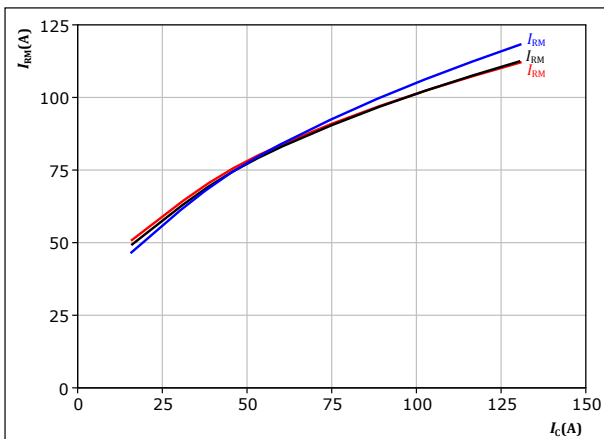
$V_{CE} = 350 \text{ V}$
 $V_{GE} = \pm 15 \text{ V}$
 $I_c = 75 \text{ A}$

T_j : 25 °C (blue)
 125 °C (black)
 150 °C (red)

figure 43. FWD

Typical peak reverse recovery current as a function of collector current

$$I_{RM} = f(I_c)$$



With an inductive load at

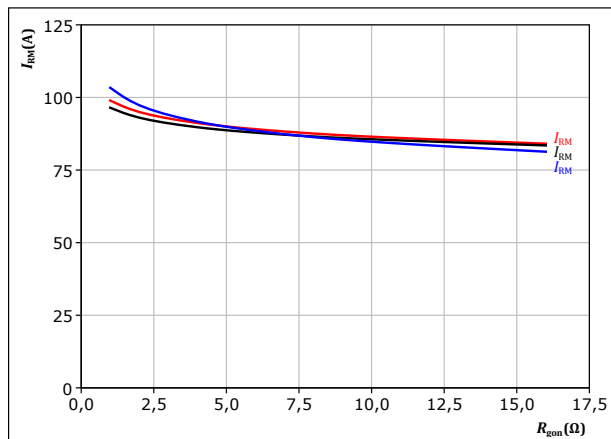
$V_{CE} = 350 \text{ V}$
 $V_{GE} = \pm 15 \text{ V}$
 $R_{gon} = 8 \ \Omega$

T_j : 25 °C (blue)
 125 °C (black)
 150 °C (red)

figure 44. FWD

Typical peak reverse recovery current as a function of turn on gate resistor

$$I_{RM} = f(R_{gon})$$



With an inductive load at

$V_{CE} = 350 \text{ V}$
 $V_{GE} = \pm 15 \text{ V}$
 $I_c = 75 \text{ A}$

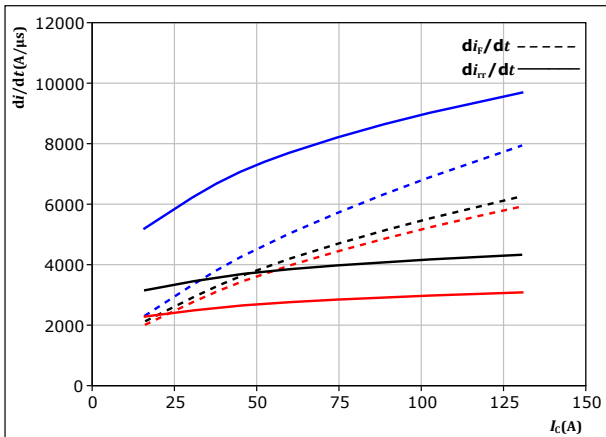
T_j : 25 °C (blue)
 125 °C (black)
 150 °C (red)



Boost Switching Characteristics

figure 45. FWD

Typical rate of fall of forward and reverse recovery current as a function of collector current
 $di_i/dt, di_r/dt = f(I_c)$



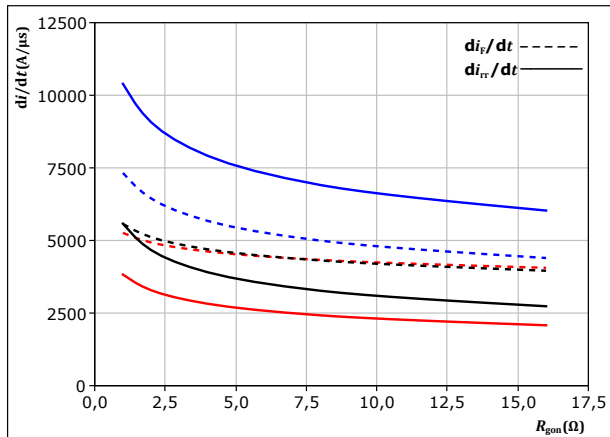
With an inductive load at

$V_{CE} = 350 \text{ V}$
 $V_{GE} = \pm 15 \text{ V}$
 $R_{gon} = 8 \ \Omega$

T_j : 25 °C
 125 °C
 150 °C

figure 46. FWD

Typical rate of fall of forward and reverse recovery current as a function of turn on gate resistor
 $di_i/dt, di_r/dt = f(R_{gon})$



With an inductive load at

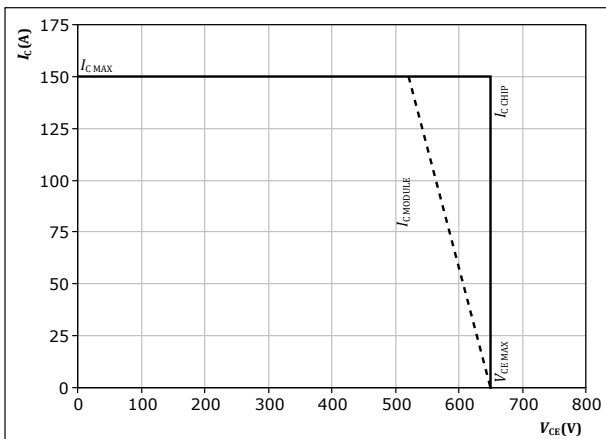
$V_{CE} = 350 \text{ V}$
 $V_{GE} = \pm 15 \text{ V}$
 $I_c = 75 \text{ A}$

T_j : 25 °C
 125 °C
 150 °C

figure 47. IGBT

Reverse bias safe operating area

$I_c = f(V_{CE})$



At $T_j = 150 \text{ °C}$
 $R_{gon} = 8 \ \Omega$
 $R_{goff} = 8 \ \Omega$



Switching Definitions

figure 48. IGBT

Turn-off Switching Waveforms & definition of t_{doff} , t_{Eoff} (t_{Eoff} = integrating time for E_{off})

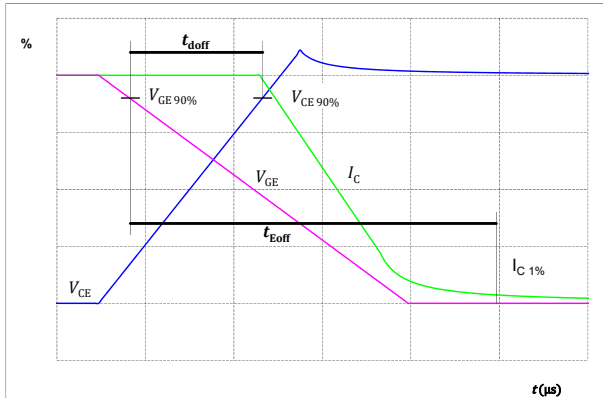


figure 49. IGBT

Turn-on Switching Waveforms & definition of t_{don} , t_{Eon} (t_{Eon} = integrating time for E_{on})

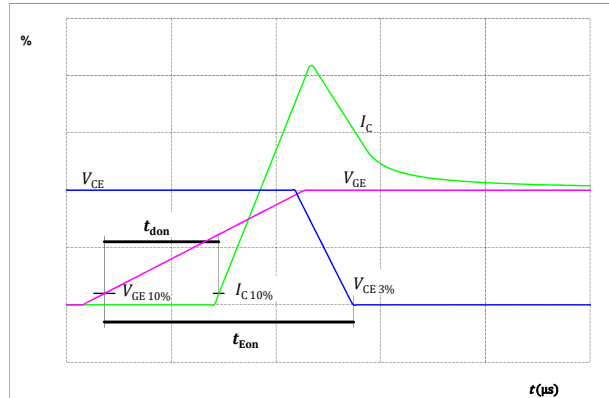


figure 50. IGBT

Turn-off Switching Waveforms & definition of t_f

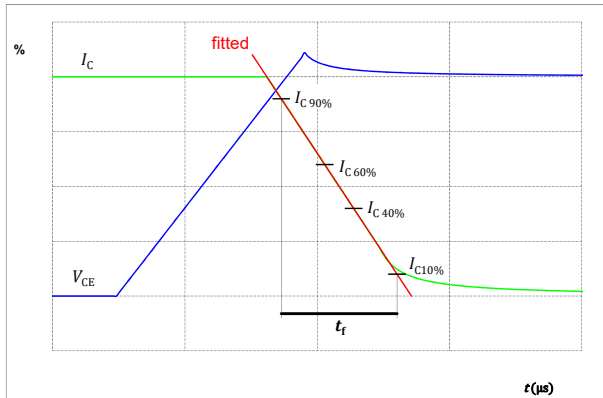
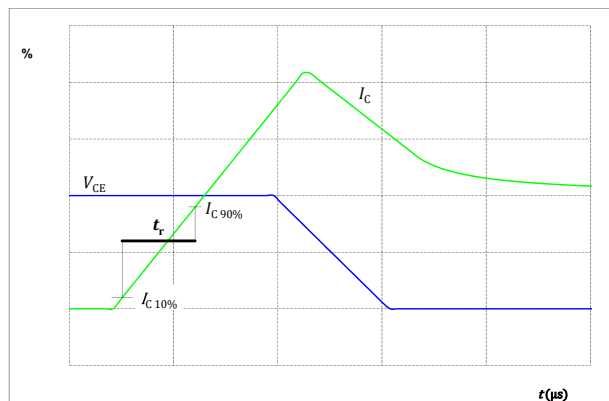


figure 51. IGBT

Turn-on Switching Waveforms & definition of t_r





Switching Definitions

figure 52. FWD

Turn-off Switching Waveforms & definition of t_{rr}

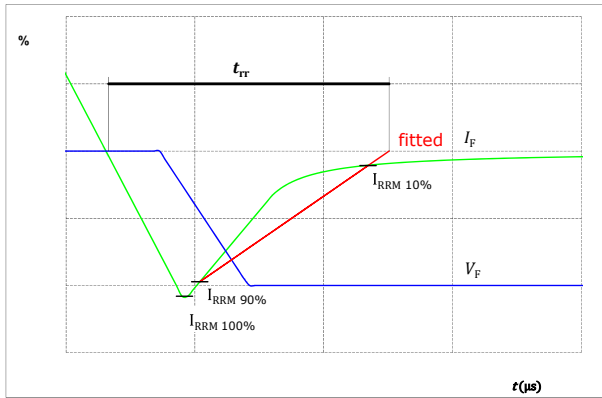
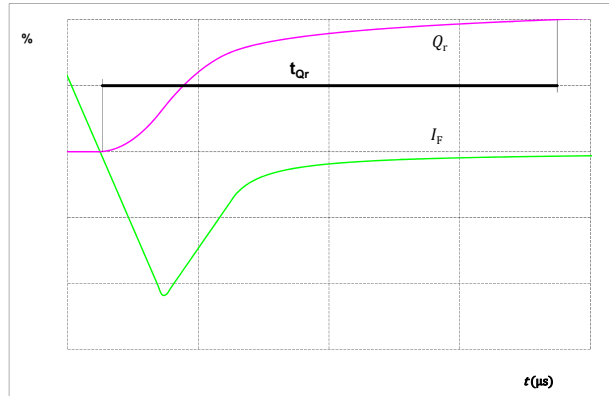
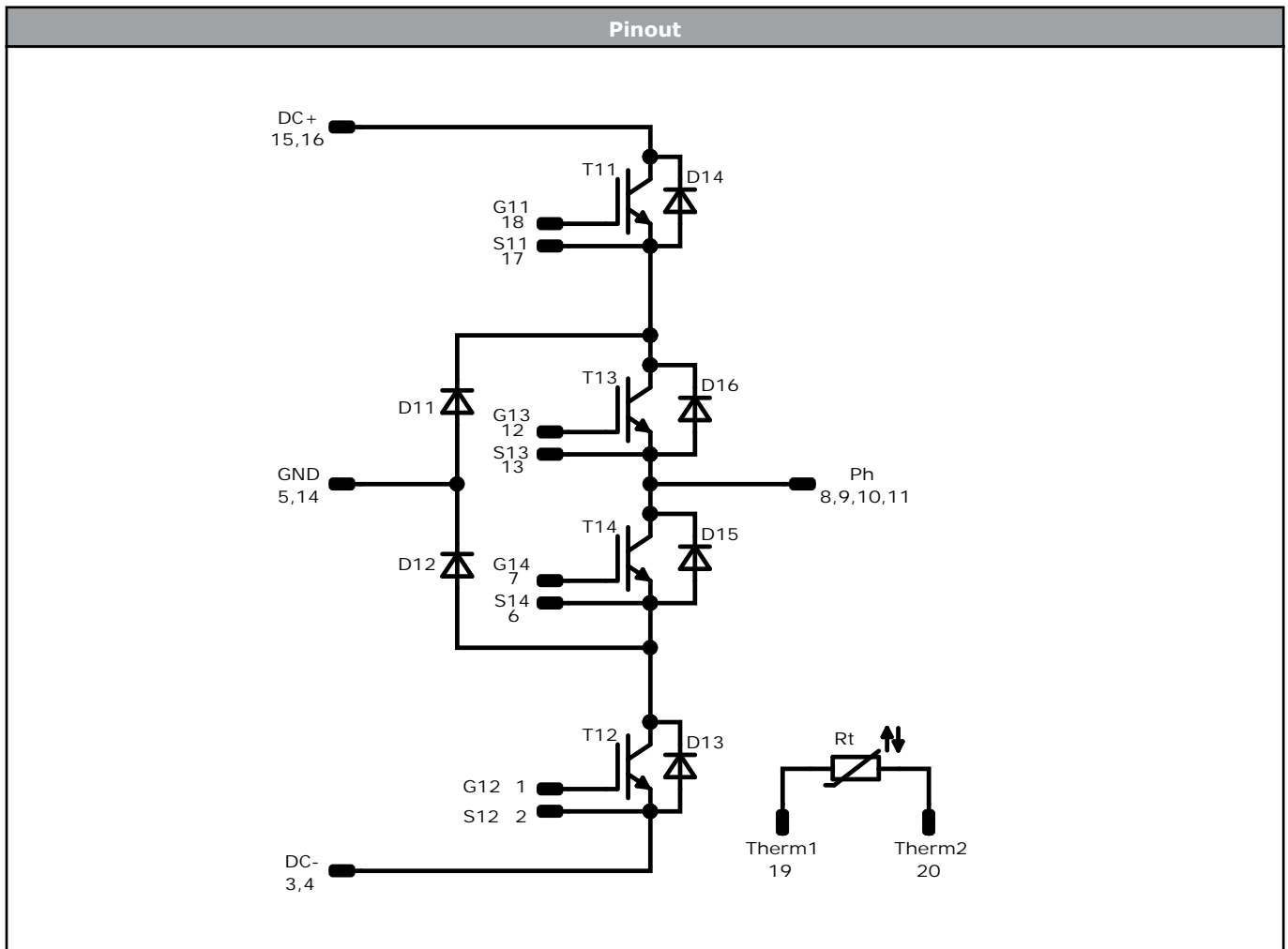


figure 53. FWD

Turn-on Switching Waveforms & definition of t_{Qr} (t_{Qr} = integrating time for Q_r)






Identification					
ID	Component	Voltage	Current	Function	Comment
T11, T12	IGBT	650 V	100 A	Buck Switch	
D11, D12	FWD	650 V	100 A	Buck Diode	
T13, T14	IGBT	650 V	75 A	Boost Switch	
D13, D14	FWD	650 V	50 A	Boost Diode	
D15, D16	FWD	650 V	50 A	Boost Sw. Inv. Diode	
Rt	NTC			Thermistor	



Packaging instruction				
Standard packaging quantity (SPQ) 135	>SPQ	Standard	<SPQ	Sample

Handling instruction
Handling instructions for <i>flow 0</i> packages see vincotech.com website.

Package data
Package data for <i>flow 0</i> packages see vincotech.com website.

UL recognition and file number
This device is certified according to UL 1557 standard, UL file number E192116. For more information see vincotech.com website. 

Document No.:	Date:	Modification:	Pages
10-PF07NIA100RG-P927F86T-D1-14	23 Apr. 2020		

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