70-W212NMA800M701-LC00F71
datasheet

VINcoMNPC X4 **1200 V / 800 A**

Topology features

- Common Emitter configuration
- Desaturation Pins
- Mixed Voltage Neutral Point Clamped Topology (T-Type)
- On-board Capacitors
- Temperature sensor

Component features

- Easy paralleling
- Low turn-off losses
- Low collector emitter saturation voltage
- Positive temperature coefficient
- Short tail current
- Switching optimized for EMC

Housing features

- Base isolation: Al_2O_3
- Optimized for three-level topologies
- Enables high switching frequencies
- Low inductive package
- Easy paralleling
- Optimal current sharing
- Thermo-mechanical push-and-pull force relief
- M6 High Power Screw Contact
- M4 Low Inductive Interface
- Press-fit connection to driver PCB

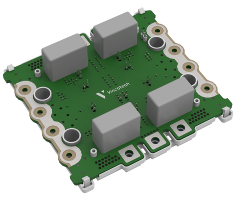
Target applications

- Solar Inverters
- UPS

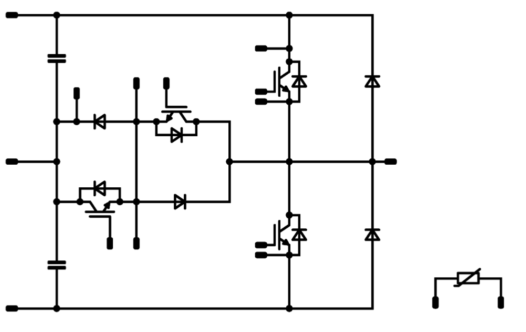
Types

- 70-W212NMA800M701-LC00F71

VINco X4 12 mm housing



Schematic



Maximum Ratings

T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Conditions		Value	Unit
Buck Switch					
Collector-emitter voltage	V_{CES}			1200	V
Collector current (DC current)⁰	I_C	$T_j = T_{jmax}$	T_s = 80 °C	562	A
Repetitive peak collector current	I_{CRM}	t_p limited by T_{jmax}		1600	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$	T_s = 80 °C	931	W
Gate-emitter voltage	V_{GES}			±20	V
Short circuit ratings	t_{SC}	V_{GE} = 15 V, V_{CC} = 800 V	T_j = 150 °C	9,5	μs
Maximum junction temperature	T_{jmax}			175	°C
Buck Diode					
Peak repetitive reverse voltage	V_{RRM}			650	V
Forward current (DC current)⁰	I_F	$T_j = T_{jmax}$	T_s = 80 °C	412	A
Repetitive peak forward current	I_{FRM}	t_p limited by T_{jmax}		1600	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$	T_s = 80 °C	552	W
Maximum junction temperature	T_{jmax}			175	°C
Buck Sw. Protection Diode					
Peak repetitive reverse voltage	V_{RRM}			1200	V
Forward current (DC current)	I_F	$T_j = T_{jmax}$	T_s = 80 °C	36	A
Surge (non-repetitive) forward current	I_{FSM}	Single Half Sine Wave, t_p = 10 ms	T_j = 25 °C	130	A
Surge current capability	I^2t			84	A^2s
Total power dissipation	P_{tot}	$T_j = T_{jmax}$	T_s = 80 °C	98	W
Maximum junction temperature	T_{jmax}			175	°C

Maximum Ratings

T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Conditions		Value	Unit
Boost Switch					
Collector-emitter voltage	V_{CES}			650	V
Collector current (DC current)◊	I_C	$T_j = T_{jmax}$	T_s = 80 °C	590	A
Repetitive peak collector current	I_{CRM}	t_p limited by T_{jmax}		1600	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$	T_s = 80 °C	736	W
Gate-emitter voltage	V_{GES}			±20	V
Short circuit ratings	t_{SC}	V_{GE} = 15 V, V_{CC} = 400 V	T_j = 150 °C	9	μs
Maximum junction temperature	T_{jmax}			175	°C
Boost Diode					
Peak repetitive reverse voltage	V_{RRM}			1200	V
Forward current (DC current)◊	I_F	$T_j = T_{jmax}$	T_s = 80 °C	407	A
Repetitive peak forward current	I_{FRM}	t_p limited by T_{jmax}		1600	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$	T_s = 80 °C	594	W
Maximum junction temperature	T_{jmax}			175	°C
Boost Sw. Protection Diode					
Peak repetitive reverse voltage	V_{RRM}			650	V
Forward current (DC current)	I_F	$T_j = T_{jmax}$	T_s = 80 °C	48	A
Repetitive peak forward current	I_{FRM}	t_p limited by T_{jmax}		80	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$	T_s = 80 °C	84	W
Maximum junction temperature	T_{jmax}			175	°C
Capacitor (DC)					
Maximum DC voltage	V_{MAX}			630	V
Operation Temperature	T_{op}			-40 … 105	°C

Maximum Ratings

T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Conditions		Value	Unit
Module Properties					
Thermal Properties					
Storage temperature	T_{stg}			-40…+125	°C
Operation temperature under switching condition	T_{jop}			-40…+(T_{jmax} - 25)	°C
Maximum allowed PCB temperature	T_{PCB}			125	°C
Isolation Properties					
Isolation voltage	V_{isol}	DC Test Voltage*	t_p = 2 s	4000	V
Creepage distance				>12,7	mm
Clearance				>12,7	mm
Comparative Tracking Index	CTI			≥ 200	

*100 % tested in production
⁰limited by T_{PCB}

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	$V_{GE(th)}$			10	0,08	25	5,4	6	6,6	V
Collector-emitter saturation voltage	V_{CEsat}		15		800	25 125 150		1,69 1,88 1,93	1,85(1)	V
Collector-emitter cut-off current	I_{CES}		0	1200		25			400	µA
Gate-emitter leakage current	I_{GES}		20	0		25			2000	nA
Internal gate resistance	r_g							0,5		Ω
Input capacitance	C_{ies}		0	10		25		148000		pF
Output capacitance	C_{oes}		0	10		25		4400		pF
Reverse transfer capacitance	C_{res}		0	10		25		1680		pF
Gate charge	Q_g	V_{CC} = 600 V	0/15		800	25		4800		nC
Thermal										
Thermal resistance junction to sink(2)	$R_{th(j-s)}$	λ_{paste} = 3,4 W/mK (PSX)						0,1		K/W
Dynamic										
Turn-on delay time	$t_{d(on)}$	R_{gon} = 0,75 Ω R_{goff} = 0,75 Ω	-8/16	350	800	25 125 150		374 377 375		ns
Rise time	t_r	R_{gon} = 0,75 Ω R_{goff} = 0,75 Ω	-8/16	350	800	25 125 150		102 108 108		ns
Turn-off delay time	$t_{d(off)}$	R_{gon} = 0,75 Ω R_{goff} = 0,75 Ω	-8/16	350	800	25 125 150		271 293 296		ns
Fall time	t_f	R_{gon} = 0,75 Ω R_{goff} = 0,75 Ω	-8/16	350	800	25 125 150		66,64 79,91 81,4		ns
Turn-on energy (per pulse)	E_{on}	Q_{rFWD}=75,38 µC Q_{rFWD}=127,61 µC Q_{rFWD}=156,69 µC	-8/16	350	800	25 125 150		34,1 45,92 47,53		mWs
Turn-off energy (per pulse)	E_{off}		-8/16	350	800	25 125 150		33,39 42,92 42,87		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				800	25 125 150		1,71 1,75 1,74	1,85[1]	V
Reverse leakage current	I_R	V_r = 650 V				25			200	µA
Thermal										
Thermal resistance junction to sink[2]	$R_{th(j-s)}$	λ_{paste} = 3,4 W/mK (PSX)						0,17		K/W
Dynamic										
Peak recovery current	I_{RM}	d*i*/d*t*=6065 A/µs d*i*/d*t*=6272 A/µs d*i*/d*t*=6205 A/µs	-8/16	350	800	25 125 150		342,09 370,43 392,07		A
Reverse recovery time	t_{rr}					25 125 150		660,78 1001 1152		ns
Recovered charge	Q_r					25 125 150		75,38 127,61 156,69		µC
Reverse recovered energy	E_{rec}					25 125 150		18,83 31,67 39,93		mWs
Peak rate of fall of recovery current	$(di_{rf}/dt)_{max}$					25 125 150		3722 2710 2551		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	
Buck Sw. Protection Diode										
Static										
Forward voltage	V_F				30	25 125 150		2,37 2,47	2,71(1) 2,77(1)	V
Reverse leakage current	I_R	V_r = 1200 V				25 150		 1800	120 3600	µA
Thermal										
Thermal resistance junction to sink(2)	$R_{th(j-s)}$	λ_{paste} = 3,4 W/mK (PSX)						0,97		K/W

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	$V_{GE(th)}$			10	0,08	25	5,4	6	6,6	V
Collector-emitter saturation voltage	V_{CEsat}		15		800	25 125 150		1,35 1,39 1,41	1,6(1)	V
Collector-emitter cut-off current	I_{CES}		0	650		25			200	µA
Gate-emitter leakage current	I_{GES}		20	0		25			2000	nA
Internal gate resistance	r_g							0,75		Ω
Input capacitance	C_{ies}		0	10		25		96		nF
Output capacitance	C_{oes}							4		nF
Reverse transfer capacitance	C_{res}							1,88		nF
Gate charge	Q_g	V_{CC} = 300 V	15		800	25		3320		nC
Thermal										
Thermal resistance junction to sink(2)	$R_{th(j-s)}$	λ_{paste} = 3,4 W/mK (PSX)						0,13		K/W
Dynamic										
Turn-on delay time	$t_{d(on)}$	R_{gon} = 0,75 Ω R_{goff} = 0,75 Ω	-8/16	350	800	25 125 150		268 275 275		ns
Rise time	t_r					25 125 150		92 94 96		ns
Turn-off delay time	$t_{d(off)}$					25 125 150		224 258 268		ns
Fall time	t_f					25 125 150		70,15 89,73 96,36		ns
Turn-on energy (per pulse)	E_{on}	Q_{rFWD}=55,43 µC Q_{rFWD}=82,14 µC Q_{rFWD}=87,68 µC				25 125 150		28,96 37,61 39,92		mWs
Turn-off energy (per pulse)	E_{off}					25 125 150		30,32 39,45 43,61		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				800	25 125 150		1,67 1,83 1,83	2,1(1)	V
Reverse leakage current	I_R	V_r = 1200 V				25			160	µA
Thermal										
Thermal resistance junction to sink(2)	$R_{th(j-s)}$	λ_{paste} = 3,4 W/mK (PSX)						0,16		K/W
Dynamic										
Peak recovery current	I_{RM}	d*i*/d*t*=7722 A/µs d*i*/d*t*=7739 A/µs d*i*/d*t*=7571 A/µs	-8/16	350	800	25 125 150		424,43 463,8 475,5		A
Reverse recovery time	t_{rr}					25 125 150		335,46 471,67 456,91		ns
Recovered charge	Q_r					25 125 150		55,43 82,14 87,68		µC
Reverse recovered energy	E_{rec}					25 125 150		12,2 18,21 19,29		mWs
Peak rate of fall of recovery current	$(di_{rf}/dt)_{max}$					25 125 150		4416 3530 3572		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 Sw. Protection Diode										
Static										
Forward voltage	V_F				40	25 125 150	1,23	1,74 1,65 1,61	1,87[1]	V
Reverse leakage current	I_R	V_r = 650 V				25			0,48	µA
Thermal										
Thermal resistance junction to sink[2]	$R_{th(j-s)}$	λ_{paste} = 3,4 W/mK (PSX)						1,14		K/W
Capacitor (DC)										
Static										
Capacitance	C	DC bias voltage = 0 V				25		1360		nF
Tolerance							-10		10	%
Thermistor										
Static										
Rated resistance	R					25		22		kΩ
Deviation of R100	$\Delta_{R/R}$	R_{100} = 1484 Ω				100	-5		5	%
Power dissipation	P					25		130		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	

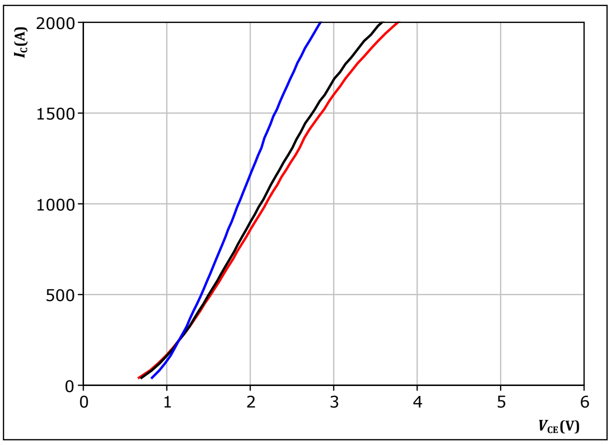
(1) Value at chip level
(2) Only valid with pre-applied Vincotech thermal interface material.

Buck Switch Characteristics

figure 1. **IGBT**

Typical output characteristics

$I_C = f(V_{CE})$



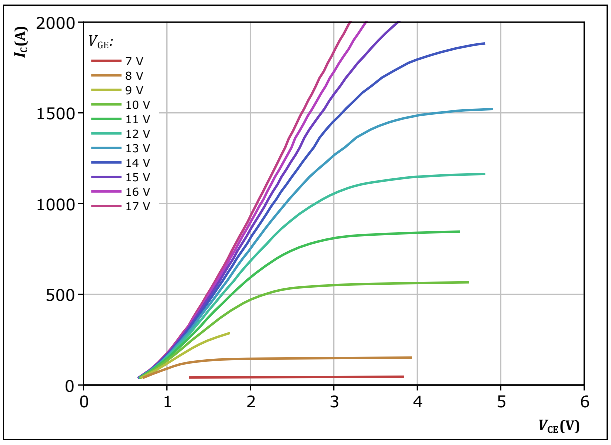
t_p =	250	µs
V_{GE} =	15	V

T_j: 25 °C, 125 °C, 150 °C

figure 2. **IGBT**

Typical output characteristics

$I_C = f(V_{CE})$



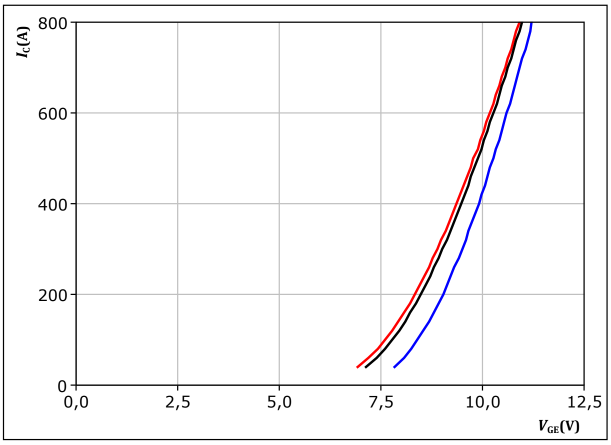
t_p =	250	µs
T_j =	150	°C

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

figure 3. **IGBT**

Typical transfer characteristics

$I_C = f(V_{GE})$



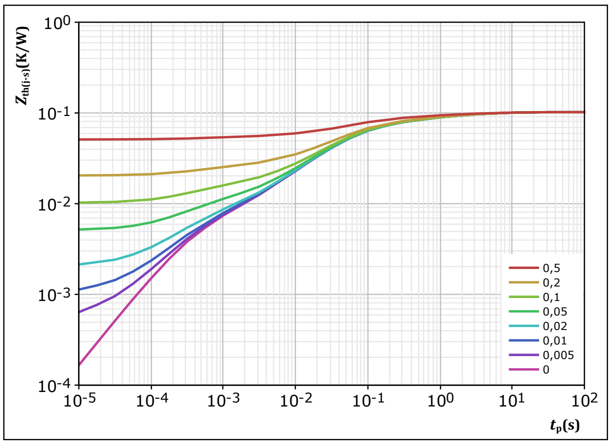
t_p =	250	µs
V_{CE} =	10	V

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	
$R_{th(j-s)}$ =	0,102	K/W

IGBT thermal model values

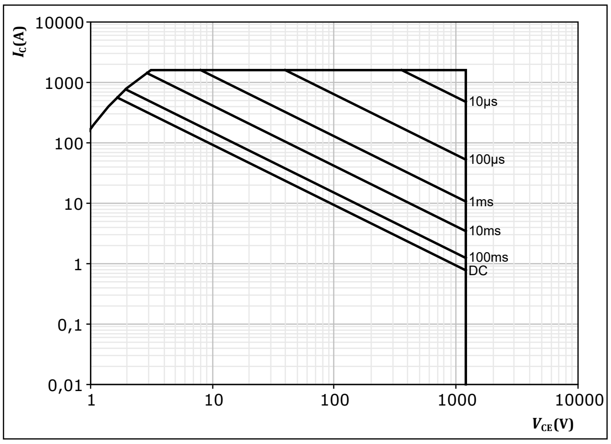
R (K/W)	τ (s)
8,39E-03	5,43E+00
1,48E-02	9,81E-01
2,16E-02	1,80E-01
3,68E-02	4,67E-02
1,19E-02	1,41E-02
3,66E-03	2,87E-03
4,90E-03	3,56E-04

Buck Switch Characteristics

figure 5. **IGBT**

Safe operating area

I_C = f(V_{CE})

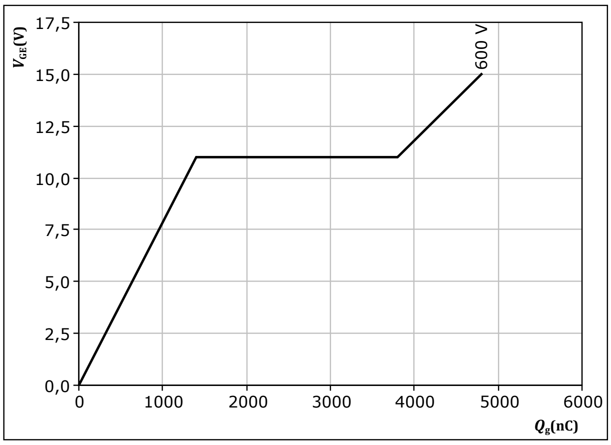


D =	single pulse	
T_s =	80	°C
V_{GE} =	15	V
T_j =	T_{jmax}	

figure 6. **IGBT**

Gate voltage vs gate charge

V_{GE} = f(Q_g)



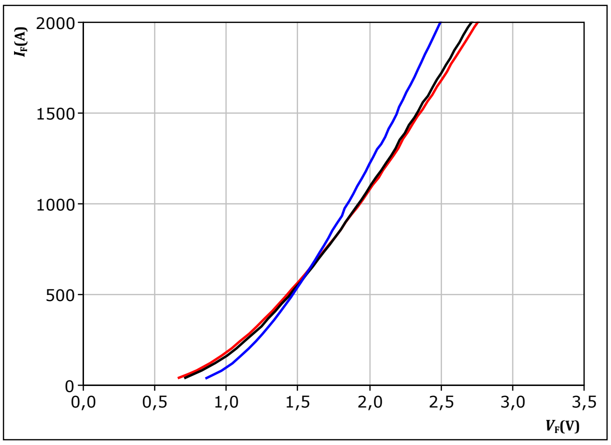
I_C =	800	A
T_j =	25	°C

Buck Diode Characteristics

figure 7. **FWD**

Typical forward characteristics

$I_F = f(V_F)$



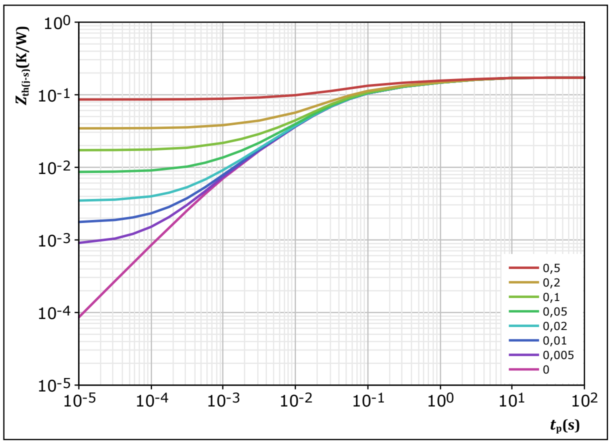
t_p = 250 µs

T_j: 25 °C, 125 °C, 150 °C

figure 8. **FWD**

Transient thermal impedance as a function of pulse width

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



D = t_p / T

$R_{th(j-s)}$ = 0,172 K/W

FWD thermal model values

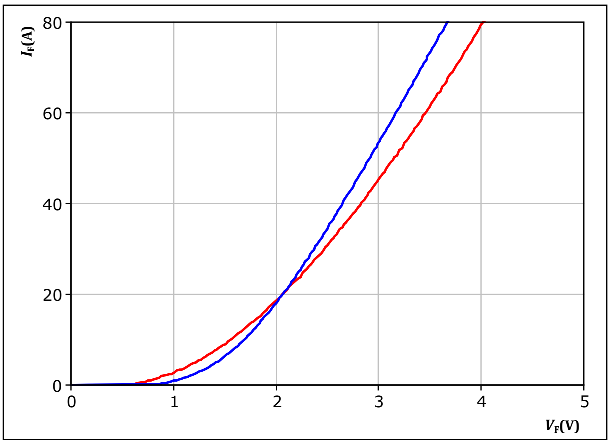
R (K/W)	τ (s)
2,24E-02	4,04E+00
2,50E-02	8,39E-01
3,85E-02	1,56E-01
6,61E-02	3,22E-02
1,48E-02	7,54E-03
5,22E-03	1,20E-03

Buck Sw. Protection Diode Characteristics

figure 9. FWD

Typical forward characteristics

I_F = f(V_F)



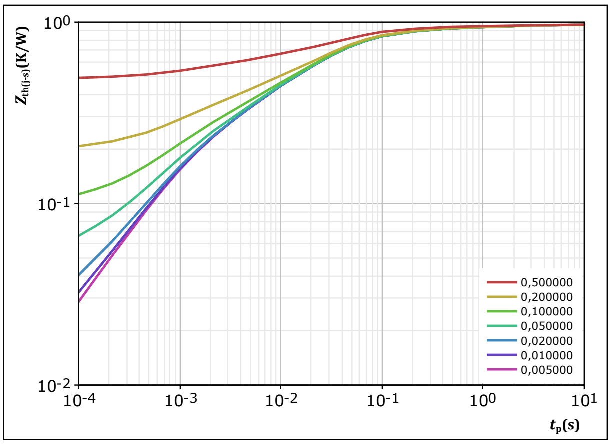
t_p = 250 µs

T_j: 25 °C, 125 °C

figure 10. FWD

Transient thermal impedance as a function of pulse width

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



D = t_p / T

$R_{th(j-s)}$ = 0,968 K/W

FWD thermal model values

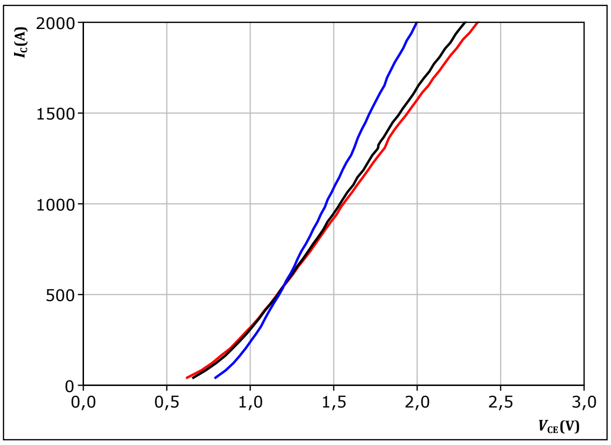
R (K/W)	τ (s)
1,95E-02	5,74E+00
4,03E-02	1,10E+00
1,37E-01	1,35E-01
4,48E-01	2,90E-02
1,88E-01	4,59E-03
1,29E-01	8,12E-04
8,45E-03	9,28E-05

Boost Switch Characteristics

figure 11. **IGBT**

Typical output characteristics

I_C = f(V_{CE})

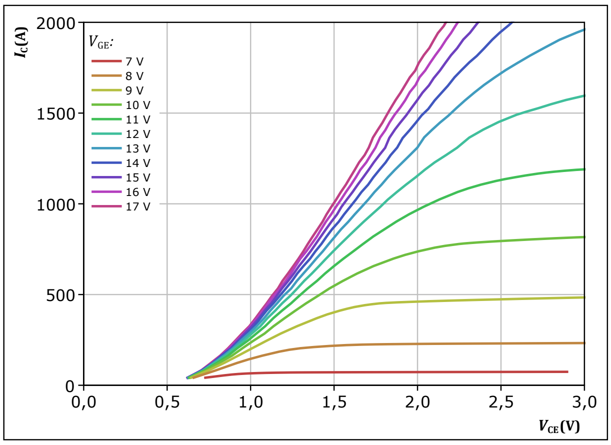


t_p =	250	μs	
V_{GE} =	15	V	T_j: 25 °C, 125 °C, 150 °C

figure 12. **IGBT**

Typical output characteristics

I_C = f(V_{CE})



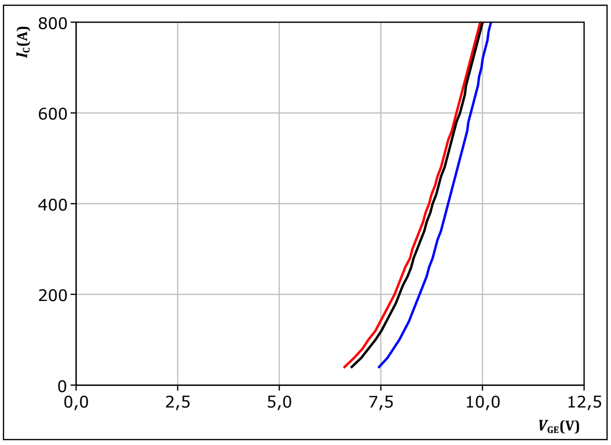
t_p =	250	μs
T_j =	150	°C

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

figure 13. **IGBT**

Typical transfer characteristics

I_C = f(V_{GE})

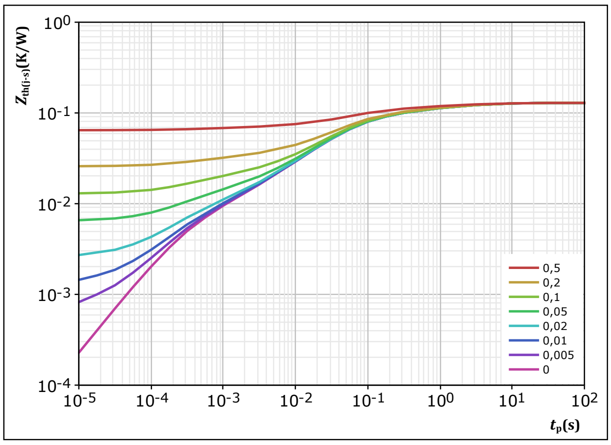


t_p =	250	μs	
V_{CE} =	10	V	T_j: 25 °C, 125 °C, 150 °C

figure 14. **IGBT**

Transient thermal impedance as a function of pulse width

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



D =	t_p / T	
$R_{th(j-s)}$ =	0,129	K/W

IGBT thermal model values

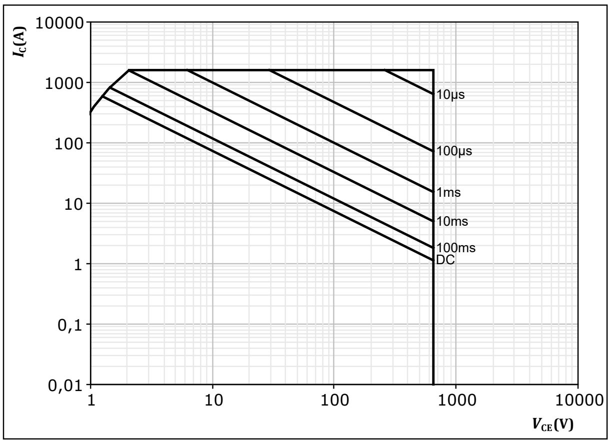
R (K/W)	τ (s)
9,57E-03	5,87E+00
1,84E-02	1,16E+00
3,14E-02	1,83E-01
5,00E-02	4,07E-02
1,05E-02	8,38E-03
4,22E-03	1,32E-03
4,83E-03	2,81E-04

Boost Switch Characteristics

figure 15.	IGBT

Safe operating area

I_C = f(V_{CE})

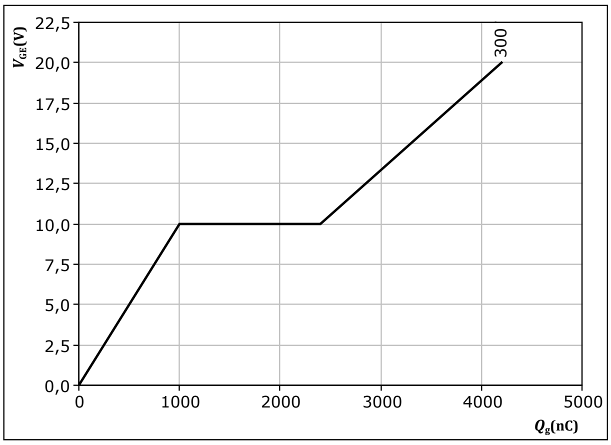


D = single pulse
T_s = 80 °C
V_{GE} = 15 V
T_j = T_{jmax}

figure 16.	IGBT

Gate voltage vs gate charge

V_{GE} = f(Q_g)



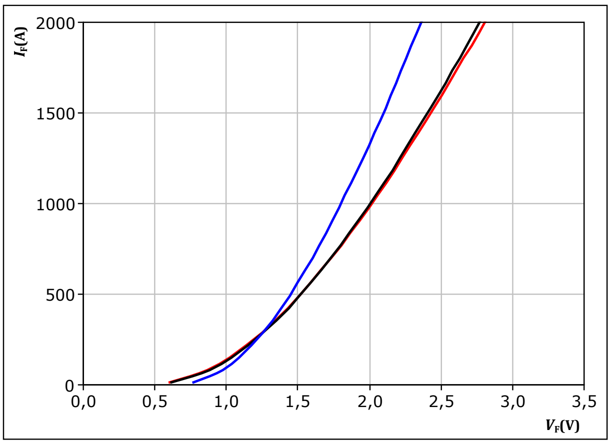
I_C = 800 A
T_j = 25 °C

Boost Diode Characteristics

figure 17. **FWD**

Typical forward characteristics

I_F = f(V_F)



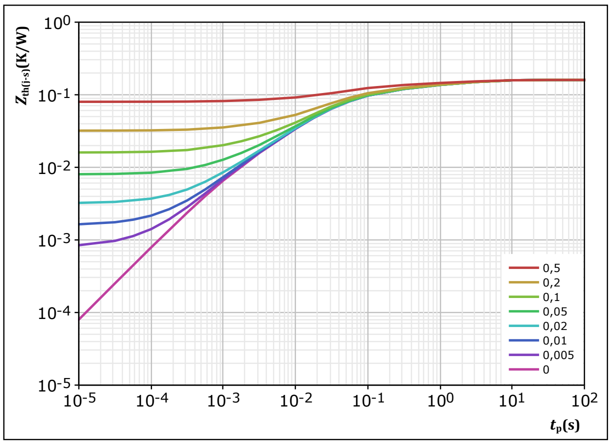
t_p = 250 µs

T_j: 25 °C, 125 °C, 150 °C

figure 18. **FWD**

Transient thermal impedance as a function of pulse width

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



D = t_p / T

$R_{th(j-s)}$ = 0,16 K/W

FWD thermal model values

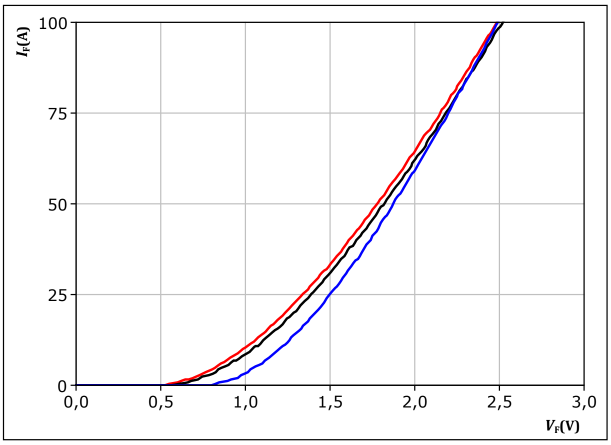
R (K/W)	τ (s)
2,09E-02	4,04E+00
2,33E-02	8,39E-01
3,58E-02	1,56E-01
6,15E-02	3,22E-02
1,37E-02	7,54E-03
4,85E-03	1,20E-03

Boost Sw. Protection Diode Characteristics

figure 19. FWD

Typical forward characteristics

$I_F = f(V_F)$



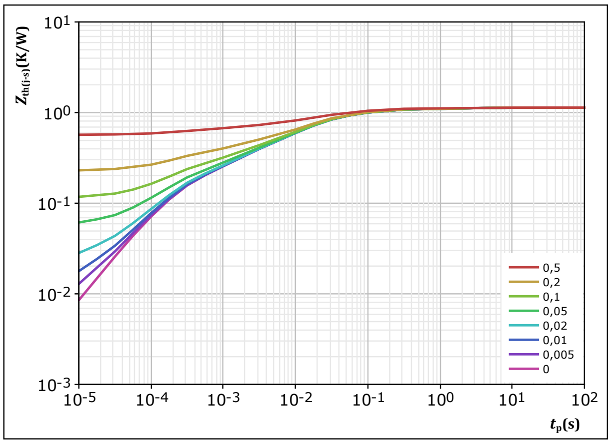
t_p = 250 µs

T_j: 25 °C, 125 °C, 150 °C

figure 20. FWD

Transient thermal impedance as a function of pulse width

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



D = t_p / T

$R_{th(j-s)}$ = 1,135 K/W

FWD thermal model values

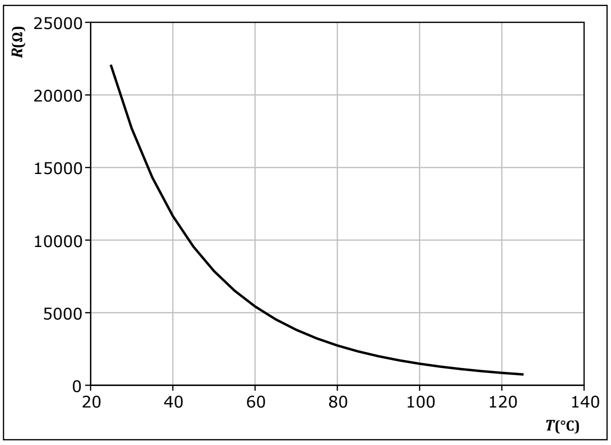
R (K/W)	τ (s)
5,28E-02	2,41E+00
2,30E-01	9,67E-02
5,00E-01	1,70E-02
1,99E-01	2,18E-03
1,53E-01	2,04E-04

Thermistor Characteristics

figure 21.	Thermistor

Typical NTC characteristic as function of temperature

R_T = f(T)

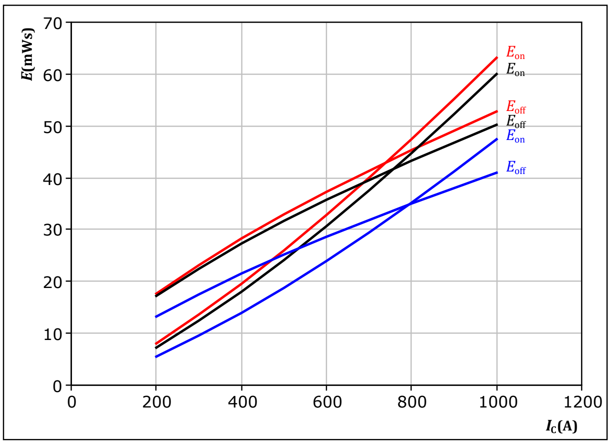


Buck Switching Characteristics

figure 22. **IGBT**

Typical switching energy losses as a function of collector current

E = f(I_C)



With an inductive load at

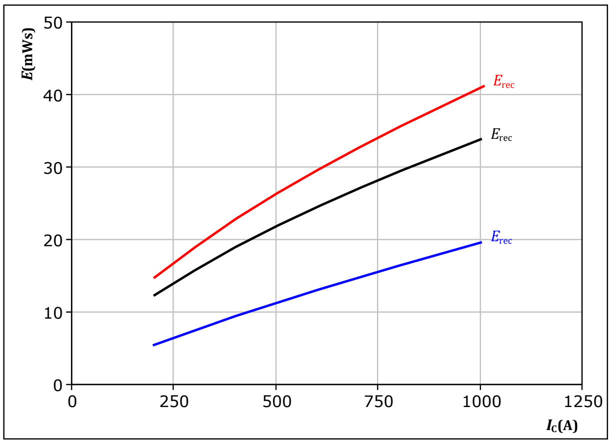
V_{CE} =	350	V	
V_{GE} =	-8/16	V	
R_{gon} =	0,75	Ω	
R_{goff} =	0,75	Ω	

T_j: 25 °C, 125 °C, 150 °C

figure 23. **FWD**

Typical reverse recovered energy loss as a function of collector current

E_{rec} = f(I_C)



With an inductive load at

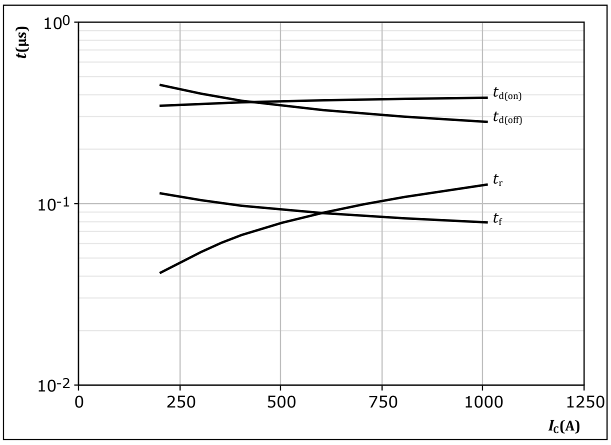
V_{CE} =	350	V
V_{GE} =	-8/16	V
R_{gon} =	0,75	Ω

T_j: 25 °C, 125 °C, 150 °C

figure 24. **IGBT**

Typical switching times as a function of collector current

t = f(I_C)



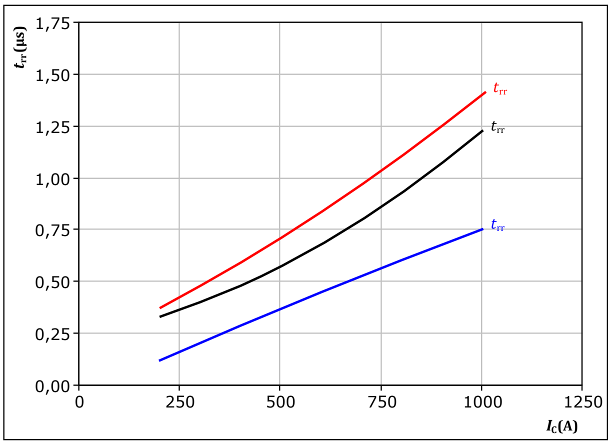
With an inductive load at

T_j =	150	°C
V_{CE} =	350	V
V_{GE} =	-8/16	V
R_{gon} =	0,75	Ω
R_{goff} =	0,75	Ω

figure 25. **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} =	-8/16	V
R_{gon} =	0,75	Ω

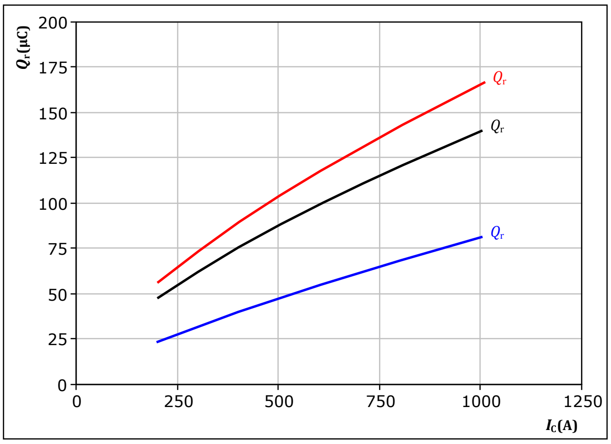
T_j: 25 °C, 125 °C, 150 °C

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

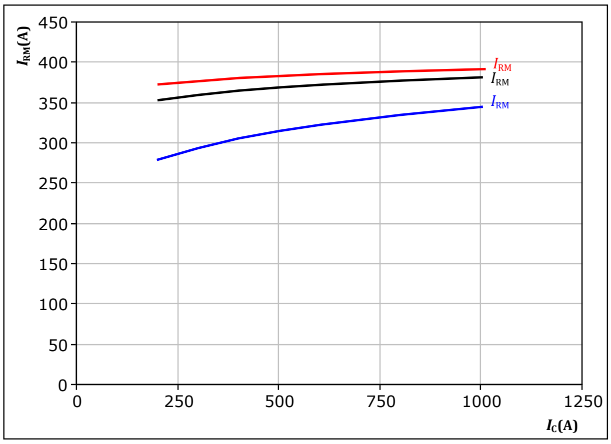
V_{CE} = 350 V
V_{GE} = -8/16 V
R_{gon} = 0,75 Ω

T_j: 25 °C, 125 °C, 150 °C

figure 27. **FWD**

Typical peak reverse recovery current as a function of collector current

I_{RM} = f(I_C)



With an inductive load at

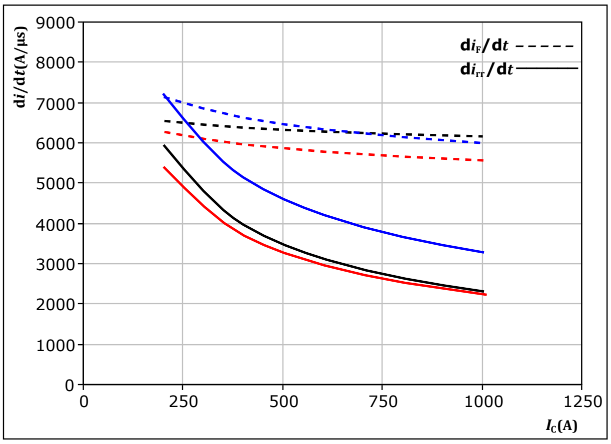
V_{CE} = 350 V
V_{GE} = -8/16 V
R_{gon} = 0,75 Ω

T_j: 25 °C, 125 °C, 150 °C

figure 28. **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

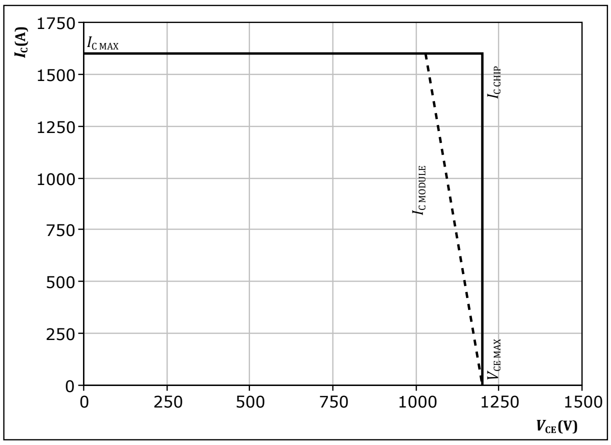
V_{CE} = 350 V
V_{GE} = -8/16 V
R_{gon} = 0,75 Ω

T_j: 25 °C, 125 °C, 150 °C

figure 29. **IGBT**

Reverse bias safe operating area

I_C = f(V_{CE})



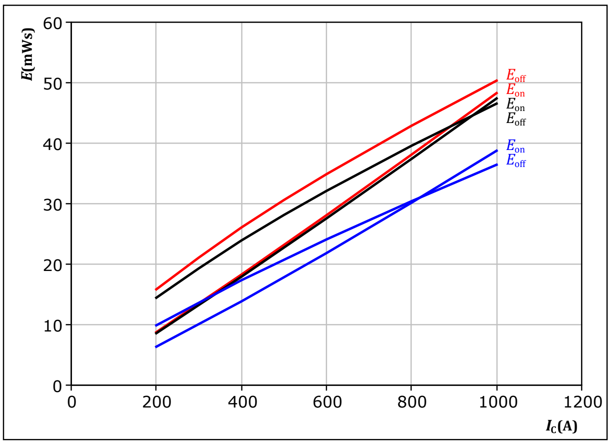
At
T_j = 150 °C
R_{gon} = 0,75 Ω
R_{goff} = 0,75 Ω

Boost Switching Characteristics

figure 30. **IGBT**

Typical switching energy losses as a function of collector current

$E = f(I_C)$



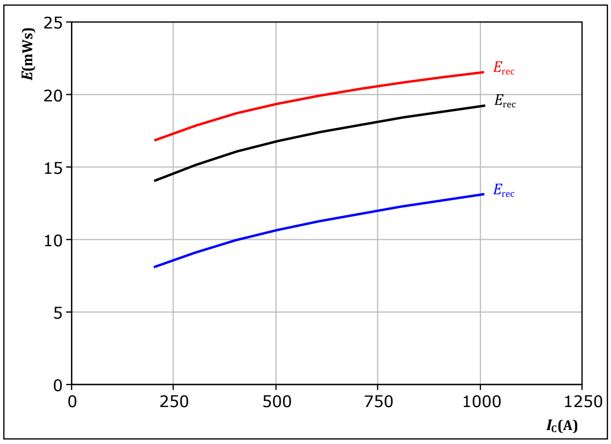
With an inductive load at

V_{CE} =	350	V	T_j:	25 °C
V_{GE} =	-8/16	V		125 °C
R_{gon} =	0,75	Ω		150 °C
R_{goff} =	0,75	Ω		

figure 31. **FWD**

Typical reverse recovered energy loss as a function of collector current

$E_{rec} = f(I_C)$



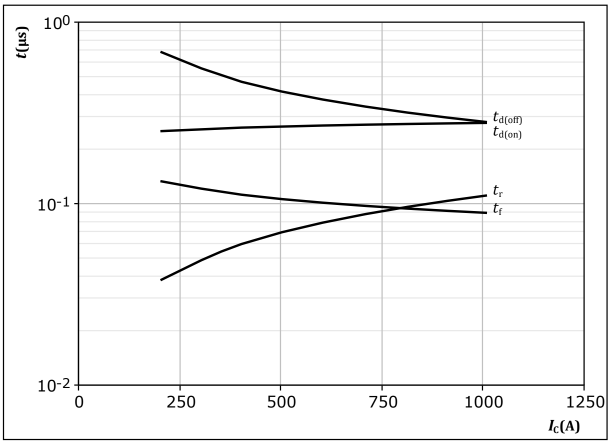
With an inductive load at

V_{CE} =	350	V	T_j:	25 °C
V_{GE} =	-8/16	V		125 °C
R_{gon} =	0,75	Ω		150 °C

figure 32. **IGBT**

Typical switching times as a function of collector current

$t = f(I_C)$



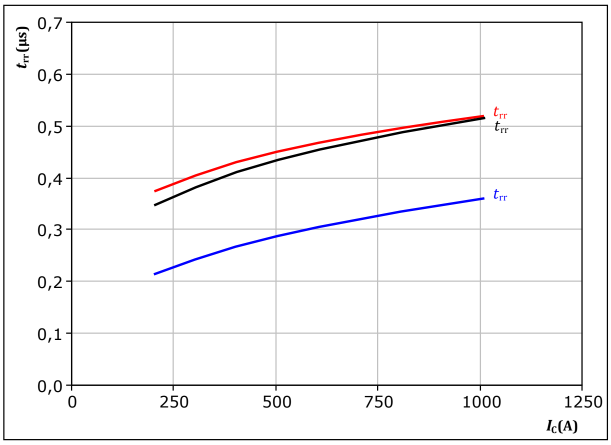
With an inductive load at

T_j =	150	°C
V_{CE} =	350	V
V_{GE} =	-8/16	V
R_{gon} =	0,75	Ω
R_{goff} =	0,75	Ω

figure 33. **FWD**

Typical reverse recovery time as a function of collector current

$t_{rr} = f(I_C)$



With an inductive load at

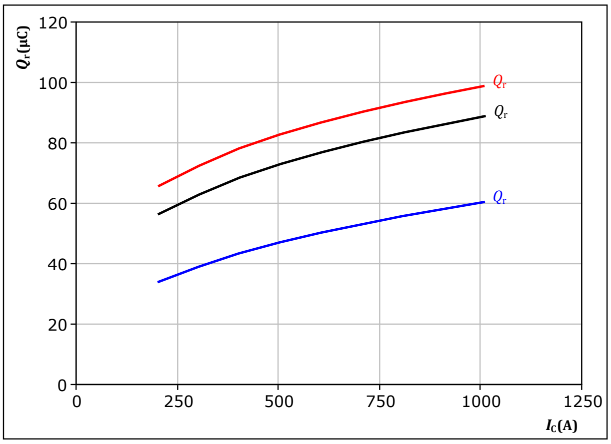
V_{CE} =	350	V	T_j:	25 °C
V_{GE} =	-8/16	V		125 °C
R_{gon} =	0,75	Ω		150 °C

Boost Switching Characteristics

figure 34. FWD

Typical recovered charge as a function of collector current

$Q_r = f(I_C)$



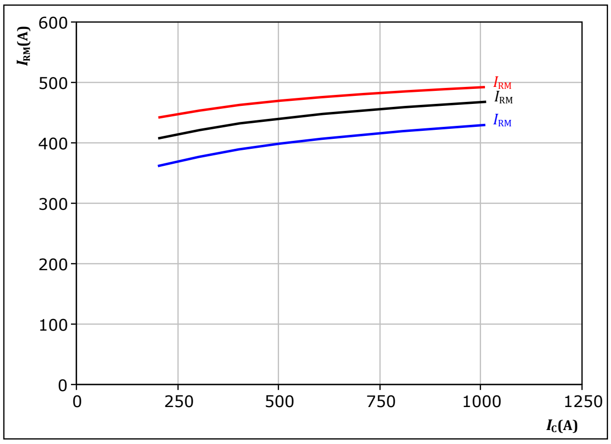
With an inductive load at

V_{CE} =	350	V	T_j: 25 °C / 125 °C / 150 °C
V_{GE} =	-8/16	V	
R_{gon} =	0,75	Ω	

figure 35. FWD

Typical peak reverse recovery current as a function of collector current

$I_{RM} = f(I_C)$



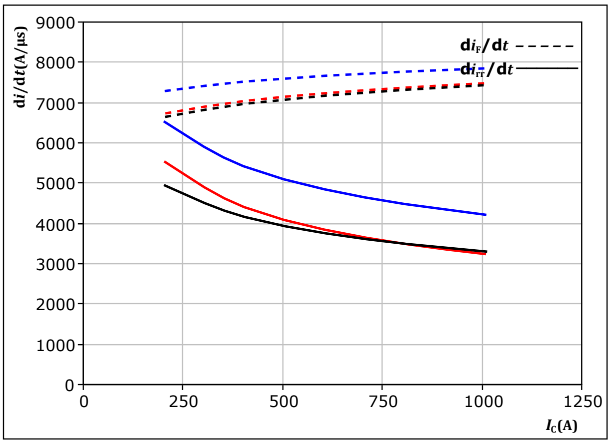
With an inductive load at

V_{CE} =	350	V	T_j: 25 °C / 125 °C / 150 °C
V_{GE} =	-8/16	V	
R_{gon} =	0,75	Ω	

figure 36. FWD

Typical rate of fall of forward and reverse recovery current as a function of collector current

$di_F/dt,\ di_{rr}/dt = f(I_C)$



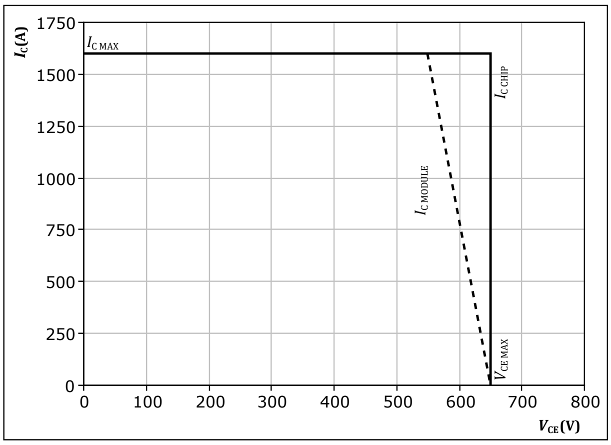
With an inductive load at

V_{CE} =	350	V	T_j: 25 °C / 125 °C / 150 °C
V_{GE} =	-8/16	V	
R_{gon} =	0,75	Ω	

figure 37. IGBT

Reverse bias safe operating area

$I_C = f(V_{CE})$



At	T_j =	150	°C
	R_{gon} =	0,75	Ω
	R_{goff} =	0,75	Ω

Switching Definitions

figure 38. **IGBT**

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

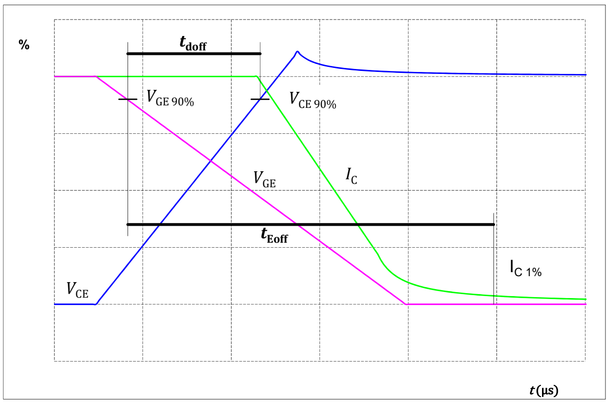


figure 39. **IGBT**

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

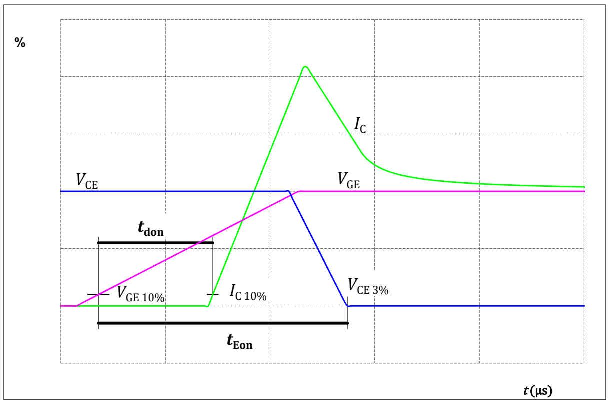


figure 40. **IGBT**

Turn-off Switching Waveforms & definition of t_f

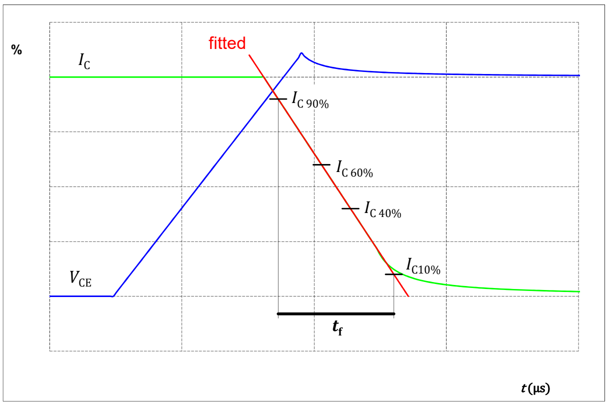
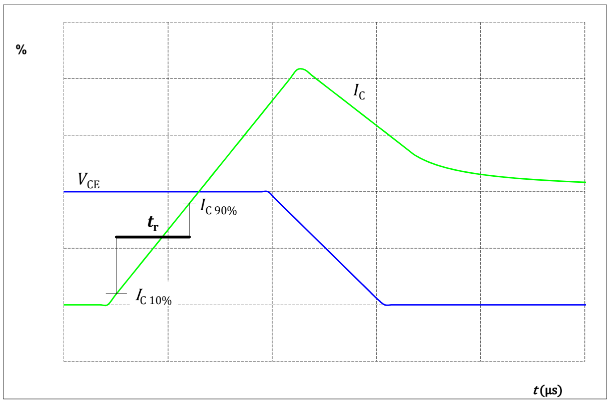


figure 41. **IGBT**

Turn-on Switching Waveforms & definition of t_r



Switching Definitions

figure 42. **FWD**

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

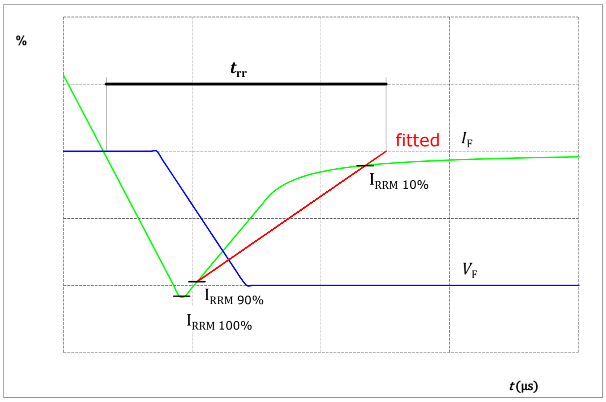
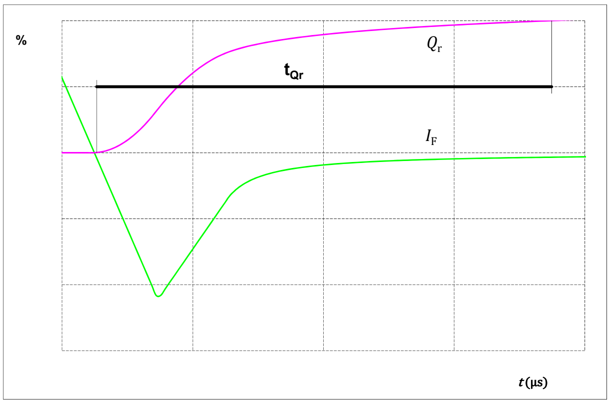


figure 43. **FWD**

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



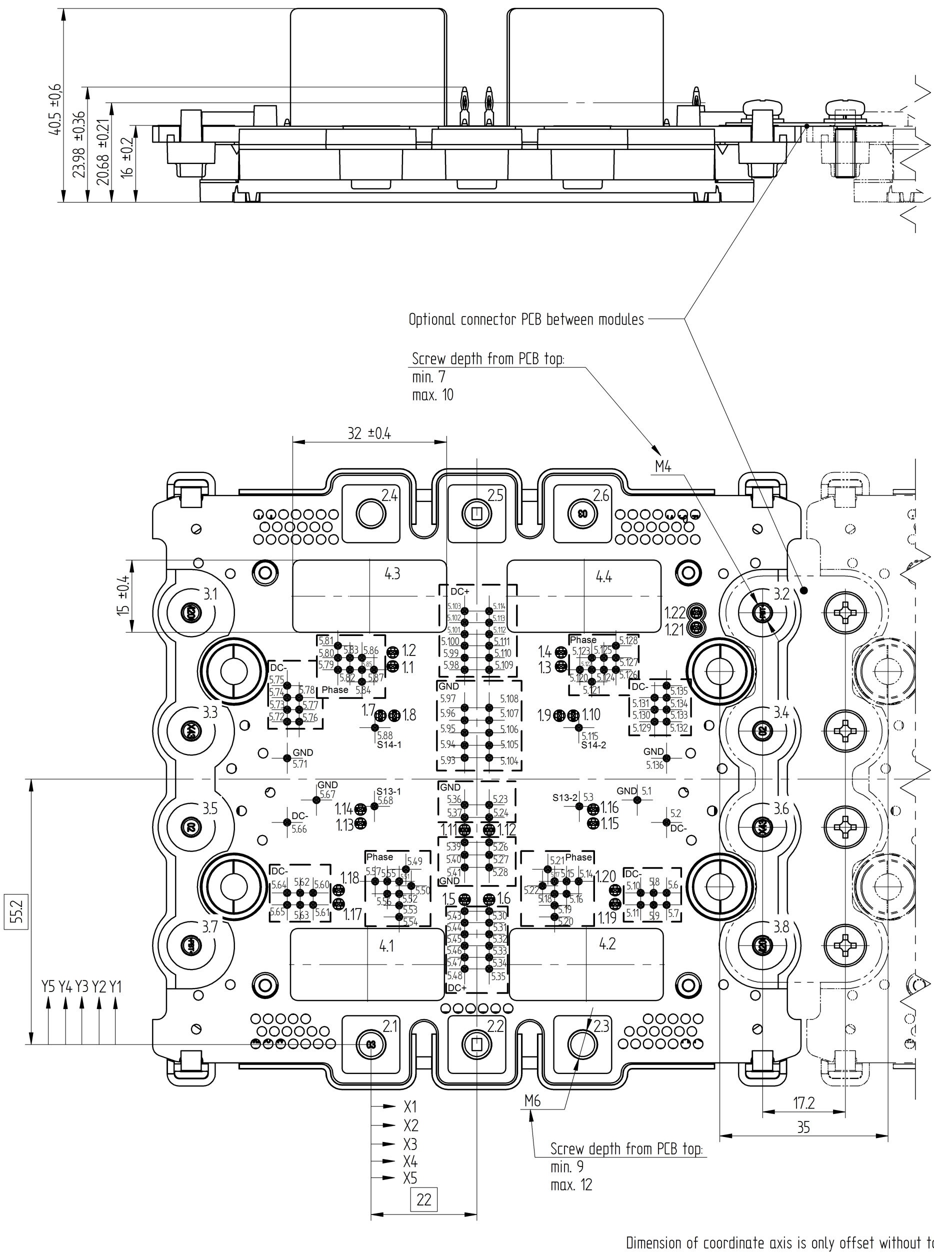
70-W212NMA800M701-LC00F71
datasheet

Ordering Code	
Version	**Ordering Code**
Without thermal paste	70-W212NMA800M701-LC00F71
With thermal paste (3,4 W/mK, PSX-P7)	70-W212NMA800M701-LC00F71-/3/

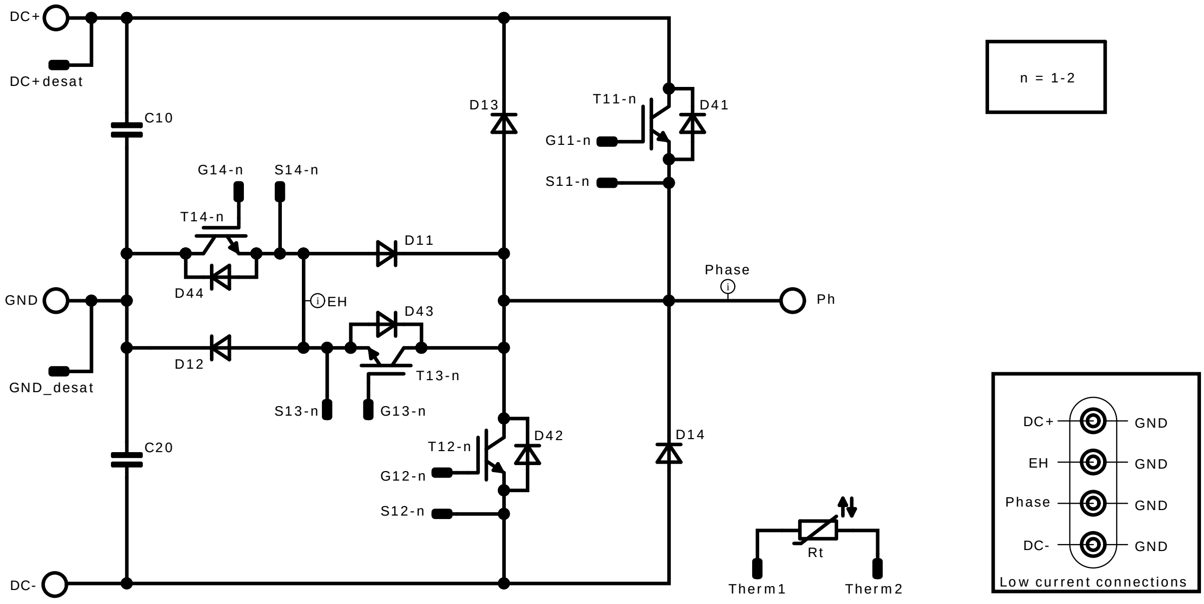
Marking							
	**Text**	**Name**		**Date code**	**UL & VIN**	**Lot**	**Serial**
		NN-NNNNNNNNNNNNNN-TTTTTTTVV		WWYY	UL VIN	LLLLL	SSSS
	Datamatrix	**Type&Ver**	**Lot number**	**Serial**	**Date code**		
		TTTTTTTVV	LLLLL	SSSS	WWYY		

Outline

Pin table [mm]			
Pin	X	Y	Function
1.1	4,5	78,65	G11-1
1.2	4,5	81,55	S11-1
1.3	39,5	78,65	G11-2
1.4	39,5	81,55	S11-2
1.5	19,45	30,15	DC+
1.6	24,55	30,15	DC+
1.7	1,95	68,4	S14-1
1.8	4,85	68,4	G14-1
1.9	39,15	68,4	G14-2
1.10	42,05	68,4	S14-2
1.11	19,45	44,65	GND
1.12	24,55	44,65	GND
1.13	-2,2	46	G13-1
1.14	-2,2	48,9	S13-1
1.15	46,2	46	G13-2
1.16	46,2	48,9	S13-2
1.17	-6,75	29,2	S12-1
1.18	-6,75	32,1	G12-1
1.19	50,75	29,2	S12-2
1.20	50,75	32,1	G12-2
1.21	67,65	86,7	Therm2
1.22	67,65	89,8	Therm1
2.1	0	0	Phase
2.2	22	0	Phase
2.3	44	0	Phase
2.4	0	110,4	DC+
2.5	22	110,4	Neutral
2.6	44	110,4	DC-
3.1	-37,4	89,8	DC+
3.2	81,4	89,8	DC+
3.3	-37,4	65,2	CE
3.4	81,4	65,2	CE
3.5	-37,4	45,2	Phase
3.6	81,4	45,2	Phase
3.7	-37,4	20,6	DC-
3.8	81,4	20,6	DC-
4.1	-0,75	16,65	
4.2	44,75	16,65	
4.3	-0,3	93,25	
4.4	44,3	93,25	



Pinout



NOTE: Driver pins for parallel devices are not connected inside the module!

Identification

ID	Component	Voltage	Current	Function	Comment
T11, T12	IGBT	1200 V	800 A	Buck Switch	
D11, D12	FWD	650 V	800 A	Buck Diode	
D41, D42	FWD	1200 V	30 A	Buck Sw. Protection Diode	
T13, T14	IGBT	650 V	800 A	Boost Switch	
D13, D14	FWD	1200 V	800 A	Boost Diode	
D43, D44	FWD	650 V	40 A	Boost Sw. Protection Diode	
C10, C20	Capacitor	630 V		Capacitor (DC)	
Rt	NTC			Thermistor	

Packaging instruction				
Standard packaging quantity (SPQ) 8	>SPQ	Standard	<SPQ	Sample

Handling instruction
Handling instructions for VINco X4 packages see vincotech.com website.

Package data
Package data for VINco X4 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 UL 1557 recognized under E192116 up to a junction temperature under switching condition $T_{j,op}$=175°C and up to 3500VAC/1min isolation voltage. For more information see vincotech.com website.

Document No.:	Date:	Modification:	Pages
70-W212NMA800M701-LC00F71-D1-14	6 Dec. 2024	Initial Release	