80-M212WPA050M701-K750F71
datasheet

MiniSKiiP Twin 2 **1200 V / 50 A**

Topology features

- Open Emitter configuration
- Temperature sensor
- 2xInverter

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
- Easy assembly in one mounting step
- Flexible PCB design w/o pin holes
- Rugged solderless spring contacts

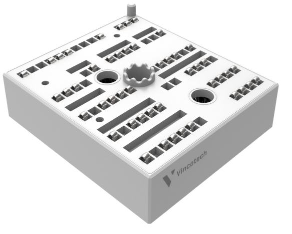
Target applications

- Embedded Drives
- Industrial Drives
- Servo Drives

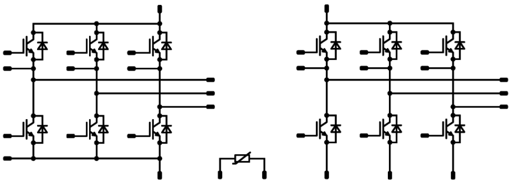
Types

- 80-M212WPA050M701-K750F71

MiniSKiiP® 2 16 mm housing



Schematic



Maximum Ratings

T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Conditions		Value	Unit
Inverter Switch					
Collector-emitter voltage	V_{CES}			1200	V
Collector current (DC current)	I_C	$T_j = T_{jmax}$	T_s <= 80 °C	30 (1)	A
Repetitive peak collector current	I_{CRM}	t_p limited by T_{jmax}		30	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$	T_s = 80 °C	79	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

(1) limited by I_{CRM}

Parameter	Symbol	Conditions		Value	Unit
Inverter Diode					
Peak repetitive reverse voltage	V_{RRM}			1600	V
Forward current (DC current)	I_F	$T_j = T_{jmax}$	T_s = 80 °C	43	A
Surge (non-repetitive) forward current	I_{FSM}	Single Half Sine Wave, t_p = 10 ms	T_j = 150 °C	200	A
Surge current capability	I^2t			200	A^2s
Total power dissipation	P_{tot}	$T_j = T_{jmax}$	T_s = 80 °C	58	W
Maximum junction temperature	T_{jmax}			150	°C
Inverter Switch 2					
Collector-emitter voltage	V_{CES}			1200	V
Collector current (DC current)	I_C	$T_j = T_{jmax}$	T_s = 80 °C	68	A
Repetitive peak collector current	I_{CRM}	t_p limited by T_{jmax}		100	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$	T_s = 80 °C	151	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

Maximum Ratings

T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Conditions		Value	Unit
Inverter Diode 2					
Peak repetitive reverse voltage	V_{RRM}			1200	V
Forward current (DC current)	I_F	$T_j = T_{jmax}$	T_s = 80 °C	38	A
Repetitive peak forward current	I_{FRM}	t_p limited by T_{jmax}		50	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$	T_s = 80 °C	75	W
Maximum junction temperature	T_{jmax}			175	°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	5500	V
Isolation voltage	V_{isol}	AC Voltage	t_p = 1 min	2500	V
Creepage distance		With std lid For more informations see handling instructions		6,3	mm
Clearance		With std lid For more informations see handling instructions		6,3	mm
Comparative Tracking Index	CTI			≥ 600	

*100 % tested in production

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	
Inverter Switch										
Static										
Gate-emitter threshold voltage	$V_{GE(th)}$			10	0,0015	25	5,4	6	6,6	V
Collector-emitter saturation voltage	V_{CEsat}		15		15	25 125 150		1,7 1,95 2,01	2,1(2)	V
Collector-emitter cut-off current	I_{CES}		0	1200		25			60	µA
Gate-emitter leakage current	I_{GES}		0	0		25			200	nA
Internal gate resistance	r_g							None		Ω
Input capacitance	C_{ies}		0	10		25		2900		pF
Output capacitance	C_{oes}							120		pF
Reverse transfer capacitance	C_{res}							34		pF
Gate charge	Q_g	V_{CC} = 600 V	0/15		15	25		110		nC
Thermal										
Thermal resistance junction to sink(3)	$R_{th(j-s)}$	λ_{paste} = 2,5 W/mK (HPTP)						1,2		K/W
Dynamic										
Turn-on delay time	$t_{d(on)}$	R_{gon} = 32 Ω R_{goff} = 32 Ω	±15	600	15	25 125		184,8 181		ns
Rise time	t_r					25 125		35,2 42		ns
Turn-off delay time	$t_{d(off)}$					25 125		180,2 203		ns
Fall time	t_f					25 125		85,46 110,53		ns
Turn-on energy (per pulse)	E_{on}	Q_{rFWD}=35,89 µC Q_{rFWD}=39,16 µC				25 125		18,25 21,27		mWs
Turn-off energy (per pulse)	E_{off}					25 125		1,01 1,38		mWs

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
Inverter Diode										
Static										
Forward voltage	V_F				18	25 125 150		1,12 1,03 1,02	1,5(2)	V
Reverse leakage current	I_R	V_r = 1600 V				25 150			100 1000	µA
Thermal										
Thermal resistance junction to sink(3)	$R_{th(j-s)}$	λ_{paste} = 2,5 W/mK (HPTP)						1,2		K/W
Dynamic										
Peak recovery current	I_{RM}	di/dt=413 A/µs di/dt=332 A/µs	±15	600	15	25 125		48,41 41,29		A
Reverse recovery time	t_{rr}					25 125		1587 1931		ns
Recovered charge	Q_r					25 125		35,89 39,16		µC
Reverse recovered energy	E_{rec}					25 125		8,6 8,91		mWs
Peak rate of fall of recovery current	$(di_{rf}/dt)_{max}$					25 125		113,02 76,45		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	
Inverter Switch 2										
Static										
Gate-emitter threshold voltage	$V_{GE(th)}$			10	0,005	25	5,4	6	6,6	V
Collector-emitter saturation voltage	V_{CEsat}		15		50	25 125 150		1,55 1,77 1,83	1,9(2)	V
Collector-emitter cut-off current	I_{CES}		0	1200		25			0,09	mA
Gate-emitter leakage current	I_{GES}		20	0		25			0,5	µA
Internal gate resistance	r_{g}							None		Ω
Input capacitance	C_{ies}		0	10		25		10000		pF
Output capacitance	C_{oes}							350		pF
Reverse transfer capacitance	C_{res}							130		pF
Gate charge	Q_{g}	V_{CC} = 600 V	0/15		50	25		380		nC
Thermal										
Thermal resistance junction to sink(3)	$R_{th(j-s)}$	λ_{paste} = 2,5 W/mK (HPTP)						0,63		K/W
Dynamic										
Turn-on delay time	$t_{d(on)}$	R_{gon} = 16 Ω R_{goff} = 16 Ω	±15	600	50	25 125 150		331,44 323,72 321,7		ns
Rise time	t_{r}					25 125 150		101,99 107,38 108,55		ns
Turn-off delay time	$t_{d(off)}$					25 125 150		249,33 277,97 285,41		ns
Fall time	t_{f}					25 125 150		77,6 102,28 108,86		ns
Turn-on energy (per pulse)	E_{on}	Q_{rFWD}=2,77 µC Q_{rFWD}=4,21 µC Q_{rFWD}=4,66 µC				25 125 150		6,13 7,28 7,61		mWs
Turn-off energy (per pulse)	E_{off}					25 125 150		3,52 4,95 5,37		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	
Inverter Diode 2										
Static										
Forward voltage	V_F				25	25 125 150		1,63 1,7 1,69	2,1(2)	V
Reverse leakage current	I_R	V_r = 1200 V				25			35	µA
Thermal										
Thermal resistance junction to sink(3)	$R_{th(j-s)}$	λ_{paste} = 2,5 W/mK (HPTP)						1,26		K/W
Dynamic										
Peak recovery current	I_{RM}	d*i*/d*t*=348 A/µs d*i*/d*t*=328 A/µs d*i*/d*t*=365 A/µs	±15	600	50	25 125 150		17,26 19,14 19,85		A
Reverse recovery time	t_{rr}					25 125 150		301,89 445,81 486,65		ns
Recovered charge	Q_r					25 125 150		2,77 4,21 4,66		µC
Reverse recovered energy	E_{rec}					25 125 150		0,929 1,57 1,77		mWs
Peak rate of fall of recovery current	$(di_{rf}/dt)_{max}$					25 125 150		129,27 88,5 87,51		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	
Thermistor										
Static										
Rated resistance	R					25		5		kΩ
Deviation of R100	$\Delta_{R/R}$	R_{100} = 499 Ω				100	3,2		3,3	%
Power dissipation	P					25		130		mW
Power dissipation constant	d					25		1,3		mW/K
B-value	$B_{(25/50)}$	Tol. ±1 %						3380		K
Vincotech Thermistor Reference									V	

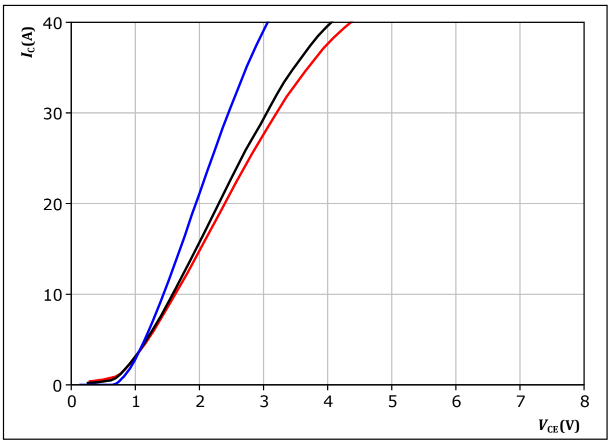
(2) Value at chip level
(3) Only valid with pre-applied Vincotech thermal interface material.

Inverter Switch Characteristics

figure 1. **IGBT**

Typical output characteristics

I_C = f(V_{CE})



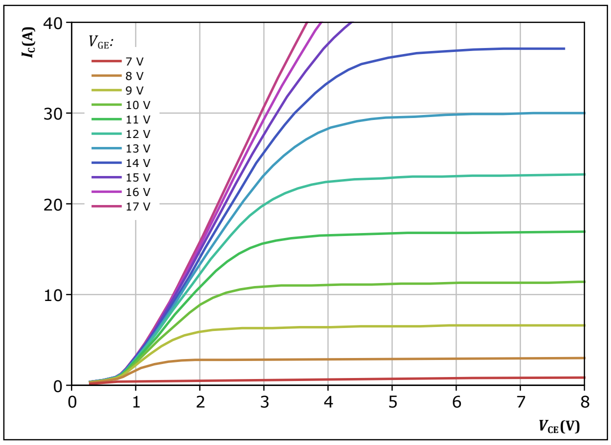
t_p =	250	µs
V_{GE} =	15	V

T_j: 25 °C, 125 °C, 150 °C

figure 2. **IGBT**

Typical output characteristics

I_C = f(V_{CE})



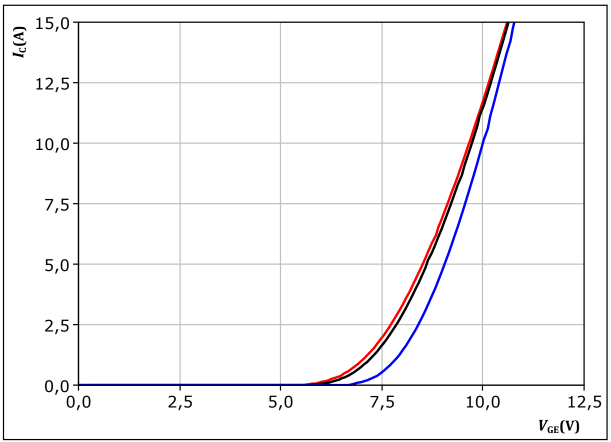
t_p =	250	µs
T_j =	150	°C

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

figure 3. **IGBT**

Typical transfer characteristics

I_C = f(V_{GE})



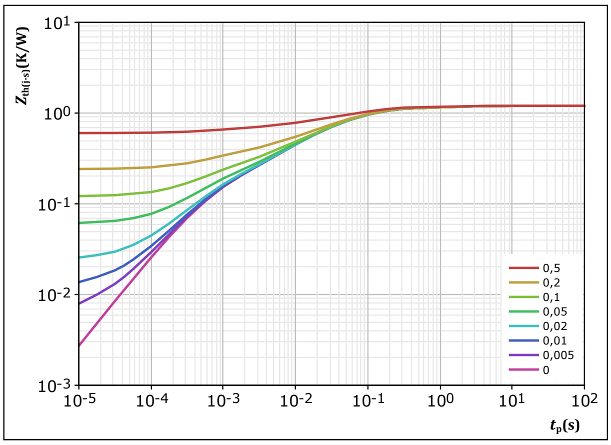
t_p =	250	µs
V_{CE} =	10	V

T_j: 25 °C, 125 °C, 150 °C

figure 4. **IGBT**

Transient thermal impedance as a function of pulse width

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



D =	t_p / T	
$R_{th(j\text{-}s)}$ =	1,203	K/W

IGBT thermal model values

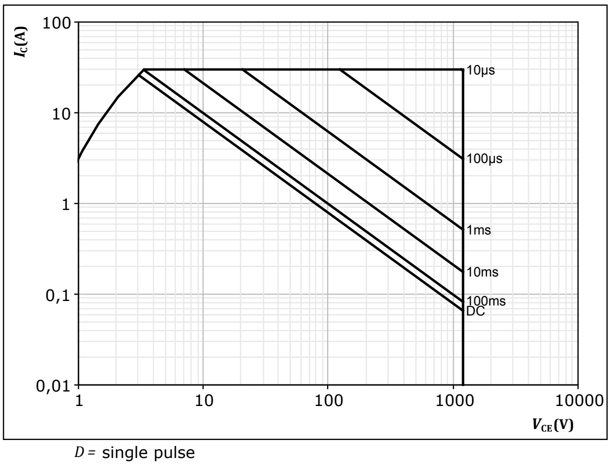
R (K/W)	τ (s)
8,45E-02	1,63E+00
4,66E-01	9,37E-02
3,90E-01	2,02E-02
1,45E-01	3,96E-03
1,16E-01	5,44E-04

Inverter Switch Characteristics

figure 5.	IGBT

Safe operating area

$I_C = f(V_{CE})$

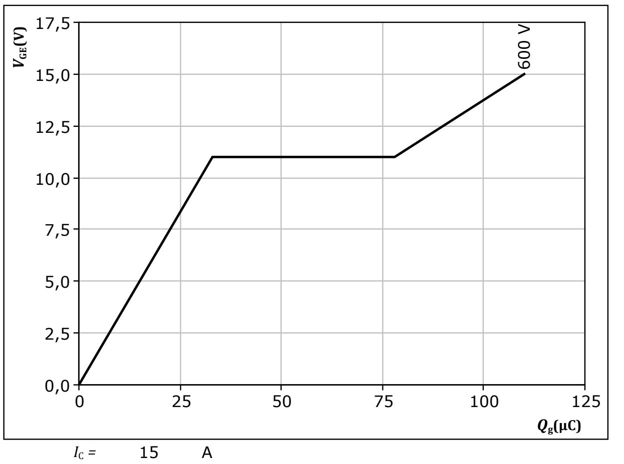


D =	single pulse	
T_s =	80	°C
V_{GE} =	15	V
T_j =	T_{jmax}	

figure 6.	IGBT

Gate voltage vs gate charge

$V_{GE} = f(Q_g)$



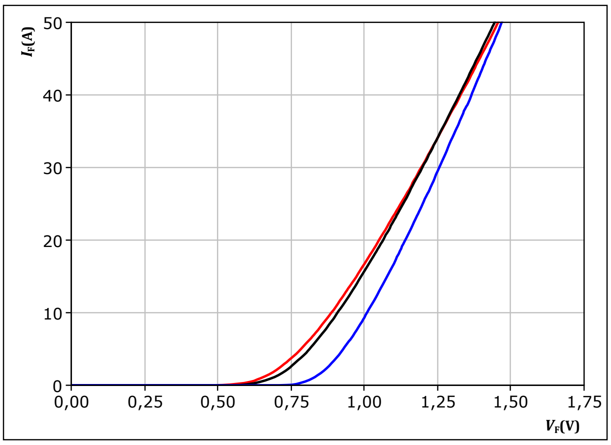
I_C =	15	A
T_j =	25	°C

Inverter Diode Characteristics

figure 7. **Rectifier**

Typical forward characteristics

I_F = f(V_F)



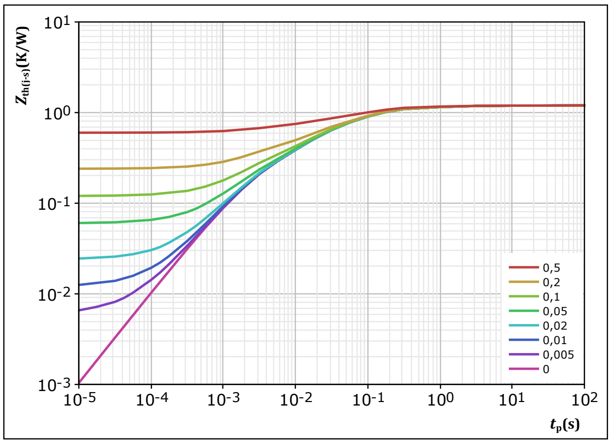
t_p = 250 µs

T_j: 25 °C, 125 °C, 150 °C

figure 8. **Rectifier**

Transient thermal impedance as a function of pulse width

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



D = t_p / T

$R_{th(j-s)}$ = 1,199 K/W

Rectifier thermal model values

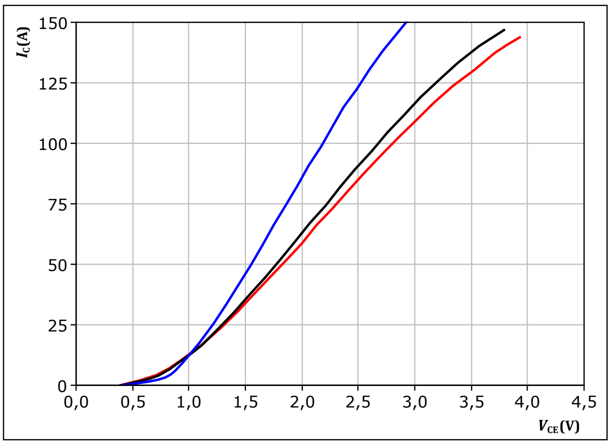
R (K/W)	τ (s)
9,53E-03	3,62E+01
8,81E-02	1,34E+00
5,06E-01	1,09E-01
4,21E-01	1,95E-02
1,75E-01	2,24E-03

Inverter Switch 2 Characteristics

figure 9. IGBT

Typical output characteristics

I_C = f(V_{CE})

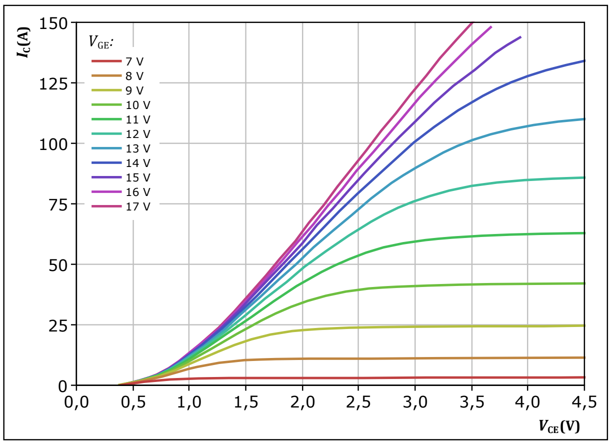


t_p =	250	μs		25 °C
V_{GE} =	15	V	T_j:	125 °C
				150 °C

figure 10. IGBT

Typical output characteristics

I_C = f(V_{CE})



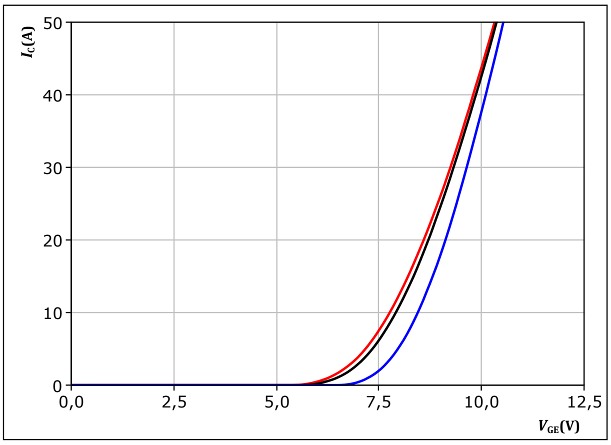
t_p =	250	μs
T_j =	150	°C

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

figure 11. IGBT

Typical transfer characteristics

I_C = f(V_{GE})

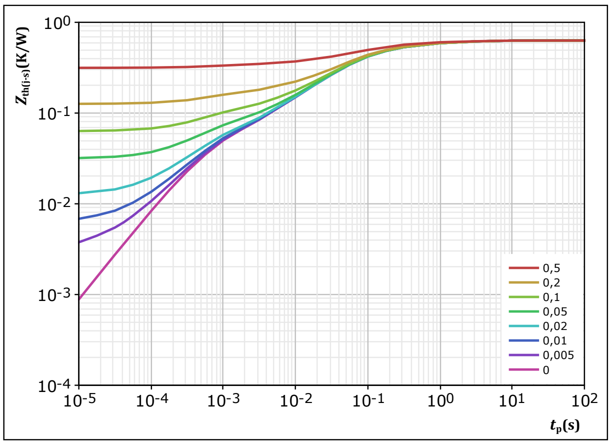


t_p =	250	μs		25 °C
V_{CE} =	10	V	T_j:	125 °C
				150 °C

figure 12. IGBT

Transient thermal impedance as a function of pulse width

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



D =	t_p / T	
$R_{th(j-s)}$ =	0,63	K/W

IGBT thermal model values

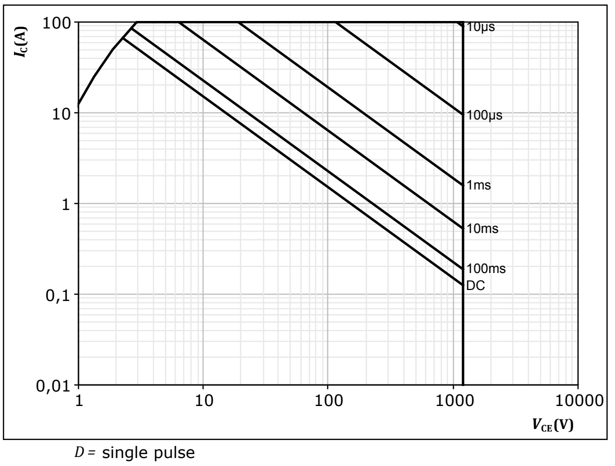
R (K/W)	τ (s)
5,38E-02	2,36E+00
1,33E-01	3,13E-01
3,14E-01	6,13E-02
8,40E-02	1,01E-02
4,51E-02	6,01E-04

Inverter Switch 2 Characteristics

figure 13. **IGBT**

Safe operating area

I_C = f(V_{CE})

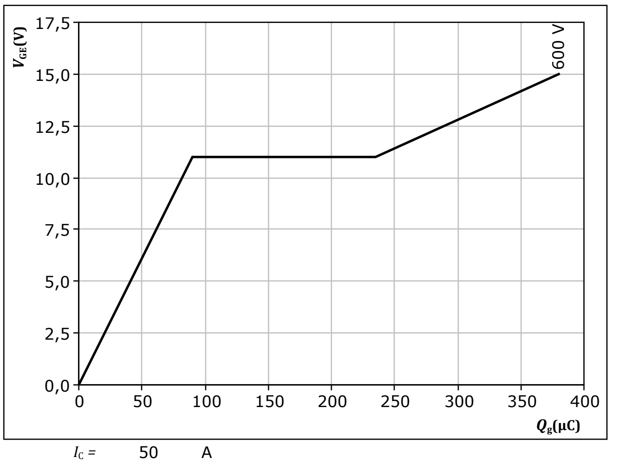


D = single pulse
T_s = 80 °C
V_{GE} = 15 V
T_j = T_{jmax}

figure 14. **IGBT**

Gate voltage vs gate charge

V_{GE} = f(Q_g)



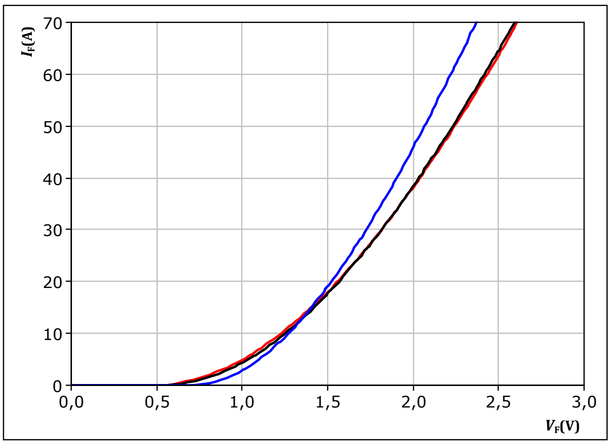
I_C = 50 A
T_j = 25 °C

Inverter Diode 2 Characteristics

figure 15. FWD

Typical forward characteristics

I_F = f(V_F)



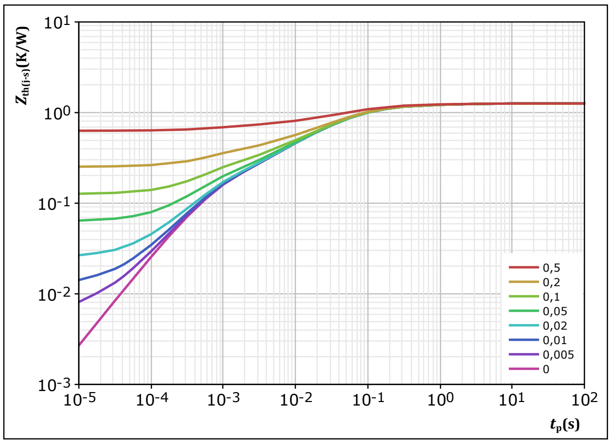
t_p = 250 µs

T_j: 25 °C, 125 °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

$R_{th(j-s)}$ = 1,26 K/W

FWD thermal model values

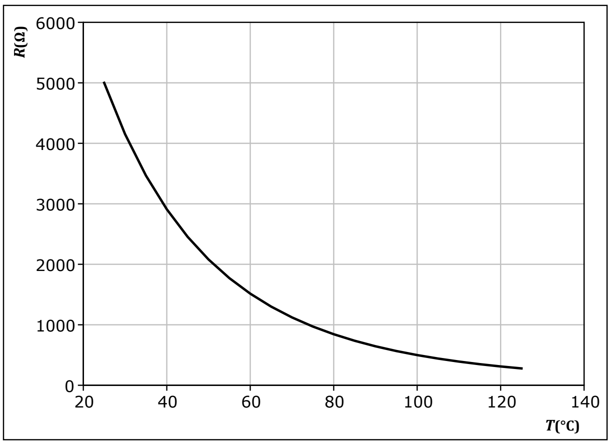
R (K/W)	τ (s)
7,18E-02	1,82E+00
2,80E-01	1,58E-01
5,13E-01	3,97E-02
2,46E-01	7,61E-03
1,49E-01	6,66E-04

Thermistor Characteristics

figure 17.	Thermistor

Typical NTC characteristic as function of temperature

R_T = f(T)

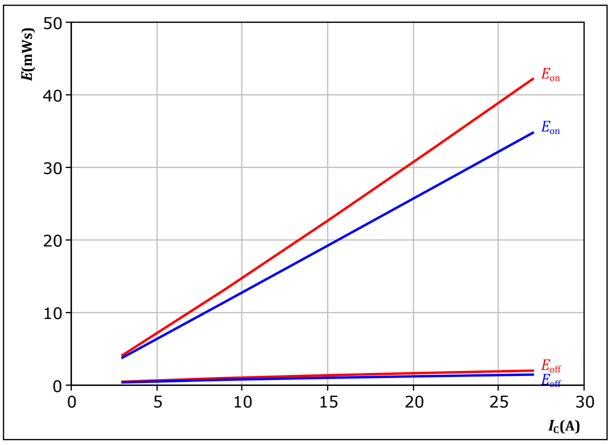


Inverter Switching Characteristics

figure 18. **IGBT**

Typical switching energy losses as a function of collector current

$E = f(I_C)$



With an inductive load at

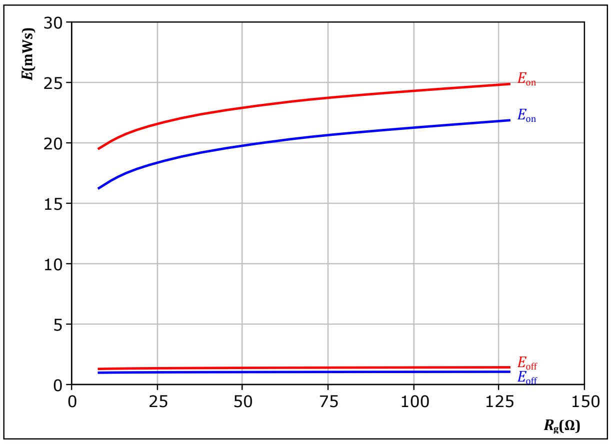
V_{CE} =	600	V
V_{GE} =	±15	V
R_{gon} =	32	Ω
R_{goff} =	32	Ω

T_j: 25 °C (blue), 125 °C (red)

figure 19. **IGBT**

Typical switching energy losses as a function of IGBT turn on gate resistor

$E = f(R_g)$



With an inductive load at

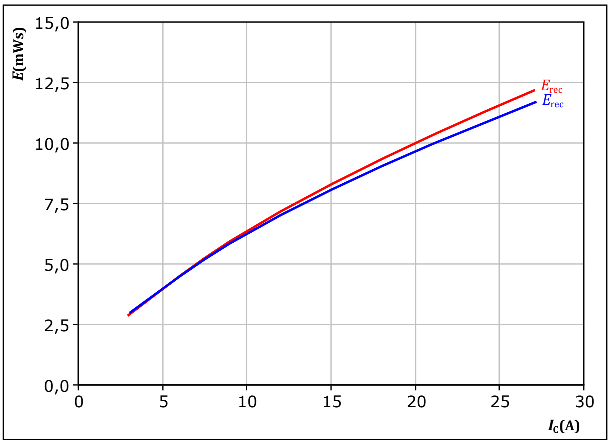
V_{CE} =	600	V
V_{GE} =	±15	V
I_C =	15	A

T_j: 25 °C (blue), 125 °C (red)

figure 20. **Rectifier**

Typical reverse recovered energy loss as a function of collector current

$E_{rec} = f(I_C)$



With an inductive load at

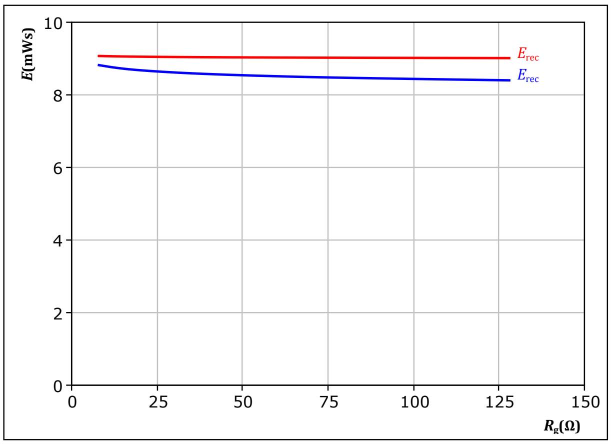
V_{CE} =	600	V
V_{GE} =	±15	V
R_{gon} =	32	Ω

T_j: 25 °C (blue), 125 °C (red)

figure 21. **Rectifier**

Typical reverse recovered energy loss as a function of IGBT turn on gate resistor

$E_{rec} = f(R_g)$



With an inductive load at

V_{CE} =	600	V
V_{GE} =	±15	V
I_C =	15	A

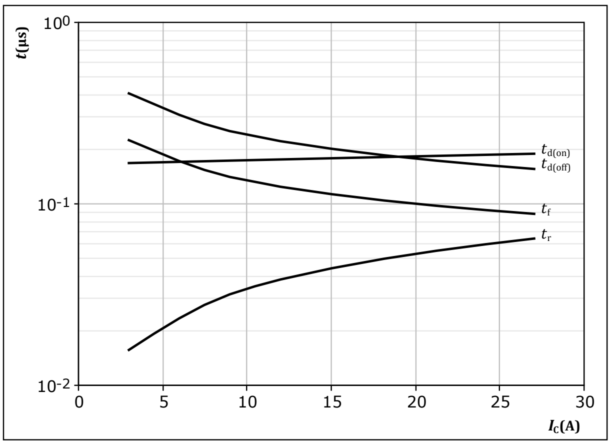
T_j: 25 °C (blue), 125 °C (red)

Inverter Switching Characteristics

figure 22. **IGBT**

Typical switching times as a function of collector current

$t = f(I_C)$



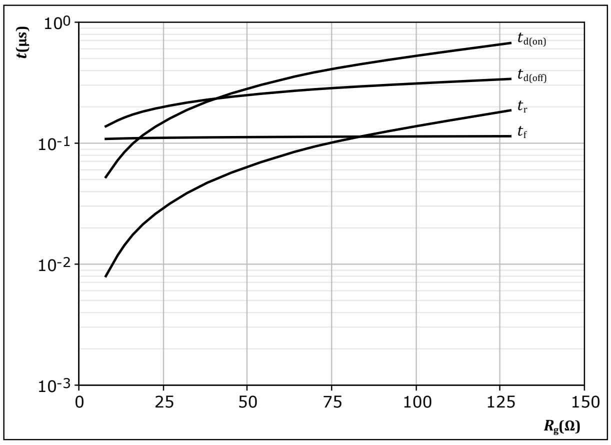
With an inductive load at

T_j =	125	°C
V_{CE} =	600	V
V_{GE} =	±15	V
R_{gon} =	32	Ω
R_{goff} =	32	Ω

figure 23. **IGBT**

Typical switching times as a function of IGBT turn on gate resistor

$t = f(R_g)$



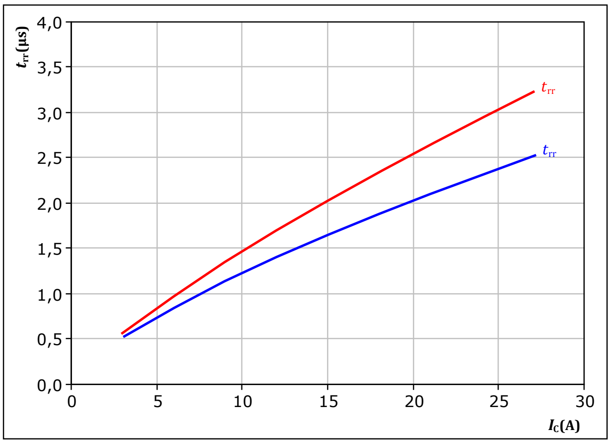
With an inductive load at

T_j =	125	°C
V_{CE} =	600	V
V_{GE} =	±15	V
I_C =	15	A

figure 24. **Rectifier**

Typical reverse recovery time as a function of collector current

$t_{rr} = f(I_C)$



With an inductive load at

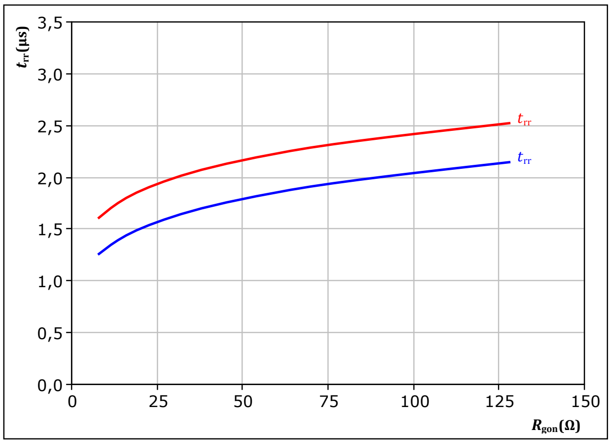
V_{CE} =	600	V
V_{GE} =	±15	V
R_{gon} =	32	Ω

T_j: 25 °C, 125 °C

figure 25. **Rectifier**

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} =	600	V
V_{GE} =	±15	V
I_C =	15	A

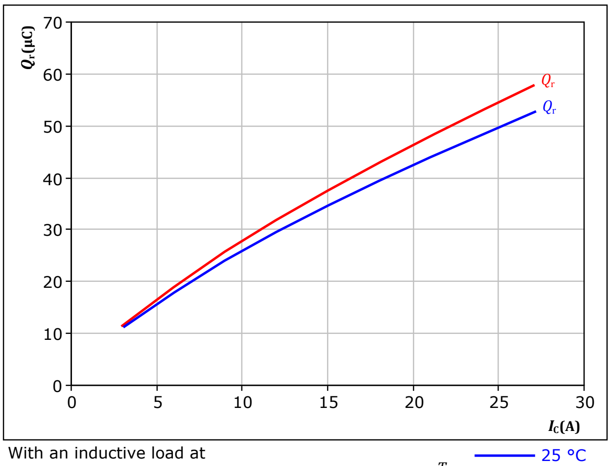
T_j: 25 °C, 125 °C

Inverter Switching Characteristics

figure 26.	Rectifier

Typical recovered charge as a function of collector current

Q_r = f(I_C)



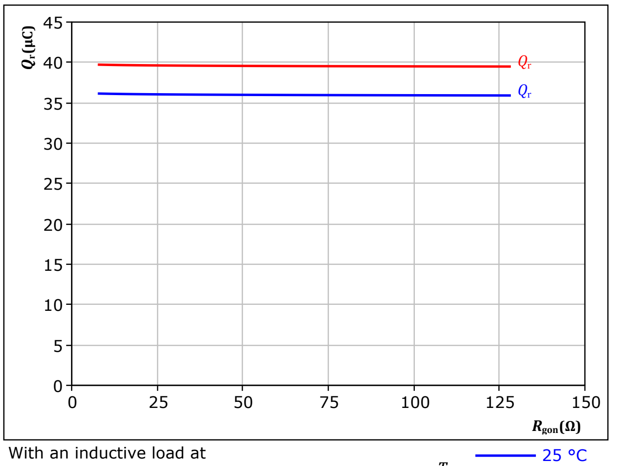
With an inductive load at

V_{CE} =	600	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
R_{gon} =	32	Ω		

figure 27.	Rectifier

Typical recovered charge as a function of IGBT turn on gate resistor

Q_r = f(R_{gon})



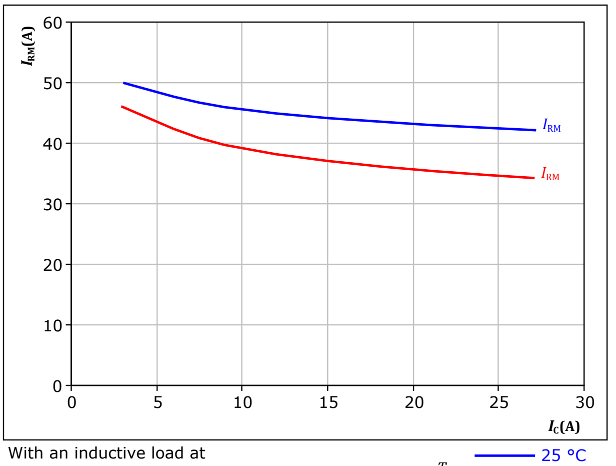
With an inductive load at

V_{CE} =	600	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
I_C =	15	A		

figure 28.	Rectifier

Typical peak reverse recovery current as a function of collector current

I_{RM} = f(I_C)



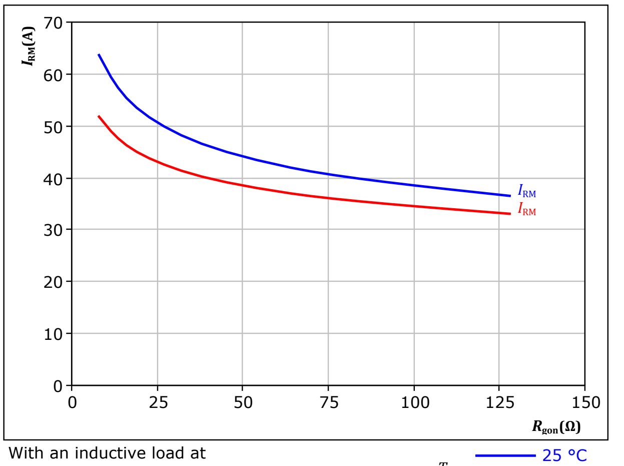
With an inductive load at

V_{CE} =	600	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
R_{gon} =	32	Ω		

figure 29.	Rectifier

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

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



With an inductive load at

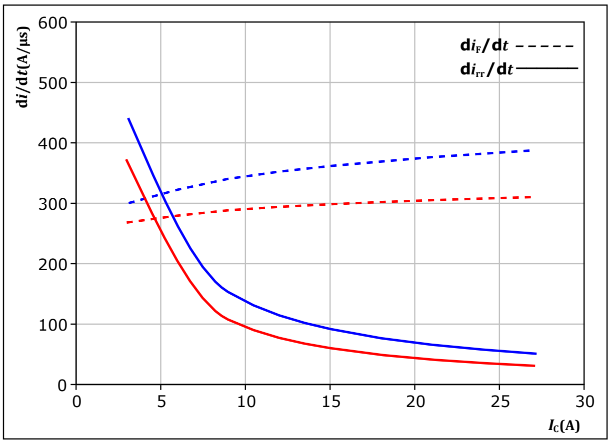
V_{CE} =	600	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
I_C =	15	A		

Inverter Switching Characteristics

figure 30. **Rectifier**

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

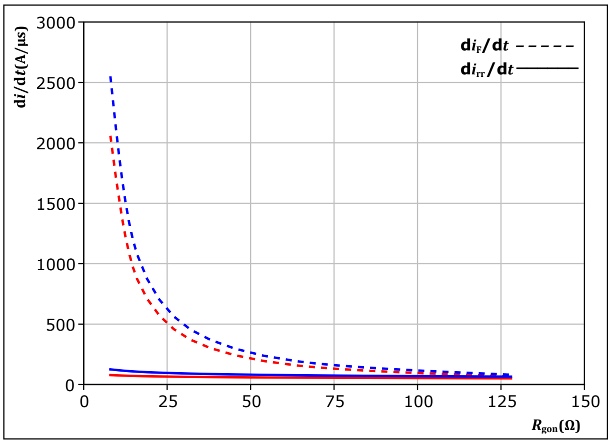
T_j: 25 °C / 125 °C

V_{CE} =	600	V
V_{GE} =	±15	V
R_{gon} =	32	Ω

figure 31. **Rectifier**

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

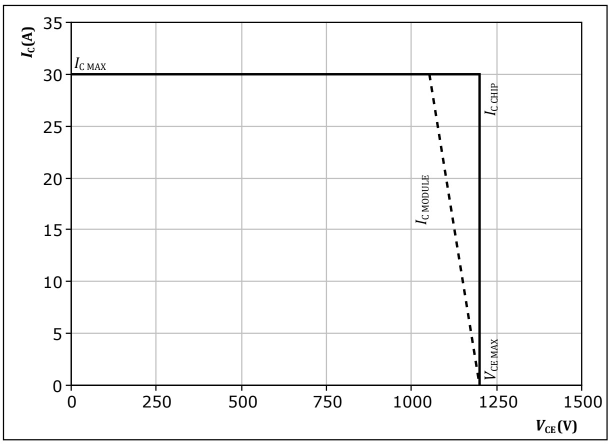
T_j: 25 °C / 125 °C

V_{CE} =	600	V
V_{GE} =	±15	V
I_C =	15	A

figure 32. **IGBT**

Reverse bias safe operating area

I_C = f(V_{CE})



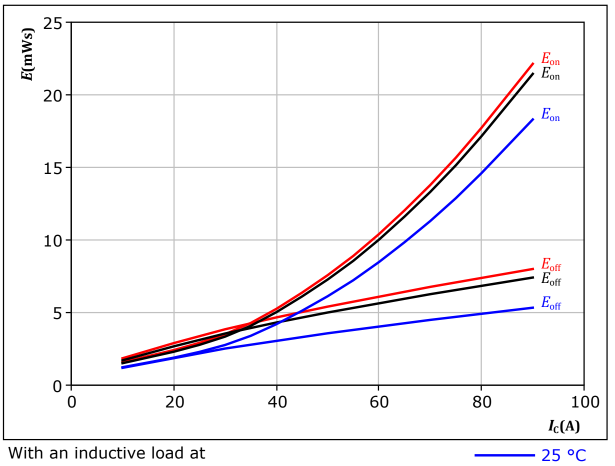
At			
	T_j =	125	°C
	R_{gon} =	32	Ω
	R_{goff} =	32	Ω

Inverter Switching Characteristics 2

figure 33. **IGBT**

Typical switching energy losses as a function of collector current

$E = f(I_C)$



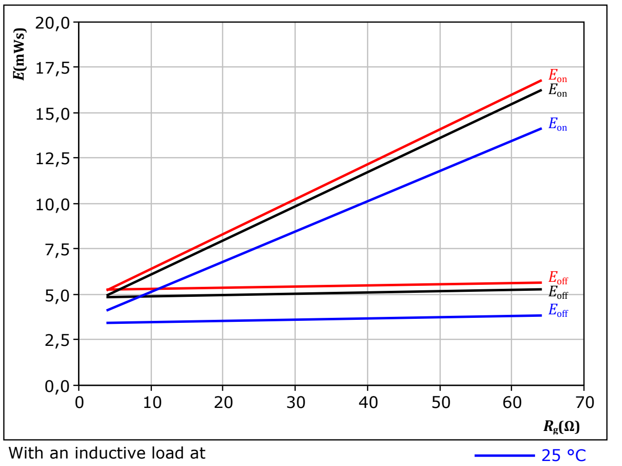
With an inductive load at

V_{CE} =	600	V	T_j:	25 °C / 125 °C / 150 °C
V_{GE} =	±15	V		
R_{gon} =	16	Ω		
R_{goff} =	16	Ω		

figure 34. **IGBT**

Typical switching energy losses as a function of IGBT turn on gate resistor

$E = f(R_g)$



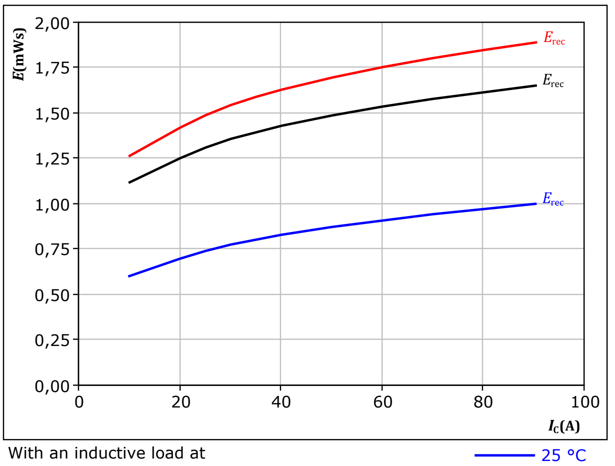
With an inductive load at

V_{CE} =	600	V	T_j:	25 °C / 125 °C / 150 °C
V_{GE} =	±15	V		
I_C =	50	A		

figure 35. **FWD**

Typical reverse recovered energy loss as a function of collector current

$E_{rec} = f(I_C)$



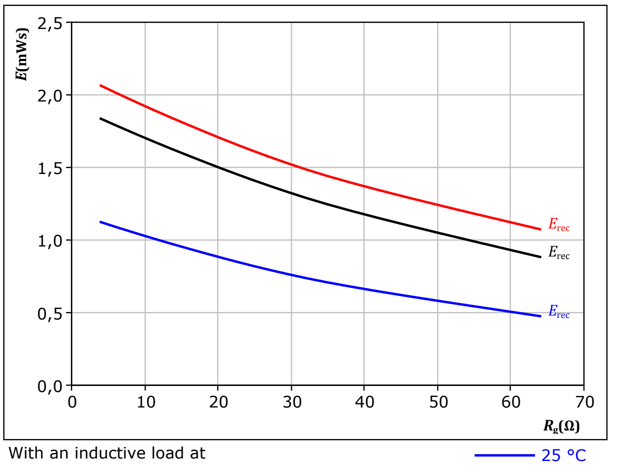
With an inductive load at

V_{CE} =	600	V	T_j:	25 °C / 125 °C / 150 °C
V_{GE} =	±15	V		
R_{gon} =	16	Ω		

figure 36. **FWD**

Typical reverse recovered energy loss as a function of IGBT turn on gate resistor

$E_{rec} = f(R_g)$



With an inductive load at

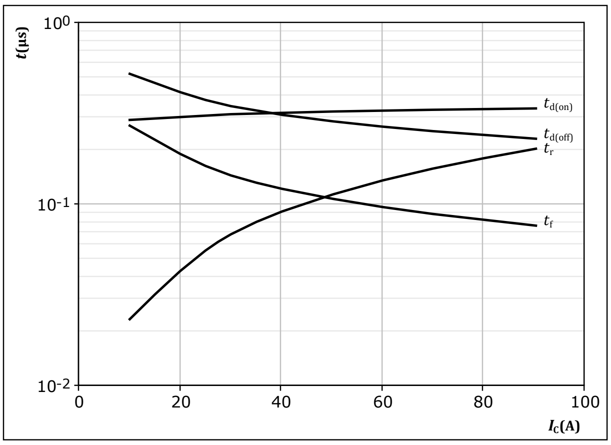
V_{CE} =	600	V	T_j:	25 °C / 125 °C / 150 °C
V_{GE} =	±15	V		
I_C =	50	A		

Inverter Switching Characteristics 2

figure 37. **IGBT**

Typical switching times as a function of collector current

$t = f(I_C)$



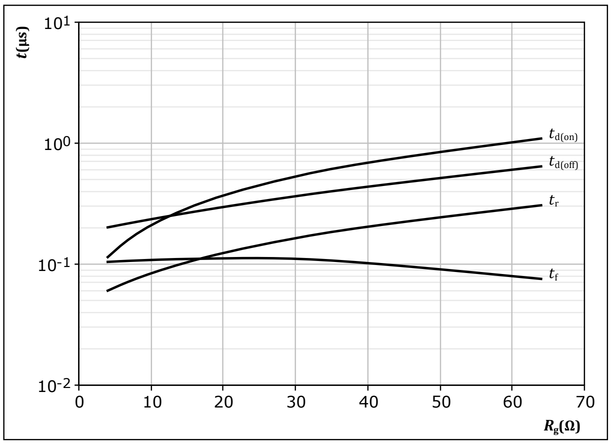
With an inductive load at

T_j =	150	°C
V_{CE} =	600	V
V_{GE} =	±15	V
R_{gon} =	16	Ω
R_{goff} =	16	Ω

figure 38. **IGBT**

Typical switching times as a function of IGBT turn on gate resistor

$t = f(R_g)$



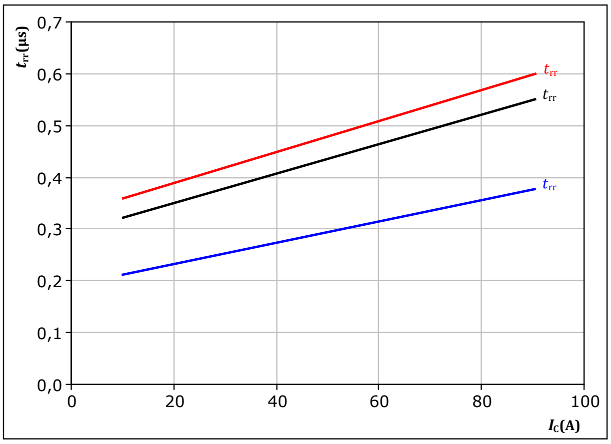
With an inductive load at

T_j =	150	°C
V_{CE} =	600	V
V_{GE} =	±15	V
I_C =	50	A

figure 39. **FWD**

Typical reverse recovery time as a function of collector current

$t_{rr} = f(I_C)$



With an inductive load at

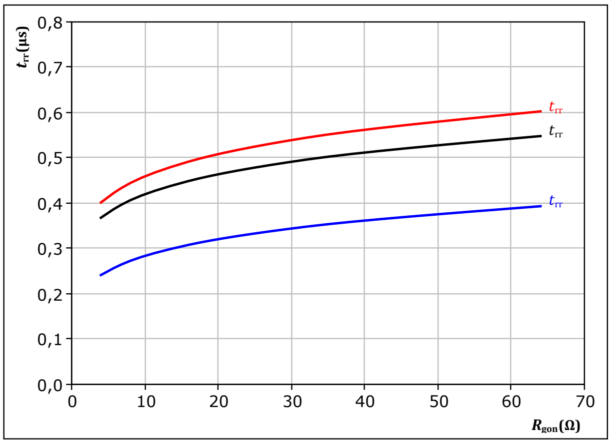
V_{CE} =	600	V
V_{GE} =	±15	V
R_{gon} =	16	Ω

T_j: 25 °C, 125 °C, 150 °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} =	600	V
V_{GE} =	±15	V
I_C =	50	A

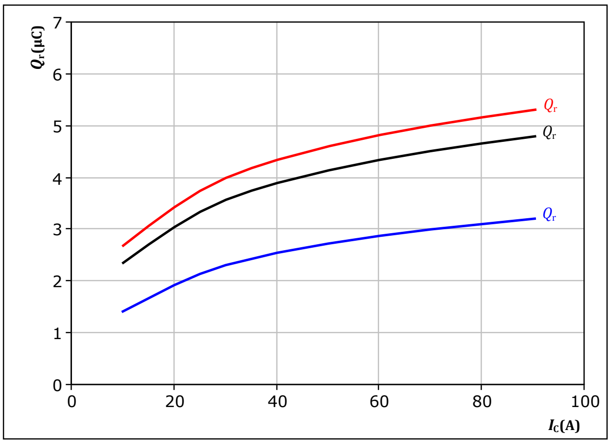
T_j: 25 °C, 125 °C, 150 °C

Inverter Switching Characteristics 2

figure 41. FWD

Typical recovered charge as a function of collector current

Q_r = f(I_C)



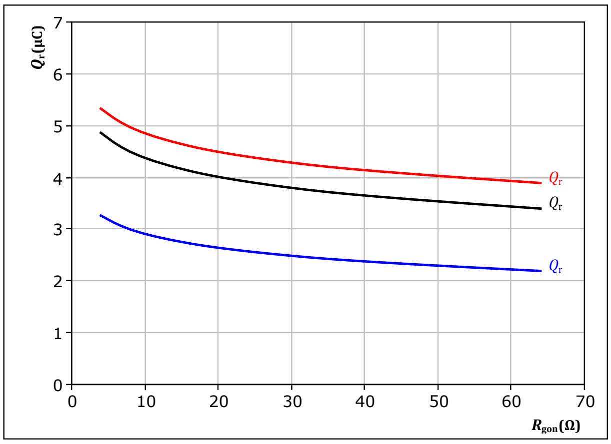
With an inductive load at

V_{CE} =	600	V	T_j:	25 °C / 125 °C / 150 °C
V_{GE} =	±15	V		
R_{gon} =	16	Ω		

figure 42. FWD

Typical recovered charge as a function of IGBT turn on gate resistor

Q_r = f(R_{gon})



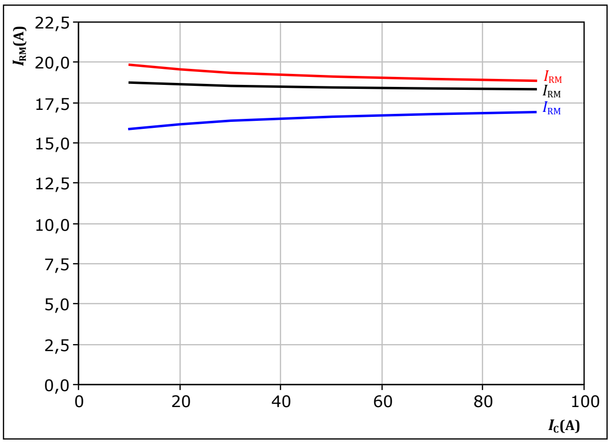
With an inductive load at

V_{CE} =	600	V	T_j:	25 °C / 125 °C / 150 °C
V_{GE} =	±15	V		
I_C =	50	A		

figure 43. FWD

Typical peak reverse recovery current as a function of collector current

I_{RM} = f(I_C)



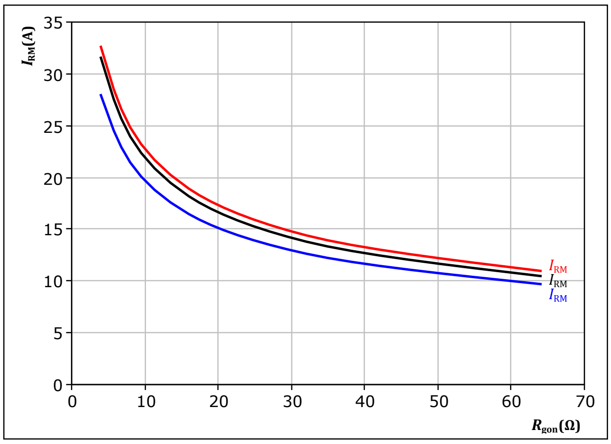
With an inductive load at

V_{CE} =	600	V	T_j:	25 °C / 125 °C / 150 °C
V_{GE} =	±15	V		
R_{gon} =	16	Ω		

figure 44. FWD

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

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



With an inductive load at

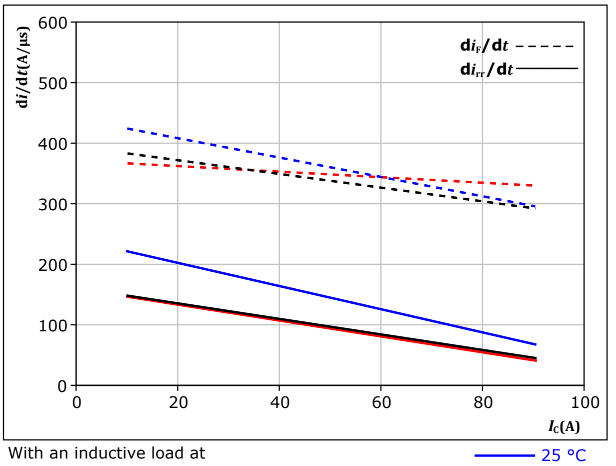
V_{CE} =	600	V	T_j:	25 °C / 125 °C / 150 °C
V_{GE} =	±15	V		
I_C =	50	A		

Inverter Switching Characteristics 2

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)



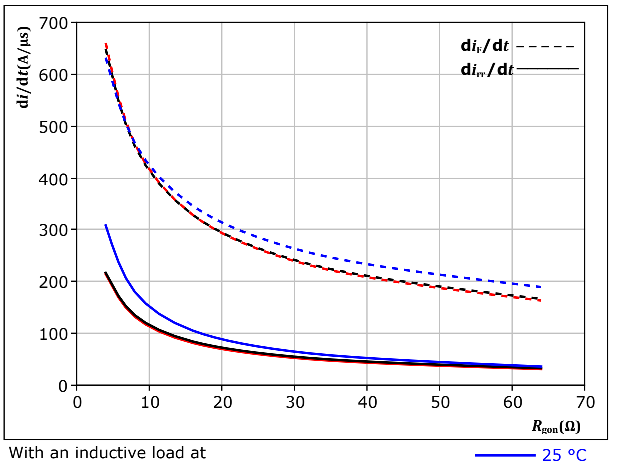
With an inductive load at

V_{CE} =	600	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
R_{gon} =	16	Ω		150 °C

figure 46. **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})



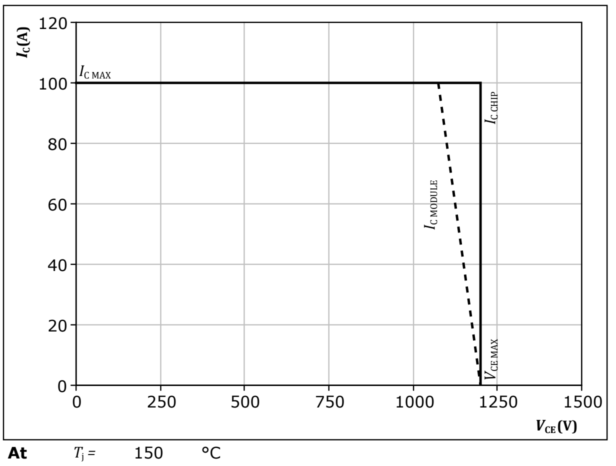
With an inductive load at

V_{CE} =	600	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
I_C =	50	A		150 °C

figure 47. **IGBT**

Reverse bias safe operating area

I_C = f(V_{CE})



At	T_j =	150	°C
	R_{gon} =	16	Ω
	R_{goff} =	16	Ω

Switching Definitions

figure 48. **IGBT**

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

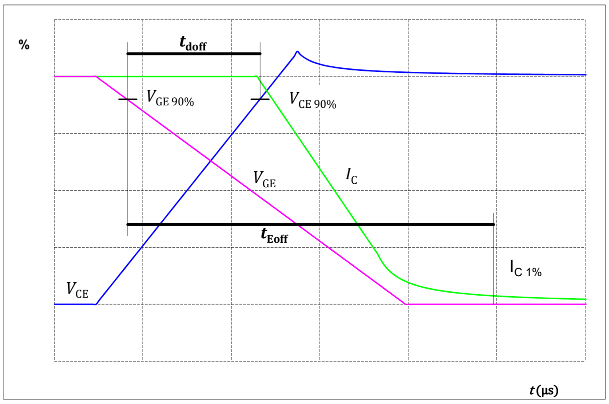


figure 49. **IGBT**

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

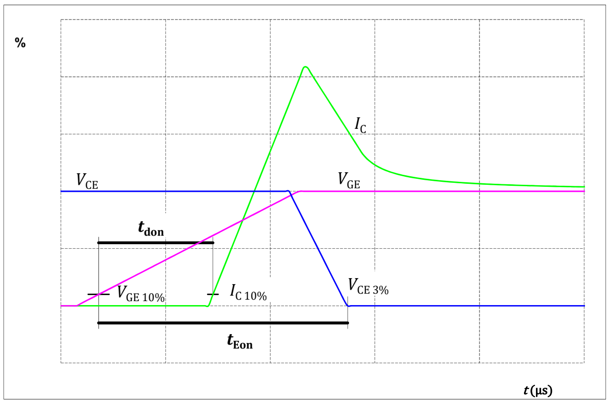


figure 50. **IGBT**

Turn-off Switching Waveforms & definition of t_f

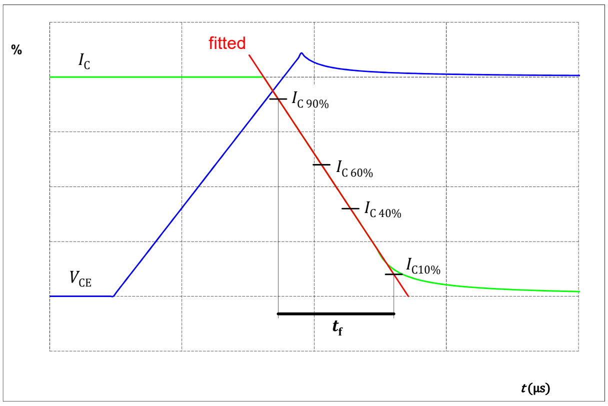
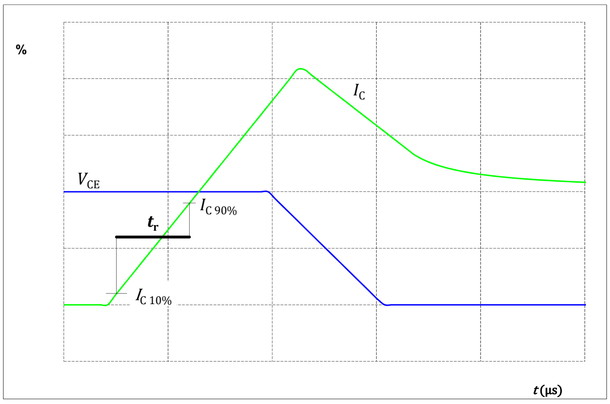


figure 51. **IGBT**

Turn-on Switching Waveforms & definition of t_r



Switching Definitions

figure 52.	FWD

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

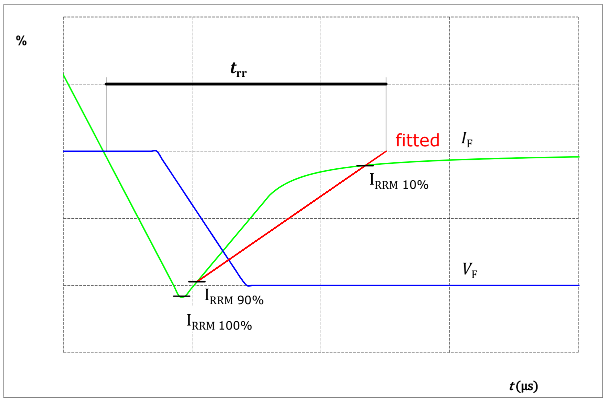
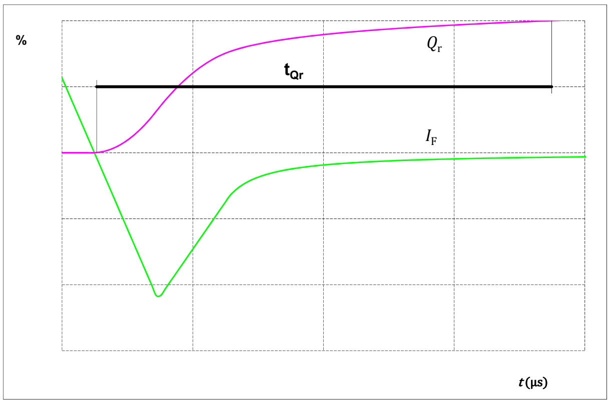


figure 53.	FWD

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



80-M212WPA050M701-K750F71
datasheet

Vincotech

Ordering Code

Version	Ordering Code
With std lid (6.5mm height) + no thermal grease	80-M212WPA050M701-K750F71-/0A/
With thin lid (2.8mm height) + no thermal grease	80-M212WPA050M701-K750F71-/0B/
With std lid (6.5mm height) + thermal grease (0,8 W/mK, P12, silicone-based)	80-M212WPA050M701-K750F71-/1A/
With thin lid (2.8mm height) + thermal grease (0,8 W/mK, P12, silicone-based)	80-M212WPA050M701-K750F71-/1B/
With std lid (6.5mm height) + thermal grease (2,5 W/mK, TG20032, silicone-free)	80-M212WPA050M701-K750F71-/4A/
With thin lid (2.8mm height) + thermal grease (2,5 W/mK, TG20032, silicone-free)	80-M212WPA050M701-K750F71-/4B/
With std lid (6.5mm height) + thermal grease (2,5 W/mK, HPTP, silicone-based)	80-M212WPA050M701-K750F71-/5A/
With thin lid (2.8mm height) + thermal grease (2,5 W/mK, HPTP, silicone-based)	80-M212WPA050M701-K750F71-/5B/

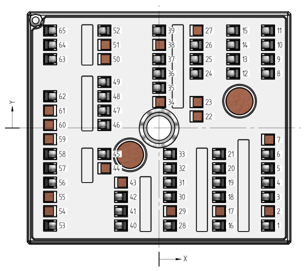
Marking

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

Outline

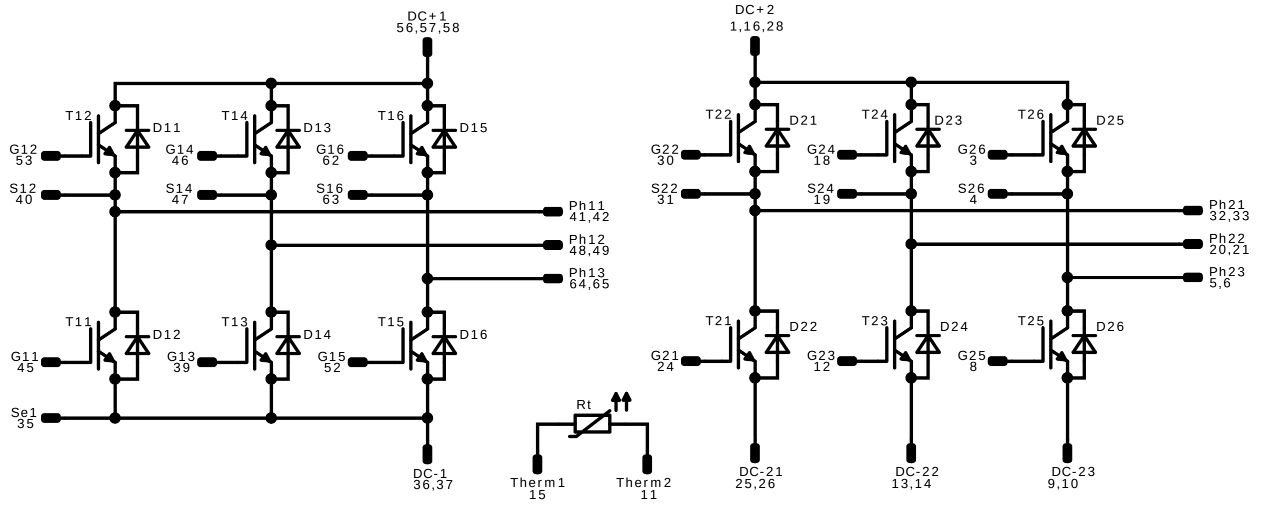
Pin table [mm]

Pin	X	Y	Function	Pin	X	Y	Function
1	24,38	-21,8	DC+2	34	not assembled		
2	not assembled			35	0,03	9	Se1
3	24,38	-15,4	G26	36	0,03	12,2	DC-1
4	24,38	-12,2	S26	37	0,03	15,4	DC-1
5	24,38	-9	Ph23	38	not assembled		
6	24,38	-5,8	Ph23	39	0,03	21,8	G13
7	not assembled			40	-8,5	-21,8	S12
8	24,38	12,2	G25	41	-8,5	-18,6	Ph11
9	24,38	15,4	DC-23	42	-8,5	-15,4	Ph11
10	24,38	18,6	DC-23	43	not assembled		
11	24,38	21,8	Therm2	44	not assembled		
12	16,58	12,2	G23	45	-12,22	-5,8	G11
13	16,58	15,4	DC-22	46	-12,22	0,7	G14
14	16,58	18,6	DC-22	47	-12,22	3,9	S14
15	16,58	21,8	Therm1	48	-12,22	7,1	Ph12
16	13,42	-21,8	DC+2	49	-12,22	10,3	Ph12
17	not assembled			50	not assembled		
18	13,42	-15,4	G24	51	not assembled		
19	13,42	-12,2	S24	52	-12,22	21,8	G15
20	13,42	-9	Ph22	53	-24,38	-21,8	G12
21	13,42	-5,8	Ph22	54	not assembled		
22	not assembled			55	not assembled		
23	not assembled			56	-24,38	-12,2	DC+1
24	8,38	12,2	G21	57	-24,38	-9	DC+1
25	8,38	15,4	DC-21	58	-24,38	-5,8	DC+1
26	8,38	18,6	DC-21	59	not assembled		
27	not assembled			60	not assembled		
28	2,46	-21,8	DC+2	61	not assembled		
29	not assembled			62	-24,38	7,1	G16
30	2,46	-15,4	G22	63	-24,38	15,4	S16
31	2,46	-12,2	S22	64	-24,38	18,6	Ph13
32	2,46	-9	Ph21	65	-24,38	21,8	Ph13
33	2,46	-5,8	Ph21				



Pad positions refers to center point. For more informations on pad design please see package data

Pinout



Identification

ID	Component	Voltage	Current	Function	Comment
T11, T12, T13, T14, T15, T16	IGBT	1200 V	15 A	Inverter Switch	
D11, D12, D13, D14, D15, D16	Rectifier	1600 V	18 A	Inverter Diode	
T21, T22, T23, T24, T25, T26	IGBT	1200 V	50 A	Inverter Switch 2	
D21, D22, D23, D24, D25, D26	FWD	1200 V	25 A	Inverter Diode 2	
Rt	Thermistor			Thermistor	

Packaging instruction				
Standard packaging quantity (SPQ) 72	>SPQ	Standard	<SPQ	Sample

Handling instruction
Handling instructions for MiniSKiiP® 2 packages see vincotech.com website.

Package data
Package data for MiniSKiiP® 2 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
80-M212WPA050M701-K750F71-D1-14	23 Nov. 2022		