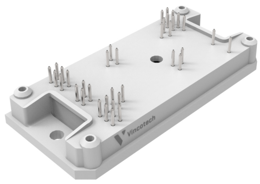
10-FY07NPA150SM01-L364F08
datasheet

***flow*NPC 1** **1200 V / 150 A**

Features

- NPC inverter topology
- Optimized for full rated bi-directional usage (4 quadrant)
- Optimized for 1200 Vdc applications
- High-speed IGBT in all switch positions
- Integrated NTC
- Low inductive design with integrated DC capacitor
- *flow* 1 12mm package

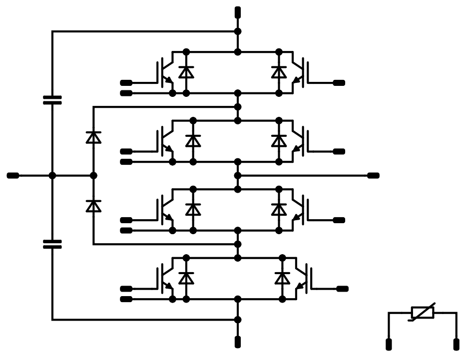
flow 1 12 mm housing



Target applications

- Energy Storage Systems
- Solar Inverters
- UPS

Schematic



Types

- 10-FY07NPA150SM01-L364F08

Maximum Ratings

T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Conditions		Value	Unit
Buck Switch					
Collector-emitter voltage	V_{CES}			650	V
Collector current (DC current)	I_C	$T_j = T_{jmax}$	T_s = 80 °C	83	A
Repetitive peak collector current	I_{CRM}	t_p limited by T_{jmax}		450	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$	T_s = 80 °C	128	W
Gate-emitter voltage	V_{GES}			±20	V
Maximum junction temperature	T_{jmax}			175	°C
Buck Diode					
Peak repetitive reverse voltage	V_{RRM}			650	V
Forward current (DC current)	I_F	$T_j = T_{jmax}$	T_s = 80 °C	68	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$	T_s = 80 °C	112	W
Maximum junction temperature	T_{jmax}			175	°C
Boost Switch					
Collector-emitter voltage	V_{CES}			650	V
Collector current (DC current)	I_C	$T_j = T_{jmax}$	T_s = 80 °C	162	A
Repetitive peak collector current	I_{CRM}	t_p limited by T_{jmax}		450	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$	T_s = 80 °C	179	W
Gate-emitter voltage	V_{GES}			±20	V
Maximum junction temperature	T_{jmax}			175	°C

Maximum Ratings

T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Conditions		Value	Unit
Boost Diode					
Peak repetitive reverse voltage	V_{RRM}			650	V
Forward current (DC current)	I_F	$T_j = T_{jmax}$	T_s = 80 °C	97	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 °C	133	W
Maximum junction temperature	T_{jmax}			175	°C
Boost Sw. Inv. Diode					
Peak repetitive reverse voltage	V_{RRM}			650	V
Forward current (DC current)	I_F	$T_j = T_{jmax}$	T_s = 80 °C	84	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 °C	122	W
Maximum junction temperature	T_{jmax}			175	°C
Capacitor (DC)					
Maximum DC voltage	V_{MAX}			630	V
Operation Temperature	T_{op}			-55 ... 125	°C

Module Properties

Parameter	Symbol	Conditions		Value	Unit
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 s	4000	V
Isolation voltage	V_{isol}	AC Voltage	t_p = 1 min	2500	V
Creepage distance				>12,7	mm
Clearance				8,07	mm
Comparative Tracking Index	CTI			≥ 200	

*100 % tested in production

Characteristic Values

Parameter	Symbol	Conditions	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	Unit
Buck Switch										
Static										
Gate-emitter threshold voltage	$V_{GE(th)}$	$V_{CE} = V_{GE}$			0,0015	25	3,3	4	4,7	V
Collector-emitter saturation voltage	V_{CEsat}		15		150	25 125 150		1,7 1,89 1,94	2,22[1]	V
Collector-emitter cut-off current	I_{CES}		0	650		25			80	µA
Gate-emitter leakage current	I_{GES}		20	0		25			240	nA
Internal gate resistance	r_g							None		Ω
Input capacitance	C_{ies}	f = 1 Mhz	0	25		25		8600		pF
Output capacitance	C_{oes}							150		pF
Reverse transfer capacitance	C_{res}							32		pF
Gate charge	Q_g	V_{CC} = 520 V	15		150	25		332		nC
Thermal										
Thermal resistance junction to sink [2]	$R_{th(j-s)}$	λ_{paste} = 3,4 W/mK (PSX)						0,74		K/W
Dynamic										
Turn-on delay time	$t_{d(on)}$	R_{gon} = 2 Ω R_{goff} = 2 Ω	-5/15	350	90	25 125 150		46,2 45,6 45,4		ns
Rise time	t_r					25 125 150		11,2 12,8 13,6		ns
Turn-off delay time	$t_{d(off)}$					25 125 150		129,6 147,2 152		ns
Fall time	t_f					25 125 150		6,79 7,26 7,38		ns
Turn-on energy (per pulse)	E_{on}	Q_{rFWD}=1,46 µC Q_{rFWD}=3,72 µC Q_{rFWD}=4,78 µC				25 125 150		0,562 0,931 1,05		mWs
Turn-off energy (per pulse)	E_{off}					25 125 150		0,361 0,641 0,732		mWs

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		2,5 2,2	2,6(1)	V
Reverse leakage current	I_R	V_r = 650 V				25			20	µA
Thermal										
Thermal resistance junction to sink (2)	$R_{th(j-s)}$	λ_{paste} = 3,4 W/mK (PSX)						0,85		K/W
Dynamic										
Peak recovery current	I_{RRM}	di/dt=7366 A/µs di/dt=6200 A/µs di/dt=6600 A/µs	-5/15	350	90	25 125 150		87,78 121,35 131,18		A
Reverse recovery time	t_{rr}					25 125 150		21,96 70,14 81,36		ns
Recovered charge	Q_r					25 125 150		1,46 3,72 4,78		µC
Reverse recovered energy	E_{rec}					25 125 150		0,274 0,796 1,05		mWs
Peak rate of fall of recovery current	$(di_{rf}/dt)_{max}$					25 125 150		14960 6659 6303		A/µs

Characteristic Values

Parameter	Symbol	Conditions	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	Unit
Boost Switch										
Static										
Gate-emitter threshold voltage	$V_{GE(th)}$	$V_{CE} = V_{GE}$			0,002	25	4,2	5	5,8	V
Collector-emitter saturation voltage	V_{CEsat}		15		150	25 125 150		1,1 1,09 1,08	1,45(1)	V
Collector-emitter cut-off current	I_{CES}		0	650		25			80	µA
Gate-emitter leakage current	I_{GES}		20	0		25			200	nA
Internal gate resistance	r_g							None		Ω
Input capacitance	C_{ies}	f = 1 Mhz	0	25		25		23250		pF
Reverse transfer capacitance	C_{res}	f = 1 Mhz	0	25		25		60		pF
Gate charge	Q_g		15	520	150	25		872		nC
Thermal										
Thermal resistance junction to sink (2)	$R_{th(j-s)}$	λ_{paste} = 3,4 W/mK (PSX)						0,53		K/W
Dynamic										
Turn-on delay time	$t_{d(on)}$	R_{gon} = 2 Ω R_{goff} = 2 Ω	-5/15	350	90	25 125 150		94,8 94,2 94		ns
Rise time	t_r	R_{gon} = 2 Ω R_{goff} = 2 Ω	-5/15	350	90	25 125 150		7,2 8,8 8,6		ns
Turn-off delay time	$t_{d(off)}$	R_{gon} = 2 Ω R_{goff} = 2 Ω	-5/15	350	90	25 125 150		356,2 396,6 411,6		ns
Fall time	t_f	R_{gon} = 2 Ω R_{goff} = 2 Ω	-5/15	350	90	25 125 150		73,73 73,35 64,94		ns
Turn-on energy (per pulse)	E_{on}	Q_{rFWD}=3,18 µC Q_{rFWD}=5,86 µC Q_{rFWD}=6,74 µC	-5/15	350	90	25 125 150		0,45 0,682 0,849		mWs
Turn-off energy (per pulse)	E_{off}		-5/15	350	90	25 125 150		4,43 6,68 7,03		mWs

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				100	25 125 150		1,5 1,43 1,4	1,92(1)	V
Reverse leakage current	I_R	V_r = 650 V				25			5,3	µA
Thermal										
Thermal resistance junction to sink (2)	$R_{th(j-s)}$	λ_{paste} = 3,4 W/mK (PSX)						0,71		K/W
Dynamic										
Peak recovery current	I_{RRM}	d*i*/d*t*=8581 A/µs d*i*/d*t*=8320 A/µs d*i*/d*t*=7500 A/µs	-5/15	350	90	25 125 150		102,76 129,88 136,52		A
Reverse recovery time	t_{rr}					25 125 150		50,84 86,12 93,94		ns
Recovered charge	Q_r					25 125 150		3,18 5,86 6,74		µC
Reverse recovered energy	E_{rec}					25 125 150		0,763 1,45 1,63		mWs
Peak rate of fall of recovery current	$(di_{rf}/dt)_{max}$					25 125 150		2631 2254 2303		A/µs

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 Sw. Inv. Diode										
Static										
Forward voltage	V_F				100	25 150	1,18	1,78 1,57	1,82(1)	V
Reverse leakage current	I_R	V_r = 650 V				25			1,2	µA
Thermal										
Thermal resistance junction to sink (2)	$R_{th(j-s)}$	λ_{paste} = 3,4 W/mK (PSX)						0,78		K/W
Capacitor (DC)										
Static										
Capacitance	C	DC bias voltage = 0 V				25		200		nF
Tolerance							-10		10	%
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	

(1) Value at chip level

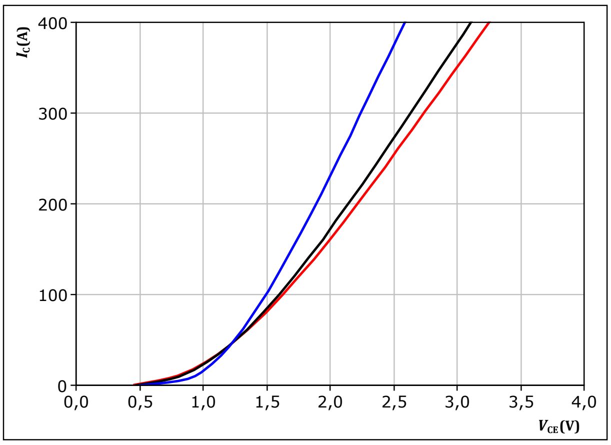
(2) Only valid with pre-applied Vincotech thermal interface material.

Buck Switch Characteristics

figure 1. IGBT

Typical output characteristics

$I_C = f(V_{CE})$



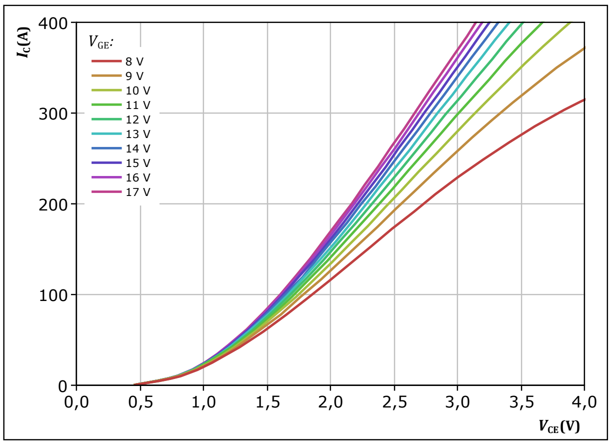
t_p =	250	µs
V_{GE} =	15	V

T_j: 25 °C, 125 °C, 150 °C

figure 2. IGBT

Typical output characteristics

$I_C = f(V_{CE})$



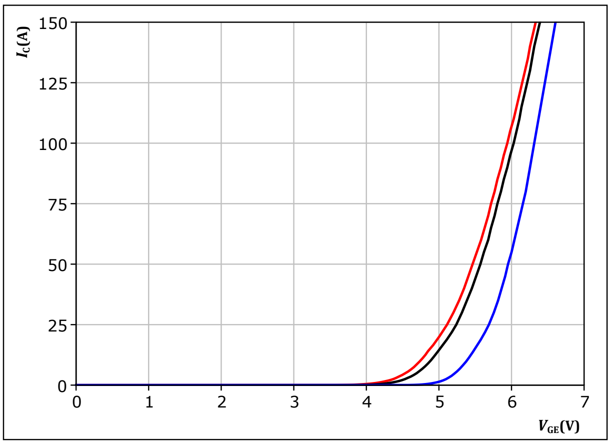
t_p =	250	µs
T_j =	150	°C

V_{GE} from 8 V to 17 V in steps of 1 V

figure 3. IGBT

Typical transfer characteristics

$I_C = f(V_{GE})$



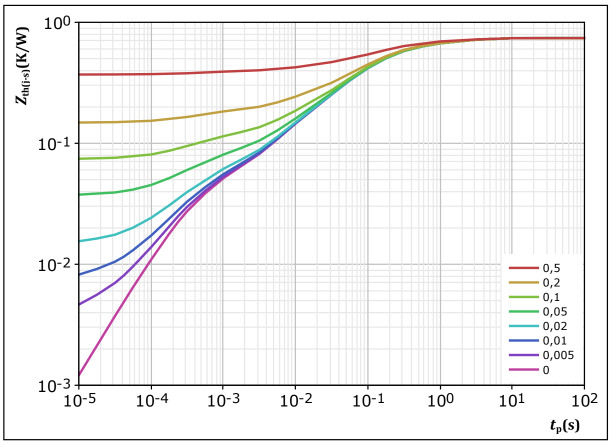
t_p =	250	µs
V_{CE} =	10	V

T_j: 25 °C, 125 °C, 150 °C

figure 4. IGBT

Transient thermal impedance as a function of pulse width

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



D =	t_p / T	
$R_{th(j-s)}$ =	0,74	K/W

IGBT thermal model values

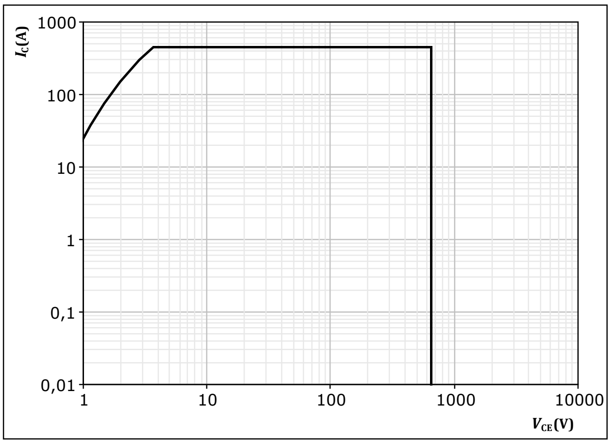
R (K/W)	τ (s)
1,09E-01	1,94E+00
2,21E-01	2,60E-01
2,87E-01	6,98E-02
8,43E-02	8,29E-03
3,94E-02	3,67E-04

Buck Switch Characteristics

figure 5.	IGBT

Safe operating area

I_C = f(V_{CE})



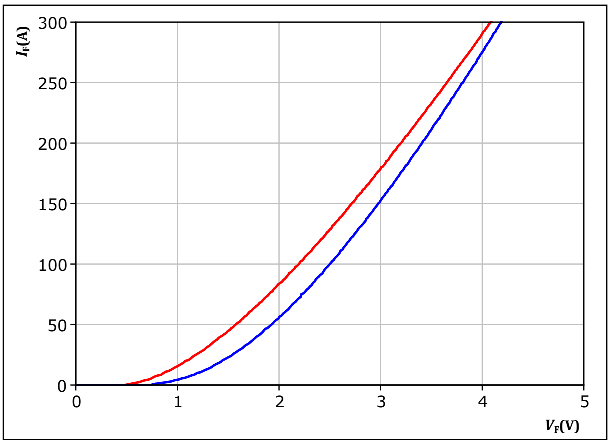
D =	single pulse	
T_s =	80	°C
V_{GE} =	15	V
T_j =	T_{jmax}	

Buck Diode Characteristics

figure 6. **FWD**

Typical forward characteristics

I_F = f(V_F)



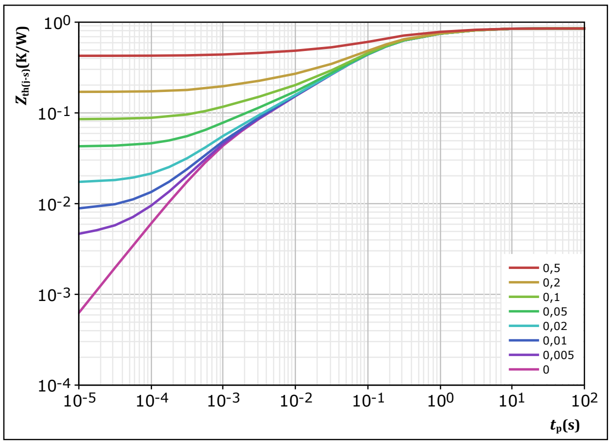
t_p = 250 µs

T_j: 25 °C, 125 °C

figure 7. **FWD**

Transient thermal impedance as a function of pulse width

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



D = t_p / T

$R_{th(j-s)}$ = 0,852 K/W

FWD thermal model values

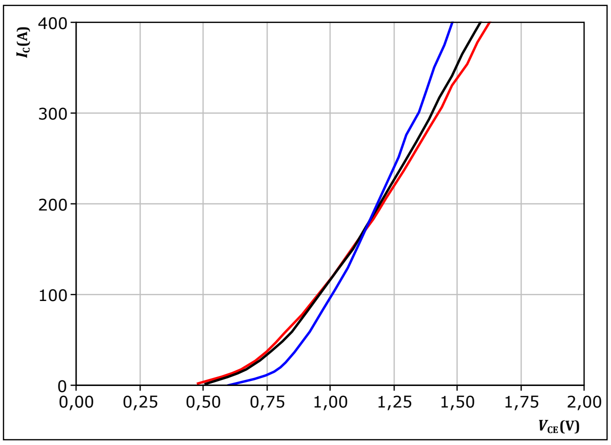
R (K/W)	τ (s)
9,18E-02	3,34E+00
1,92E-01	6,05E-01
3,65E-01	1,19E-01
1,13E-01	2,58E-02
5,25E-02	4,68E-03
3,80E-02	8,67E-04

Boost Switch Characteristics

figure 8. **IGBT**

Typical output characteristics

I_C = f(V_{CE})



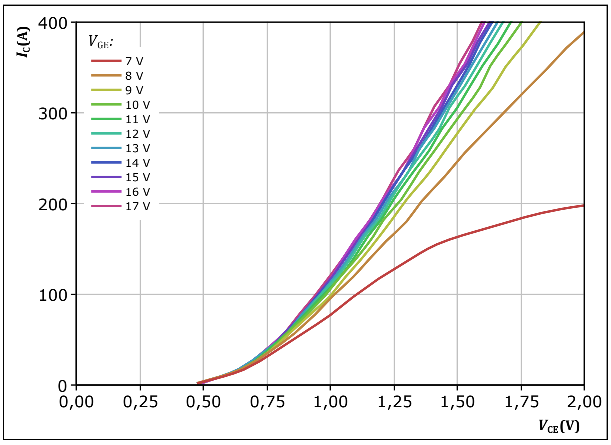
t_p =	250	μs
V_{GE} =	15	V

T_j: 25 °C, 125 °C, 150 °C

figure 9. **IGBT**

Typical output characteristics

I_C = f(V_{CE})



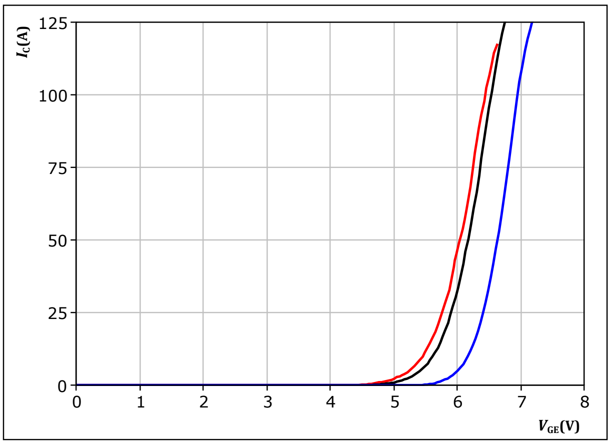
t_p =	250	μs
T_j =	150	°C

V_{GE} from 7 V to 17 V in steps of 1 V

figure 10. **IGBT**

Typical transfer characteristics

I_C = f(V_{GE})



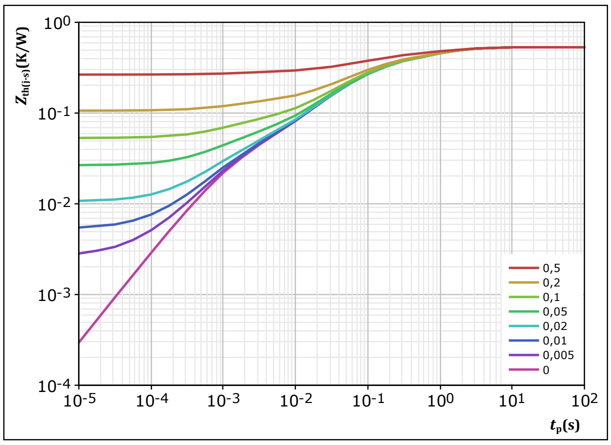
t_p =	250	μs
V_{CE} =	10	V

T_j: 25 °C, 125 °C, 150 °C

figure 11. **IGBT**

Transient thermal impedance as a function of pulse width

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



D =	t_p / T	
$R_{th(j-s)}$ =	0,531	K/W

IGBT thermal model values

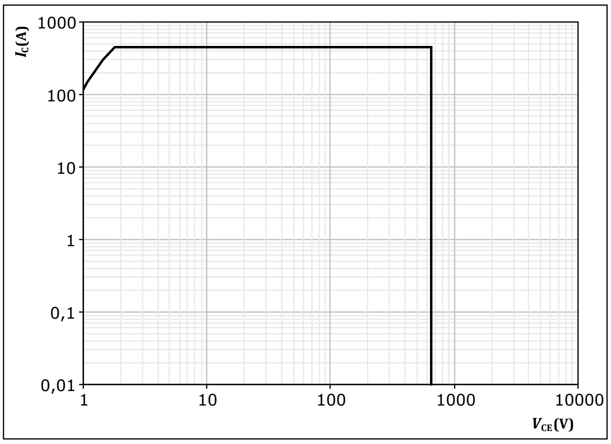
R (K/W)	τ (s)
1,45E-01	1,46E+00
1,58E-01	2,17E-01
1,60E-01	5,54E-02
4,03E-02	1,46E-02
2,74E-02	1,18E-03

Boost Switch Characteristics

figure 12.	IGBT

Safe operating area

$I_C = f(V_{CE})$



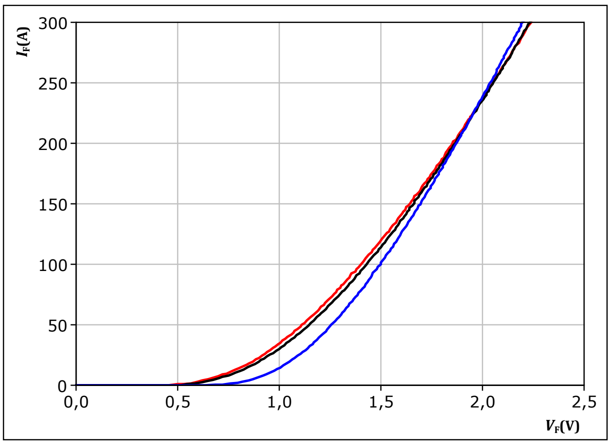
D =	single pulse	
T_s =	80	°C
V_{GE} =	15	V
T_j =	T_{jmax}	

Boost Diode Characteristics

figure 13. FWD

Typical forward characteristics

$I_F = f(V_F)$



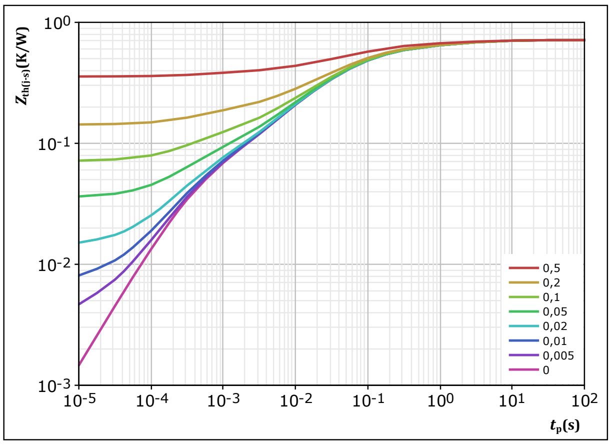
t_p = 250 µs

T_j: 25 °C, 125 °C, 150 °C

figure 14. FWD

Transient thermal impedance as a function of pulse width

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



$D = t_p / T$

$R_{th(j-s)}$ = 0,713 K/W

FWD thermal model values

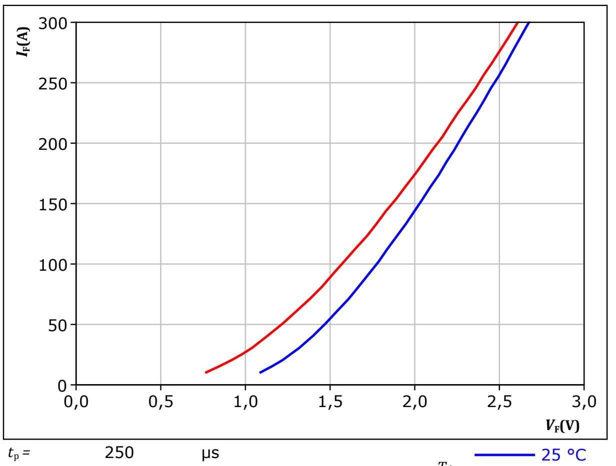
R (K/W)	τ (s)
3,89E-02	5,80E+00
7,15E-02	1,25E+00
1,49E-01	1,96E-01
2,38E-01	5,23E-02
1,36E-01	1,12E-02
3,72E-02	2,44E-03
4,26E-02	3,69E-04

Boost Sw. Inv. Diode Characteristics

figure 15. **FWD**

Typical forward characteristics

I_F = f(V_F)



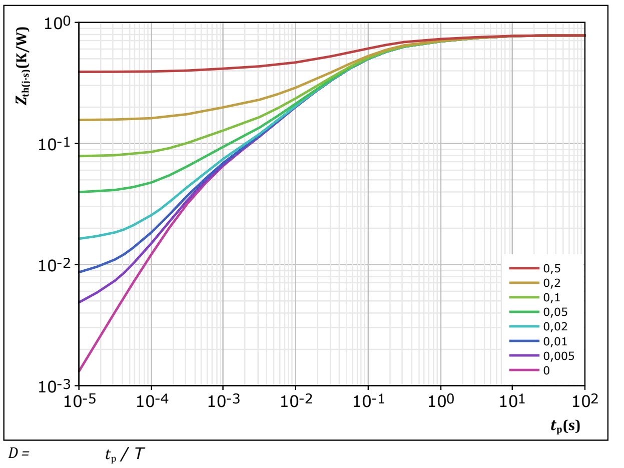
t_p = 250 µs

T_j: 25 °C, 150 °C

figure 16. **FWD**

Transient thermal impedance as a function of pulse width

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



D = t_p / T

$R_{th(j-s)}$ = 0,78 K/W

FWD thermal model values

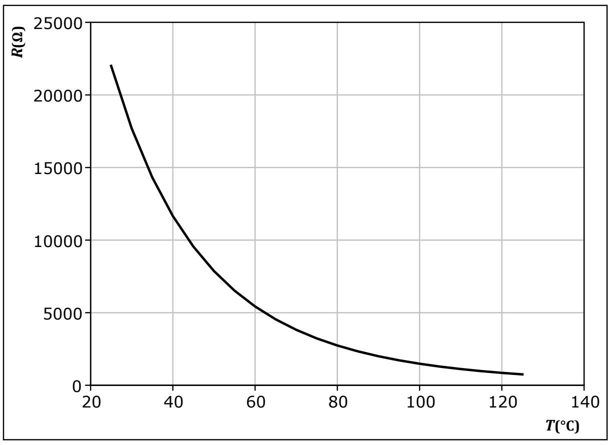
R (K/W)	τ (s)
5,76E-02	5,42E+00
8,79E-02	1,09E+00
2,14E-01	1,59E-01
2,31E-01	4,95E-02
1,16E-01	1,05E-02
3,20E-02	2,39E-03
4,19E-02	4,10E-04

Thermistor Characteristics

figure 17.	Thermistor

Typical NTC characteristic as function of temperature

$R_T = f(T)$

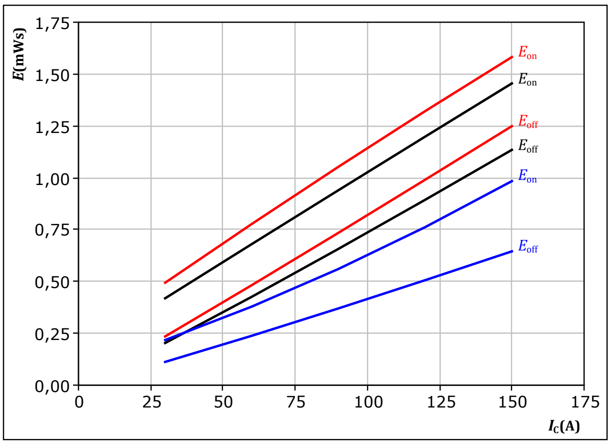


Buck Switching Characteristics

figure 18. **IGBT**

Typical switching energy losses as a function of collector current

E = f(I_C)



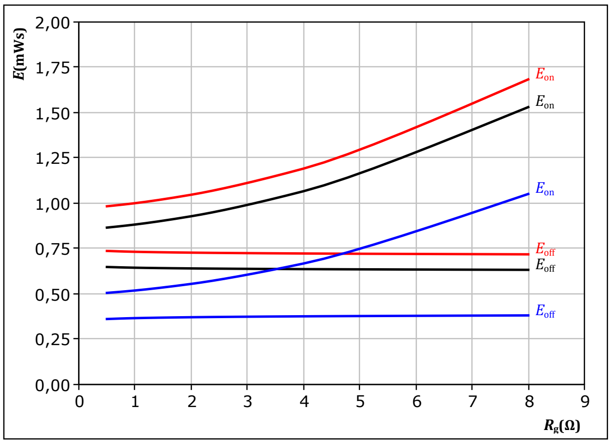
With an inductive load at

V_{CE} =	350	V	T_j:	25 °C
V_{GE} =	-5/15	V		125 °C
R_{gon} =	2	Ω		150 °C
R_{goff} =	2	Ω		

figure 19. **IGBT**

Typical switching energy losses as a function of gate resistor

E = f(R_g)



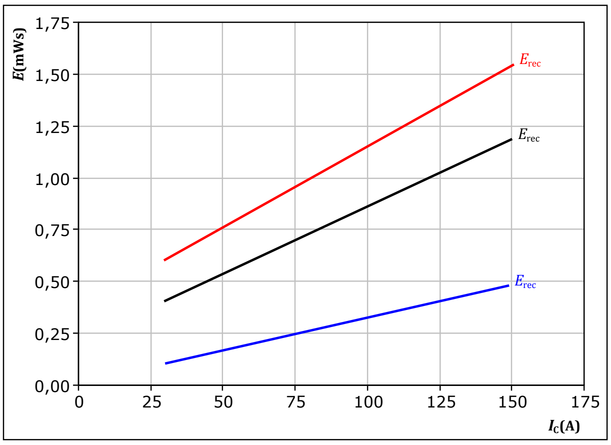
With an inductive load at

V_{CE} =	350	V	T_j:	25 °C
V_{GE} =	-5/15	V		125 °C
I_C =	90	A		150 °C

figure 20. **FWD**

Typical reverse recovered energy loss as a function of collector current

E_{rec} = f(I_C)



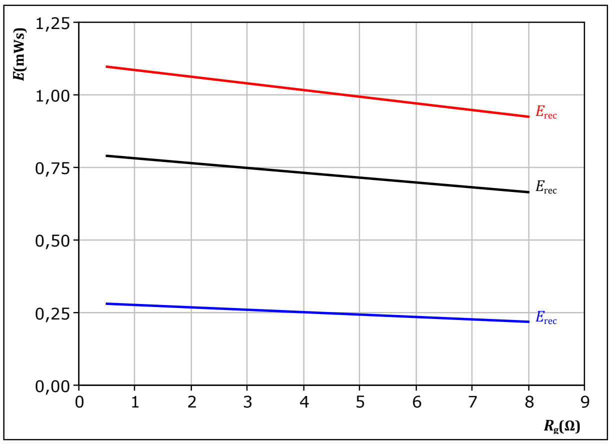
With an inductive load at

V_{CE} =	350	V	T_j:	25 °C
V_{GE} =	-5/15	V		125 °C
R_{gon} =	2	Ω		150 °C

figure 21. **FWD**

Typical reverse recovered energy loss as a function of gate resistor

E_{rec} = f(R_g)



With an inductive load at

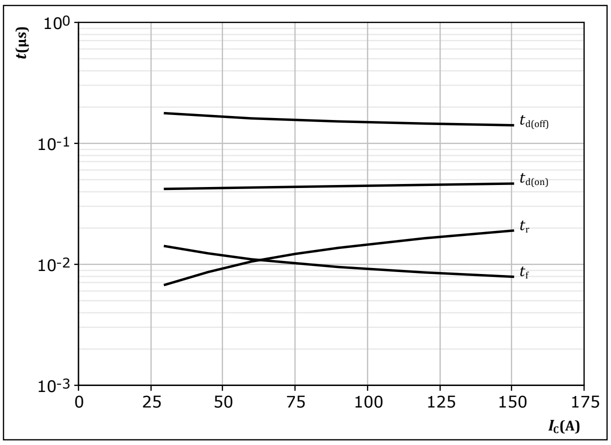
V_{CE} =	350	V	T_j:	25 °C
V_{GE} =	-5/15	V		125 °C
I_C =	90	A		150 °C

Buck Switching Characteristics

figure 22. **IGBT**

Typical switching times as a function of collector current

$t = f(I_C)$



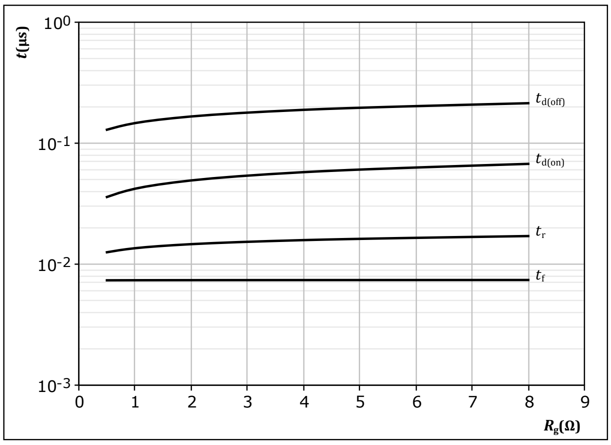
With an inductive load at

T_j =	150	°C
V_{CE} =	350	V
V_{GE} =	-5/15	V
R_{gon} =	2	Ω
R_{goff} =	2	Ω

figure 23. **IGBT**

Typical switching times as a function of gate resistor

$t = f(R_g)$



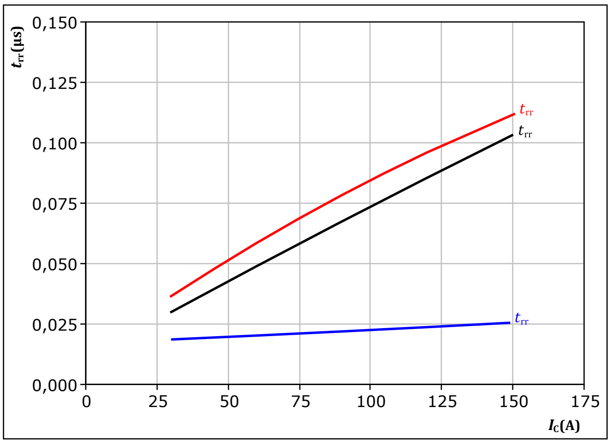
With an inductive load at

T_j =	150	°C
V_{CE} =	350	V
V_{GE} =	-5/15	V
I_C =	90	A

figure 24. **FWD**

Typical reverse recovery time as a function of collector current

$t_{rr} = f(I_C)$



With an inductive load at

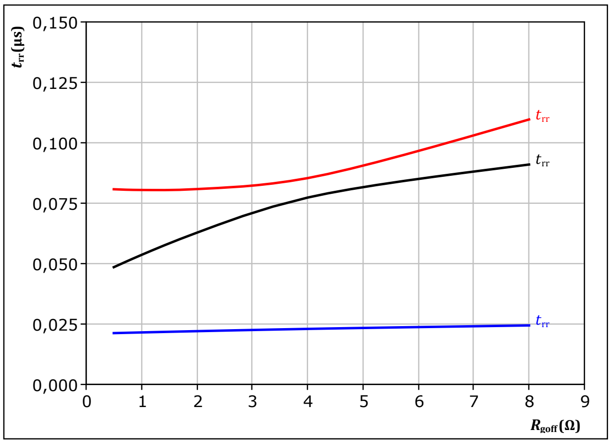
V_{CE} =	350	V
V_{GE} =	-5/15	V
R_{gon} =	2	Ω

T_j: 25 °C, 125 °C, 150 °C

figure 25. **FWD**

Typical reverse recovery time as a function of IGBT turn off gate resistor

$t_{rr} = f(R_{goff})$



With an inductive load at

V_{CE} =	350	V
V_{GE} =	-5/15	V
I_C =	90	A

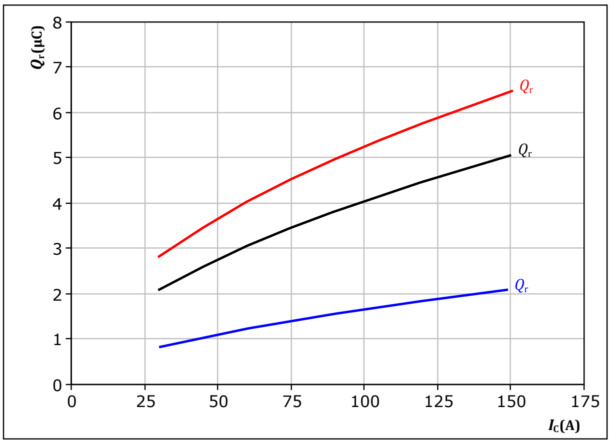
T_j: 25 °C, 125 °C, 150 °C

Buck Switching Characteristics

figure 26. FWD

Typical recovered charge as a function of collector current

Q_r = f(I_C)



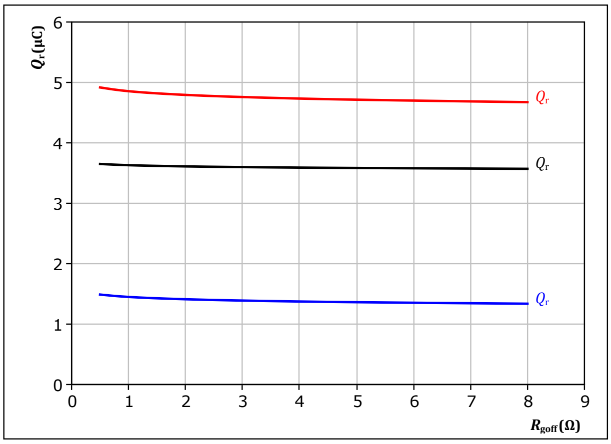
With an inductive load at

V_{CE} =	350	V	T_j:	25 °C
V_{GE} =	-5/15	V		125 °C
R_{gon} =	2	Ω		150 °C

figure 27. FWD

Typical recovered charge as a function of turn off gate resistor

Q_r = f(R_{goff})



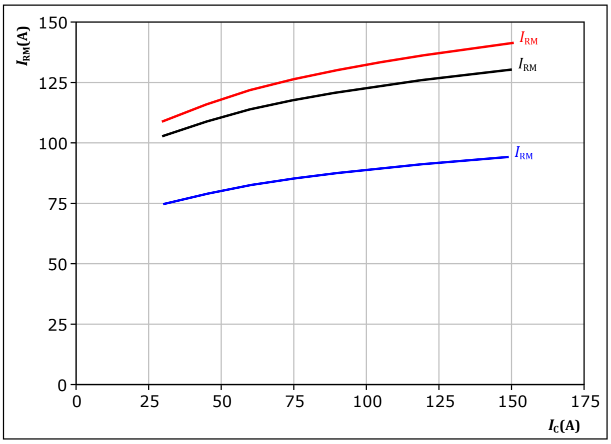
With an inductive load at

V_{CE} =	350	V	T_j:	25 °C
V_{GE} =	-5/15	V		125 °C
I_C =	90	A		150 °C

figure 28. FWD

Typical peak reverse recovery current as a function of collector current

I_{RM} = f(I_C)



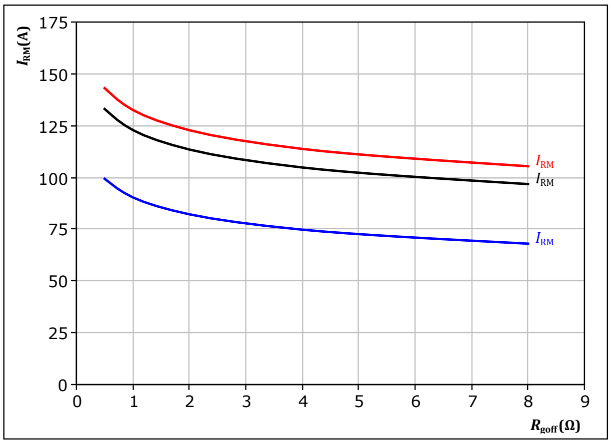
With an inductive load at

V_{CE} =	350	V	T_j:	25 °C
V_{GE} =	-5/15	V		125 °C
R_{gon} =	2	Ω		150 °C

figure 29. FWD

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

I_{RM} = f(R_{goff})



With an inductive load at

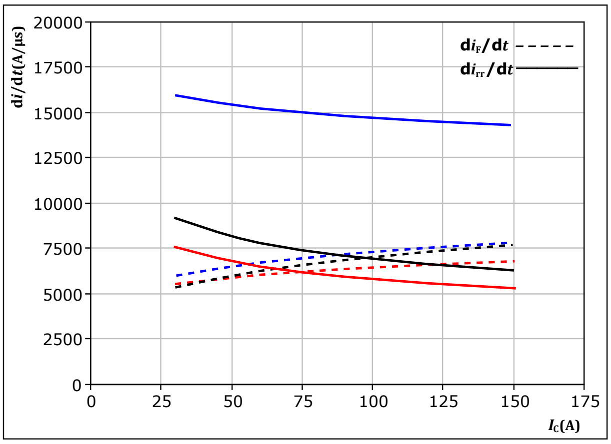
V_{CE} =	350	V	T_j:	25 °C
V_{GE} =	-5/15	V		125 °C
I_C =	90	A		150 °C

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)



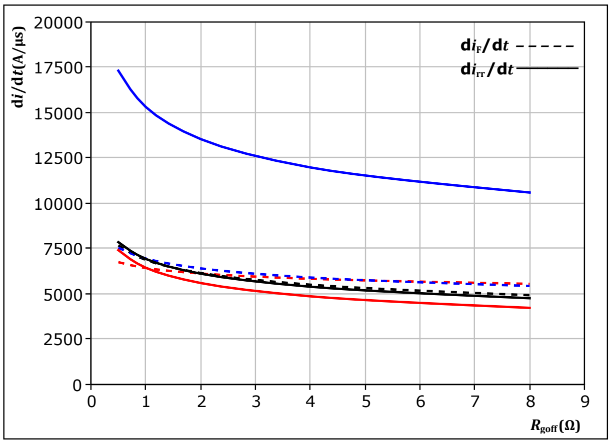
With an inductive load at

V_{CE} =	350	V	T_j:	25 °C
V_{GE} =	-5/15	V		125 °C
R_{gon} =	2	Ω		150 °C

figure 31. **FWD**

Typical rate of fall of forward and reverse recovery current as a function of turn off gate resistor

di_F/dt, di_{rr}/dt = f(R_{goff})



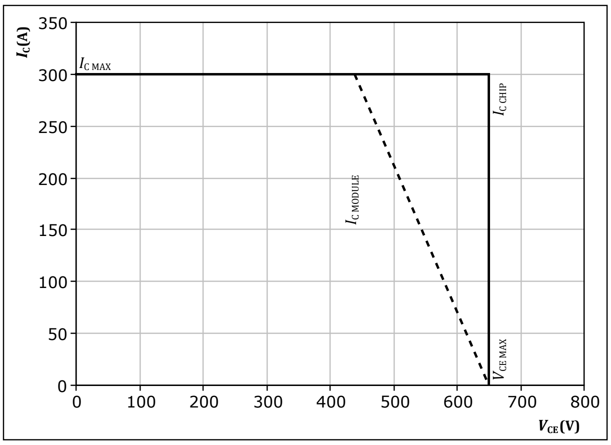
With an inductive load at

V_{CE} =	350	V	T_j:	25 °C
V_{GE} =	-5/15	V		125 °C
I_C =	90	A		150 °C

figure 32. **IGBT**

Reverse bias safe operating area

I_C = f(V_{CE})



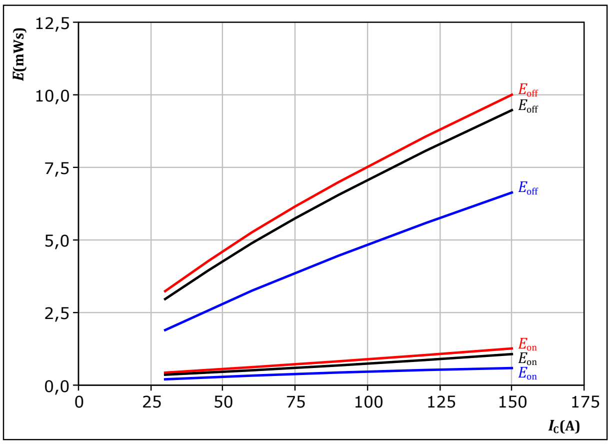
At	T_j =	150	°C
	R_{gon} =	2	Ω
	R_{goff} =	2	Ω

Boost Switching Characteristics

figure 33. **IGBT**

Typical switching energy losses as a function of collector current

$E = f(I_C)$



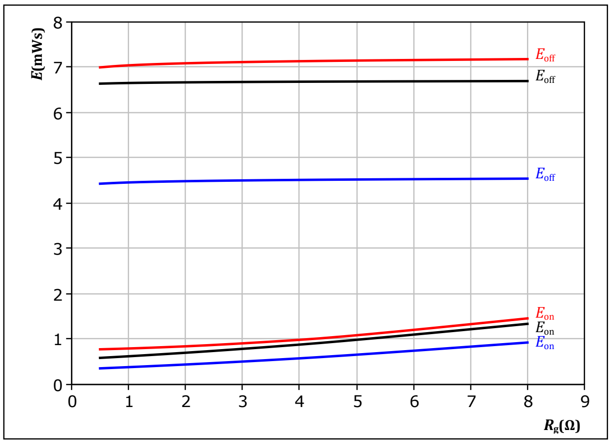
With an inductive load at

V_{CE} =	350	V	T_j:	25 °C
V_{GE} =	-5/15	V		125 °C
R_{gon} =	2	Ω		150 °C
R_{goff} =	2	Ω		

figure 34. **IGBT**

Typical switching energy losses as a function of gate resistor

$E = f(R_g)$



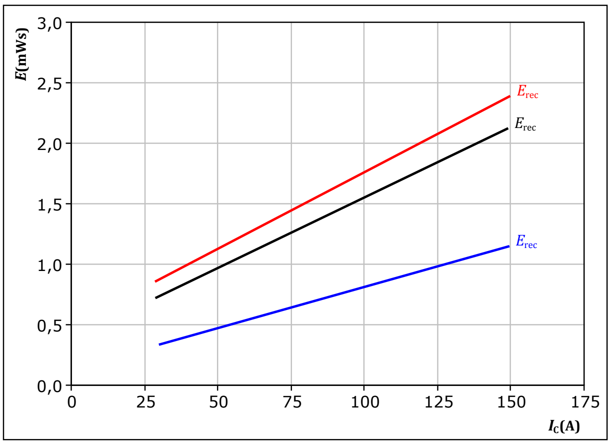
With an inductive load at

V_{CE} =	350	V	T_j:	25 °C
V_{GE} =	-5/15	V		125 °C
I_C =	90	A		150 °C

figure 35. **FWD**

Typical reverse recovered energy loss as a function of collector current

$E_{rec} = f(I_C)$



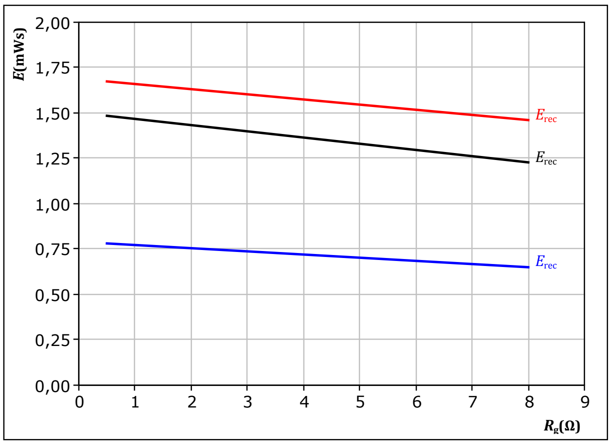
With an inductive load at

V_{CE} =	350	V	T_j:	25 °C
V_{GE} =	-5/15	V		125 °C
R_{gon} =	2	Ω		150 °C

figure 36. **FWD**

Typical reverse recovered energy loss as a function of gate resistor

$E_{rec} = f(R_g)$



With an inductive load at

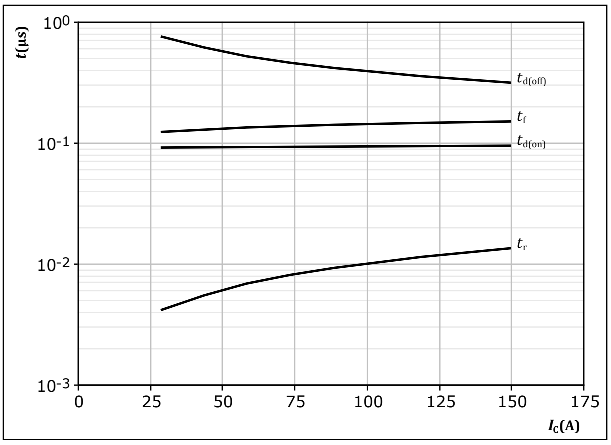
V_{CE} =	350	V	T_j:	25 °C
V_{GE} =	-5/15	V		125 °C
I_C =	90	A		150 °C

Boost Switching Characteristics

figure 37. **IGBT**

Typical switching times as a function of collector current

t = f(I_C)



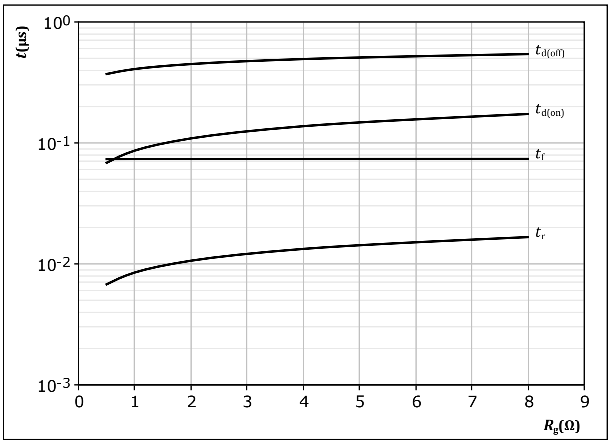
With an inductive load at

T_j =	150	°C
V_{CE} =	350	V
V_{GE} =	-5/15	V
R_{gon} =	2	Ω
R_{goff} =	2	Ω

figure 38. **IGBT**

Typical switching times as a function of gate resistor

t = f(R_g)



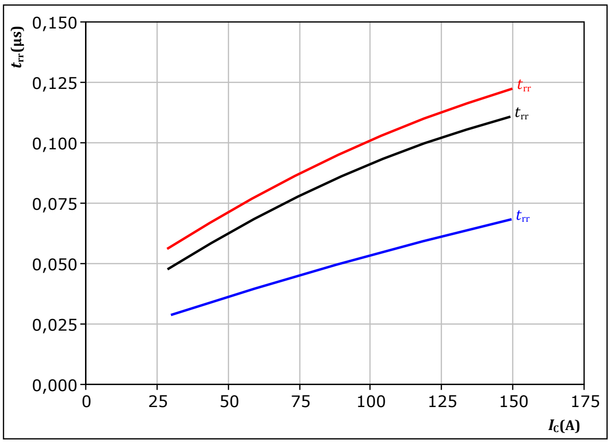
With an inductive load at

T_j =	150	°C
V_{CE} =	350	V
V_{GE} =	-5/15	V
I_C =	90	A

figure 39. **FWD**

Typical reverse recovery time as a function of collector current

t_{rr} = f(I_C)



With an inductive load at

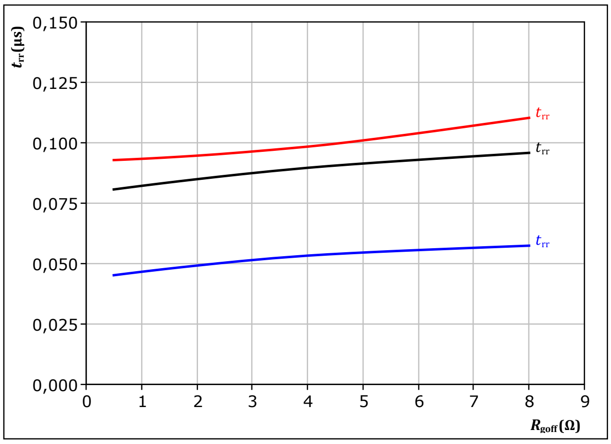
V_{CE} =	350	V
V_{GE} =	-5/15	V
R_{gon} =	2	Ω

T_j: 25 °C, 125 °C, 150 °C

figure 40. **FWD**

Typical reverse recovery time as a function of IGBT turn off gate resistor

t_{rr} = f(R_{goff})



With an inductive load at

V_{CE} =	350	V
V_{GE} =	-5/15	V
I_C =	90	A

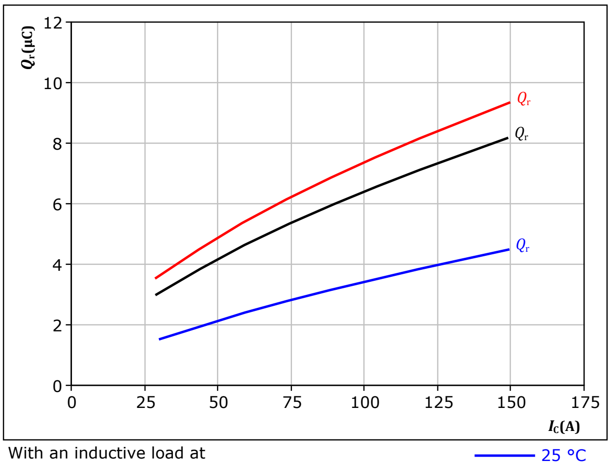
T_j: 25 °C, 125 °C, 150 °C

Boost Switching Characteristics

figure 41. **FWD**

Typical recovered charge as a function of collector current

$Q_r = f(I_C)$



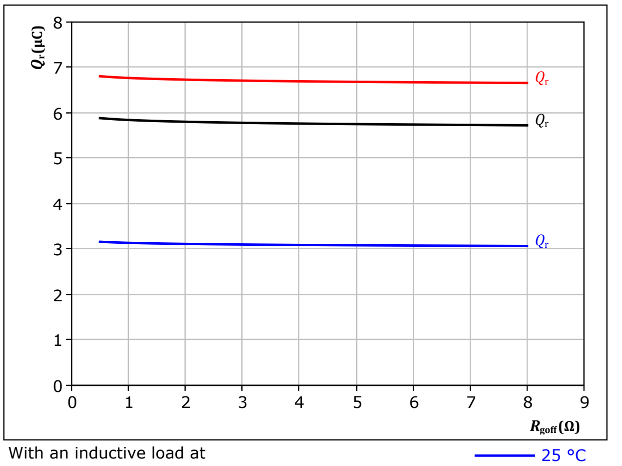
With an inductive load at

V_{CE} =	350	V	T_j:	25 °C
V_{GE} =	-5/15	V		125 °C
R_{gon} =	2	Ω		150 °C

figure 42. **FWD**

Typical recovered charge as a function of turn off gate resistor

$Q_r = f(R_{goff})$



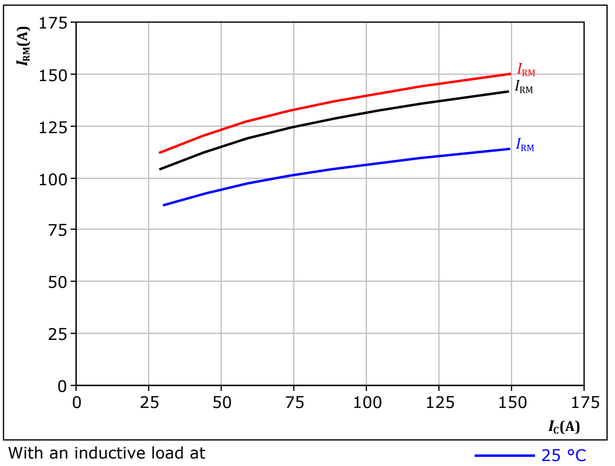
With an inductive load at

V_{CE} =	350	V	T_j:	25 °C
V_{GE} =	-5/15	V		125 °C
I_C =	90	A		150 °C

figure 43. **FWD**

Typical peak reverse recovery current as a function of collector current

$I_{RM} = f(I_C)$



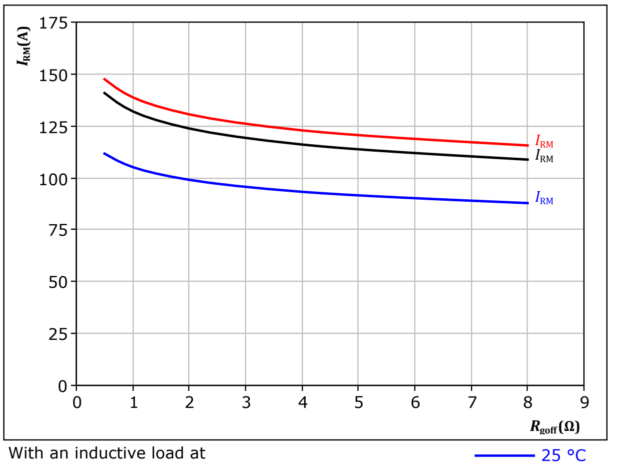
With an inductive load at

V_{CE} =	350	V	T_j:	25 °C
V_{GE} =	-5/15	V		125 °C
R_{gon} =	2	Ω		150 °C

figure 44. **FWD**

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

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



With an inductive load at

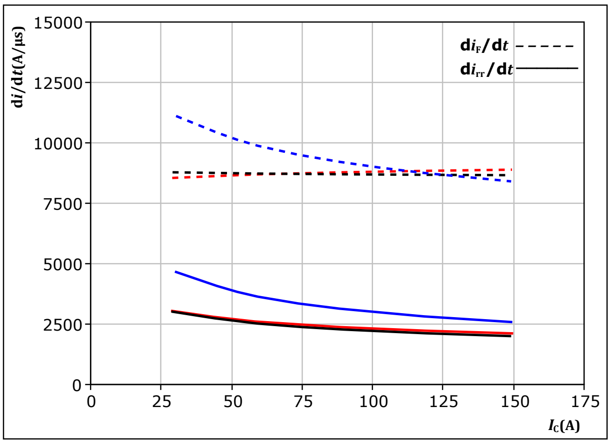
V_{CE} =	350	V	T_j:	25 °C
V_{GE} =	-5/15	V		125 °C
I_C =	90	A		150 °C

Boost Switching Characteristics

figure 45. **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)



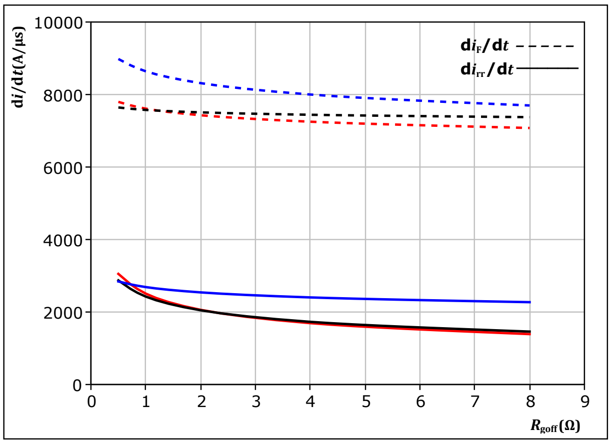
With an inductive load at

V_{CE} =	350	V	T_j:	25 °C
V_{GE} =	-5/15	V		125 °C
R_{gon} =	2	Ω		150 °C

figure 46. **FWD**

Typical rate of fall of forward and reverse recovery current as a function of turn off gate resistor

di_F/dt, di_{rr}/dt = f(R_{goff})



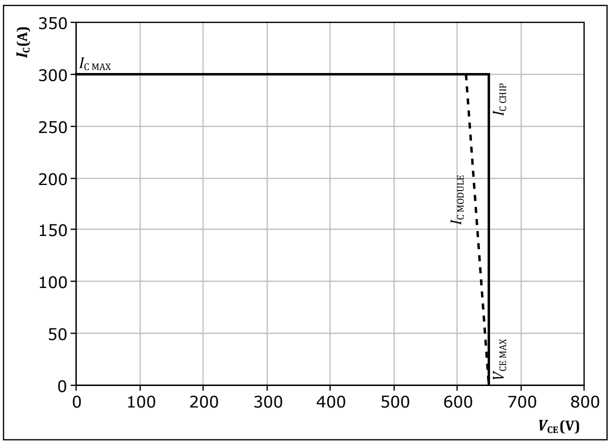
With an inductive load at

V_{CE} =	350	V	T_j:	25 °C
V_{GE} =	-5/15	V		125 °C
I_C =	90	A		150 °C

figure 47. **IGBT**

Reverse bias safe operating area

I_C = f(V_{CE})



At	T_j =	150	°C
	R_{gon} =	2	Ω
	R_{goff} =	2	Ω

Switching Definitions

figure 48. **IGBT**

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

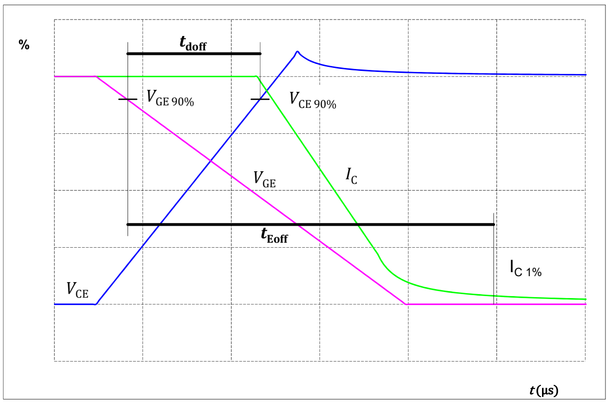


figure 49. **IGBT**

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

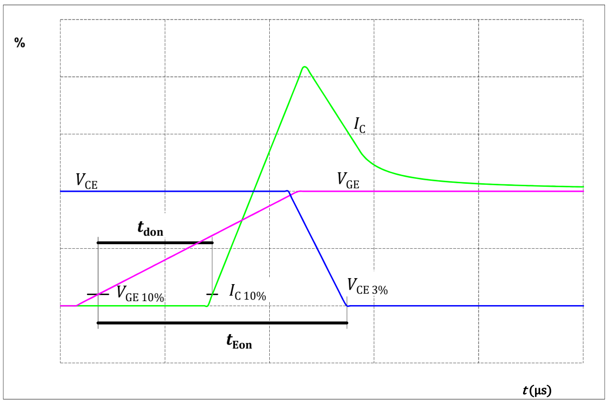


figure 50. **IGBT**

Turn-off Switching Waveforms & definition of t_f

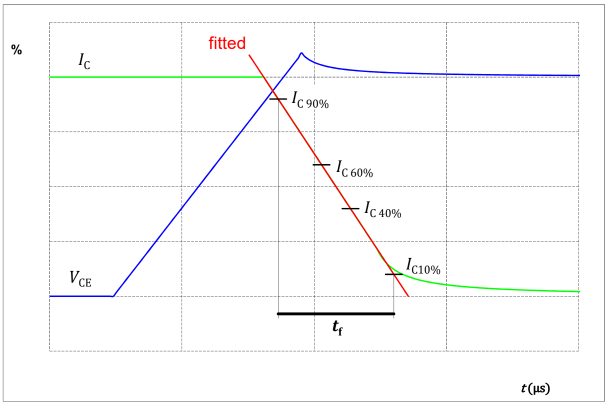
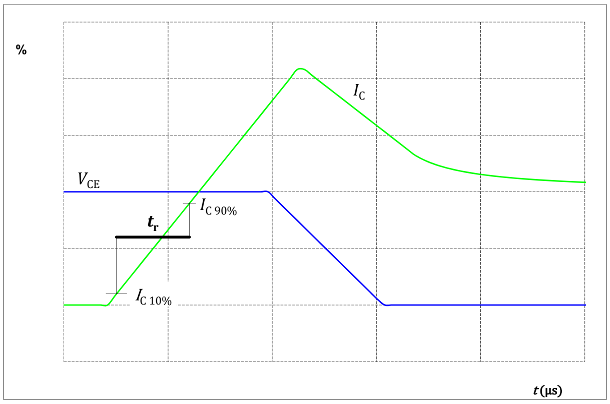


figure 51. **IGBT**

Turn-on Switching Waveforms & definition of t_r



Switching Definitions

figure 52. **FWD**

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

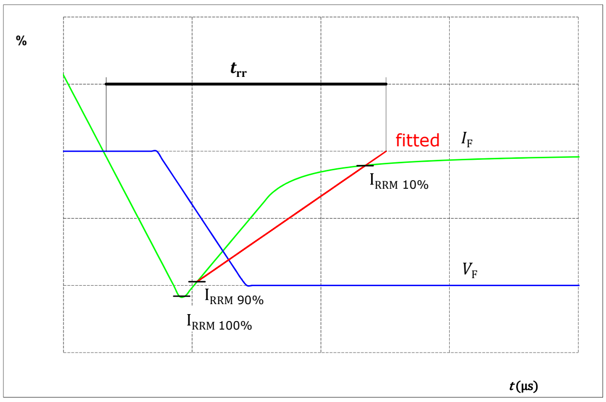
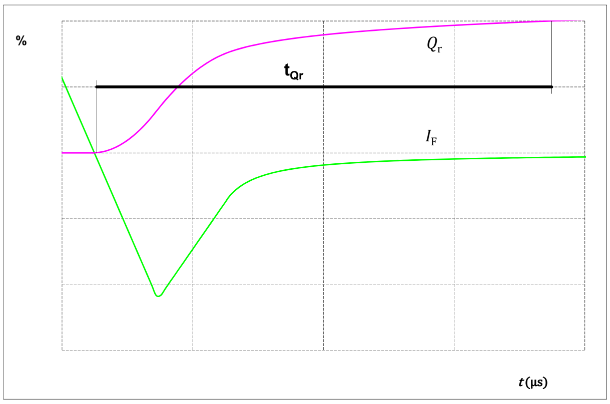


figure 53. **FWD**

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



Ordering Code

Version	Ordering Code
Without thermal paste	10-FY07NPA150SM01-L364F08
With thermal paste (5,2 W/mK, PTM6000HV)	10-FY07NPA150SM01-L364F08-/7/
With thermal paste (3,4 W/mK, PSX-P7)	10-FY07NPA150SM01-L364F08-/3/

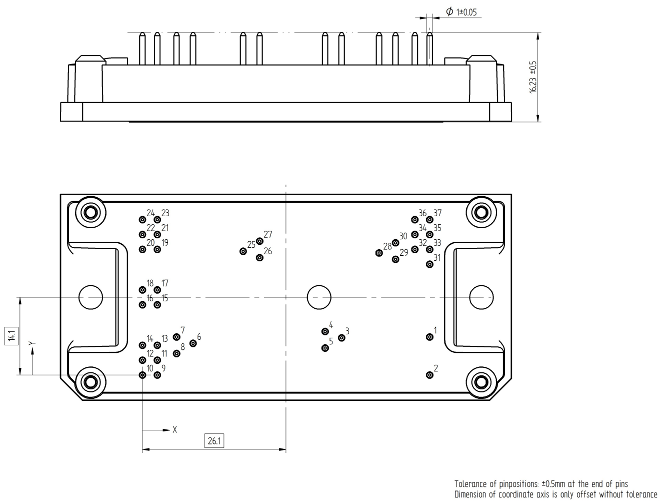
Marking

	Name		Date code	UL & VIN	Lot	Serial
Text	NN-NNNNNNNNNNNNNN-TTTTTTVV		WWYY	UL VIN	LLLLL	SSSS
Datamatrix	Type&Ver	Lot number	Serial	Date code		
	TTTTTTTVV	LLLLL	SSSS	WWYY		

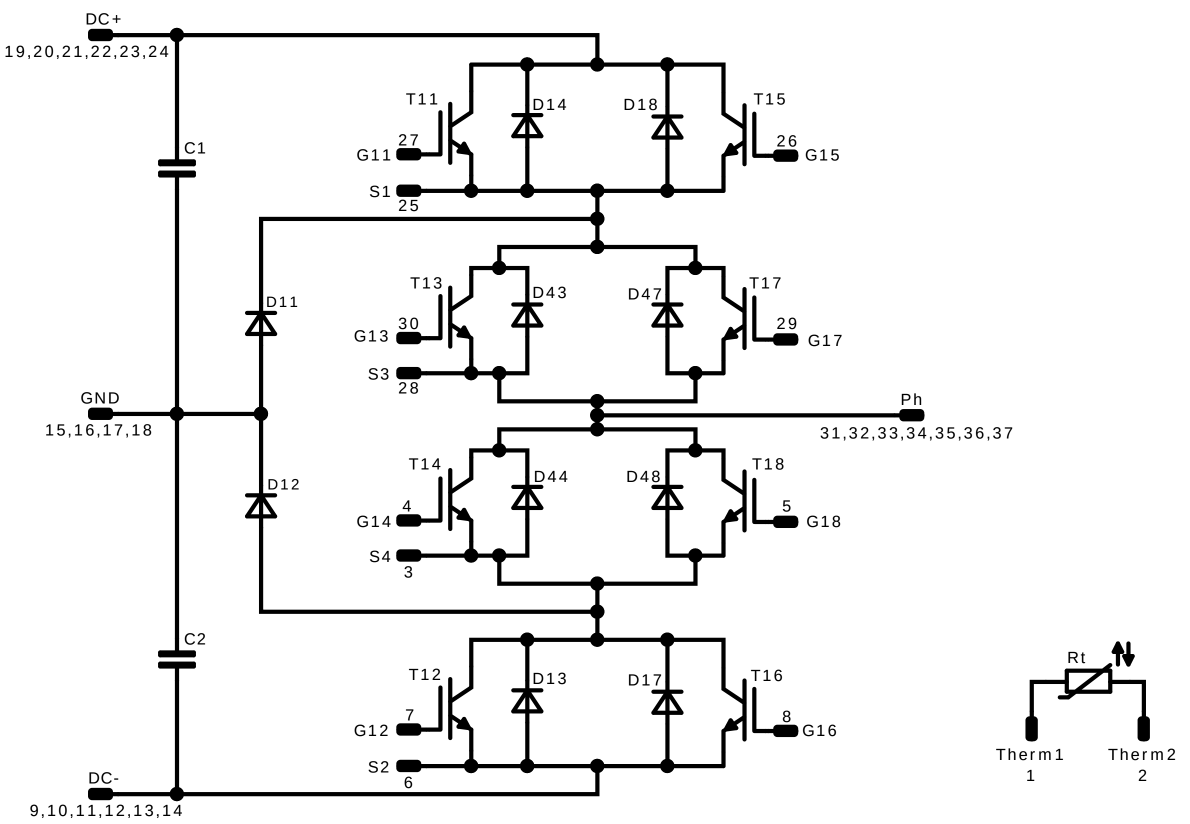
Outline

Pin table [mm]

Pin	X	Y	Function
1	52,2	6,9	Therm1
2	52,2	0	Therm2
3	36,2	6,75	S4
4	33,2	7,9	G14
5	33,2	4,9	G18
6	9,2	5,75	S2
7	6,2	6,9	G12
8	6,2	3,9	G16
9	2,7	0	DC-
10	0	0	DC-
11	2,7	2,7	DC-
12	0	2,7	DC-
13	2,7	5,4	DC-
14	0	5,4	DC-
15	2,7	12,75	GND
16	0	12,75	GND
17	2,7	15,45	GND
18	0	15,45	GND
19	2,7	22,8	DC+
20	0	22,8	DC+
21	2,7	25,5	DC+
22	0	25,5	DC+
23	2,7	28,2	DC+
24	0	28,2	DC+
25	18,3	22,45	S1
26	21,3	21,3	G15
27	21,3	24,3	G11
28	43	22,15	S3
29	46	21	G17
30	46	24	G13
31	52,2	20,1	Ph
32	49,5	22,8	Ph
33	52,2	22,8	Ph
34	49,5	25,5	Ph
35	52,2	25,5	Ph
36	49,5	28,2	Ph
37	52,2	28,2	Ph



Pinout



Identification

ID	Component	Voltage	Current	Function	Comment
T11, T15, T12, T16	IGBT	650 V	150 A	Buck Switch	Parallel devices with separate control. Values apply to complete device.
D11, D12	FWD	650 V	100 A	Buck Diode	
T13, T17, T14, T18	IGBT	650 V	150 A	Boost Switch	Parallel devices with separate control. Values apply to complete device.
D13, D17, D14, D18	FWD	650 V	100 A	Boost Diode	
D44, D48, D43, D47	FWD	650 V	100 A	Boost Sw. Inv. Diode	
C1, C2	Capacitor	630 V		Capacitor (DC)	
Rt	Thermistor			Thermistor	

Packaging instruction				
Standard packaging quantity (SPQ) 100	>SPQ	Standard	<SPQ	Sample

Handling instruction
Handling instructions for *flow* 1 packages see vincotech.com website.

Package data
Package data for *flow* 1 packages see vincotech.com website.

Vincotech thermistor reference
See Vincotech thermistor reference table at 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-FY07NPA150SM01-L364F08-D7-14	27 Sep. 2021	New Datasheet format, module is unchanged Correct Thermal values of Boost Sw. Inv. Diode Correct RBSOA graph of Boost Switch Separate datasheet for pressfit pin version	