A0-VP12PMA100RA-LF17A80T

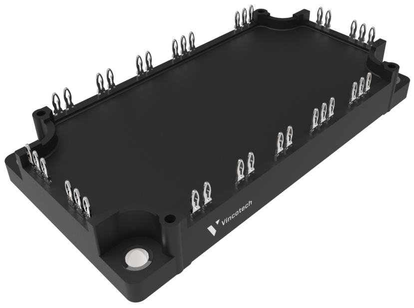
datasheet

VINcoPIM E3 **1200 V / 100 A**

Topology features

- Common Emitter configuration
- Converter+Brake+Inverter
- Temperature sensor

VINco E3s 17 mm housing



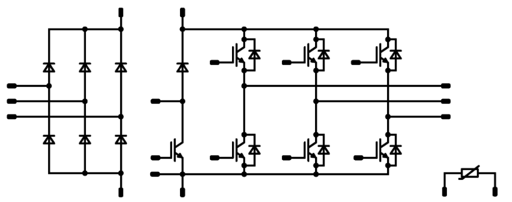
Component features

- Easy paralleling
- Low collector emitter saturation voltage
- Low turn-off losses

Housing features

- Base isolation: IMB
- SoLid Cover Technology
- Standard mid-power industry package
- Driver pins are avaliable in press-fit and solder pin
- M6 High Power Screw Contact
- Reliable cold welding connection to PCB
- Press-fit terminals

Schematic



Target applications

- Elevator Drives
- General Purpose Drives
- Industrial Drives
- Servo Drives

Types

- A0-VP12PMA100RA-LF17A80T

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	131	A
Repetitive peak collector current	I_{CRM}	t_p limited by T_{jmax}	300	A
Turn off safe operating area		T_j = 150°C, V_{CE} = 1200 V	300	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ T_s = 80 °C	278	W
Gate-emitter voltage	V_{GES}		±30	V
Short circuit ratings	t_{SC}	V_{GE} = 15 V, V_{CC} = 800 V T_j = 150 °C	8	µs
Maximum junction temperature	T_{jmax}		175	°C
Inverter Diode				
Peak repetitive reverse voltage	V_{RRM}		1200	V
Forward current (DC current)	I_F	$T_j = T_{jmax}$ T_s = 80 °C	96	A
Repetitive peak forward current	I_{FRM}	t_p limited by T_{jmax}	300	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ T_s = 80 °C	208	W
Maximum junction temperature	T_{jmax}		175	°C
Brake Switch				
Collector-emitter voltage	V_{CES}		1200	V
Collector current (DC current)	I_C	$T_j = T_{jmax}$ T_s = 80 °C	109	A
Repetitive peak collector current	I_{CRM}	t_p limited by T_{jmax}	225	A
Turn off safe operating area		T_j = 150°C, V_{CE} = 1200 V	225	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ T_s = 80 °C	223	W
Gate-emitter voltage	V_{GES}		±30	V
Short circuit ratings	t_{SC}	V_{GE} = 15 V, V_{CC} = 800 V T_j = 150 °C	8	µs
Maximum junction temperature	T_{jmax}		175	°C

Maximum Ratings

T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Conditions		Value	Unit
Brake Diode					
Peak repetitive reverse voltage	V_{RRM}			1200	V
Forward current (DC current)	I_F	$T_j = T_{jmax}$	T_s = 80 °C	57	A
Repetitive peak forward current	I_{FRM}	t_p limited by T_{jmax}		120	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$	T_s = 80 °C	122	W
Maximum junction temperature	T_{jmax}			175	°C
Rectifier Diode					
Peak repetitive reverse voltage	V_{RRM}			1600	V
Forward current (DC current)	I_F	$T_j = T_{jmax}$	T_s = 80 °C	141	A
Surge (non-repetitive) forward current	I_{FSM}	Single Half Sine Wave, t_p = 10 ms	T_j = 150 °C	890	A
Surge current capability	I^2t			3960	A^2s
Total power dissipation	P_{tot}	$T_j = T_{jmax}$	T_s = 80 °C	176	W
Maximum junction temperature	T_{jmax}			150	°C
Module Properties					
Thermal Properties					
Storage temperature	T_{stg}			-40…+125	°C
Operation temperature under switching condition	T_{jop}			-40…+(T_{jmax} - 25)	°C
Isolation Properties					
Isolation voltage	V_{isol}	DC Test Voltage*	t_p = 2 s	6000	V
Creepage distance				>12,7	mm
Clearance				9	mm
Comparative Tracking Index	CTI			≥ 200	

*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	$V_{GE(th)}$			5	0,0117	25	5,5	6,3	7,1	V
Collector-emitter saturation voltage	V_{CEsat}		15		100	25 125 150		1,48 1,73 1,79	1,95(1)	V
Collector-emitter cut-off current	I_{CES}		0	1200		25			10	µA
Gate-emitter leakage current	I_{GES}		30	0		25			500	nA
Internal gate resistance	r_g							None		Ω
Input capacitance	C_{ies}	f = 1 Mhz	0	30		25		16720		pF
Output capacitance	C_{oes}							380		pF
Reverse transfer capacitance	C_{res}							140		pF
Gate charge	Q_g		0/15	600	100	25		605		nC
Thermal										
Thermal resistance junction to sink(2)	$R_{th(j-s)}$	λ_{paste} = 5,2 W/mK (PTM)						0,34		K/W
Dynamic										
Turn-on delay time	$t_{d(on)}$	R_{gon} = 4 Ω R_{goff} = 4 Ω	±15	600	100	25 125 150		157,36 158,64 159,12		ns
Rise time	t_r					25 125 150		27,29 32,71 33,93		ns
Turn-off delay time	$t_{d(off)}$					25 125 150		188,29 212,72 219,66		ns
Fall time	t_f					25 125 150		115,5 140,73 148,5		ns
Turn-on energy (per pulse)	E_{on}	Q_{rFWD}=7,44 µC Q_{rFWD}=13,19 µC Q_{rFWD}=15,16 µC				25 125 150		5,14 7,65 8,62		mWs
Turn-off energy (per pulse)	E_{off}					25 125 150		8,42 11,01 11,57		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				100	25 125 150		1,81 2,09 2,12	2,1[1]	V
Reverse leakage current	I_R	V_r = 1200 V				25			10	µA
Thermal										
Thermal resistance junction to sink[2]	$R_{th(j-s)}$	λ_{paste} = 5,2 W/mK (PTM)						0,46		K/W
Dynamic										
Peak recovery current	I_{RM}	di/dt=3340 A/µs di/dt=3040 A/µs di/dt=2905 A/µs	±15	600	100	25 125 150		110,74 118,79 119,58		A
Reverse recovery time	t_{rr}					25 125 150		323,48 493,2 557,36		ns
Recovered charge	Q_r					25 125 150		7,44 13,19 15,16		µC
Reverse recovered energy	E_{rec}					25 125 150		2,91 5,36 6,15		mWs
Peak rate of fall of recovery current	$(di_{rf}/dt)_{max}$					25 125 150		3817,49 2318,69 1904,16		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	
Brake Switch										
Static										
Gate-emitter threshold voltage	$V_{GE(th)}$			5	0,0093	25	5,5	6,3	7,1	V
Collector-emitter saturation voltage	V_{CEsat}		15		75	25 125 150		1,45 1,62 1,66	1,95(1)	V
Collector-emitter cut-off current	I_{CES}		0	1200		25			10	µA
Gate-emitter leakage current	I_{GES}		30	0		25			500	nA
Internal gate resistance	r_g							None		Ω
Input capacitance	C_{ies}	f = 1 Mhz	0	30		25		12541		pF
Output capacitance	C_{oes}							285		pF
Reverse transfer capacitance	C_{res}							104		pF
Gate charge	Q_g		0/15	600	75	25		456		nC
Thermal										
Thermal resistance junction to sink(2)	$R_{th(j-s)}$	λ_{paste} = 5,2 W/mK (PTM)						0,43		K/W
Dynamic										
Turn-on delay time	$t_{d(on)}$	R_{gon} = 16 Ω R_{goff} = 16 Ω	0/15	700	75	25 125 150		165,25 160,09 157,63		ns
Rise time	t_r					25 125 150		51,05 64,15 68,37		ns
Turn-off delay time	$t_{d(off)}$					25 125 150		719,28 753,97 764,44		ns
Fall time	t_f					25 125 150		88,11 117,76 124,11		ns
Turn-on energy (per pulse)	E_{on}	Q_{rFWD}=3,57 µC Q_{rFWD}=6,12 µC Q_{rFWD}=7,11 µC				25 125 150		7,49 9,95 10,8		mWs
Turn-off energy (per pulse)	E_{off}					25 125 150		7,78 10,27 10,96		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
Brake Diode										
Static										
Forward voltage	V_F				40	25 125 150		1,61 1,79 1,78	2,1(1)	V
Reverse leakage current	I_R	V_r = 1200 V				25			10	µA
Thermal										
Thermal resistance junction to sink(2)	$R_{th(j-s)}$	λ_{paste} = 5,2 W/mK (PTM)						0,78		K/W
Dynamic										
Peak recovery current	I_{RM}	di/dt=1088 A/µs di/dt=1015 A/µs di/dt=970 A/µs	0/15	700	75	25 125 150		38,41 36,54 36,94		A
Reverse recovery time	t_{rr}					25 125 150		274,83 446,44 499,37		ns
Recovered charge	Q_r					25 125 150		3,57 6,12 7,11		µC
Reverse recovered energy	E_{rec}					25 125 150		1,3 2,56 3,02		mWs
Peak rate of fall of recovery current	$(di_{rf}/dt)_{max}$					25 125 150		427,3 202,72 170,64		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]	Values Min	Typ	Max	Unit
Rectifier Diode										
Static										
Forward voltage	V_F				60	25 125 150		1,06 0,99 0,97	1,5(1)	V
Reverse leakage current	I_R	V_r = 1600 V				25 150			100 2000	µA
Thermal										
Thermal resistance junction to sink(2)	$R_{th(j-s)}$	λ_{paste} = 5,2 W/mK (PTM)						0,4		K/W
Thermistor										
Static										
Rated resistance	R					25		5		kΩ
Deviation of R100	$\Delta_{R/R}$	R_{100} = 493 Ω				100	-5		5	%
Power dissipation	P							245		mW
Power dissipation constant	d					25		1,4		mW/K
B-value	$B_{(25/50)}$	Tol. ±2 %						3375		K
B-value	$B_{(25/100)}$	Tol. ±2 %						3437		K
Vincotech Thermistor Reference									K	

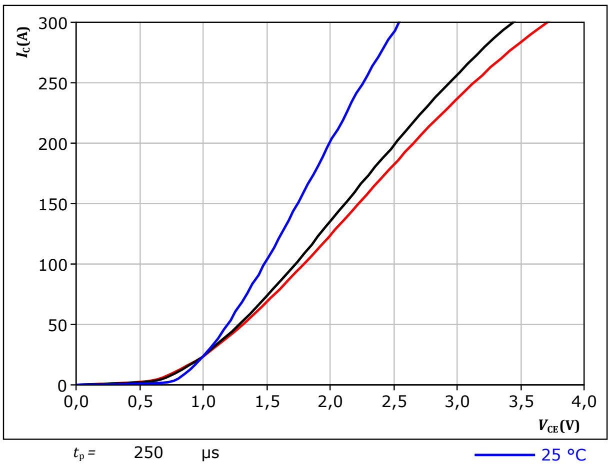
(1) Value at chip level
(2) Only valid with pre-applied Vincotech thermal interface material.

Inverter Switch Characteristics

figure 1. **IGBT**

Typical output characteristics

I_C = f(V_{CE})

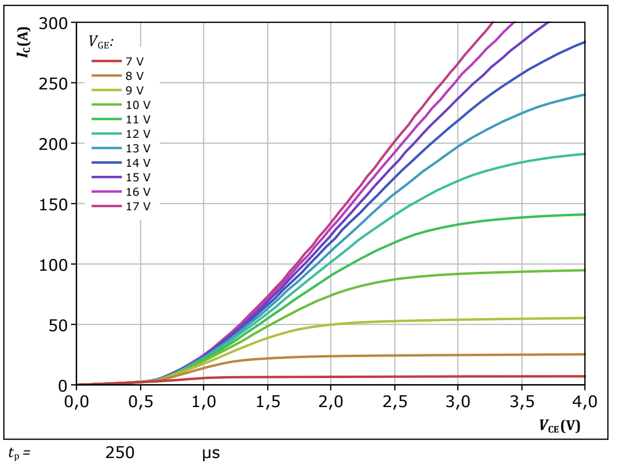


t_p =	250	µs		25 °C
V_{GE} =	15	V	T_j:	125 °C
				150 °C

figure 2. **IGBT**

Typical output characteristics

I_C = f(V_{CE})



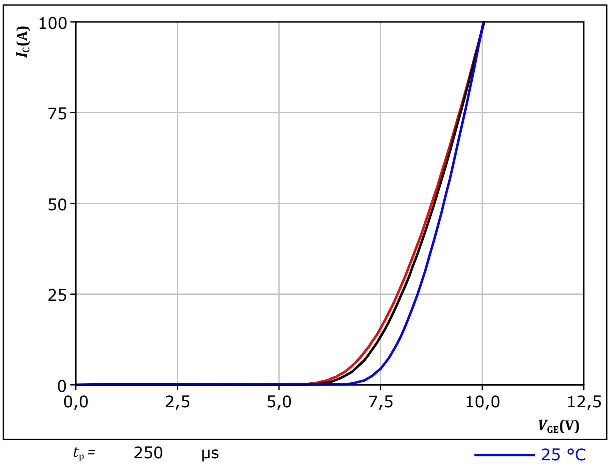
t_p =	250	µs
T_j =	150	°C

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

figure 3. **IGBT**

Typical transfer characteristics

I_C = f(V_{GE})

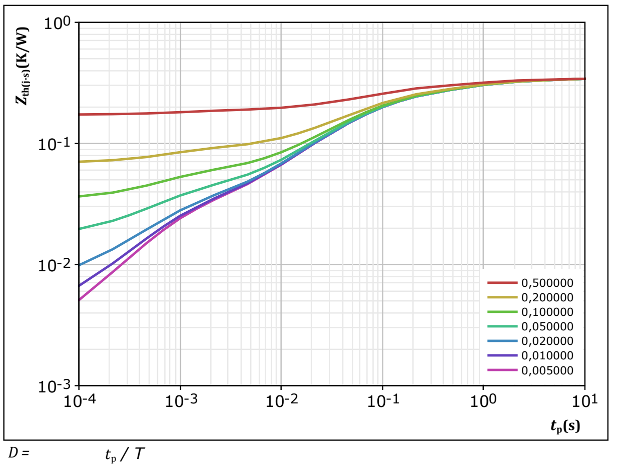


t_p =	250	µs		25 °C
V_{CE} =	18	V	T_j:	125 °C
				150 °C

figure 4. **IGBT**

Transient thermal impedance as a function of pulse width

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



D =	t_p / T	
$R_{th(j-s)}$ =	0,342	K/W

IGBT thermal model values

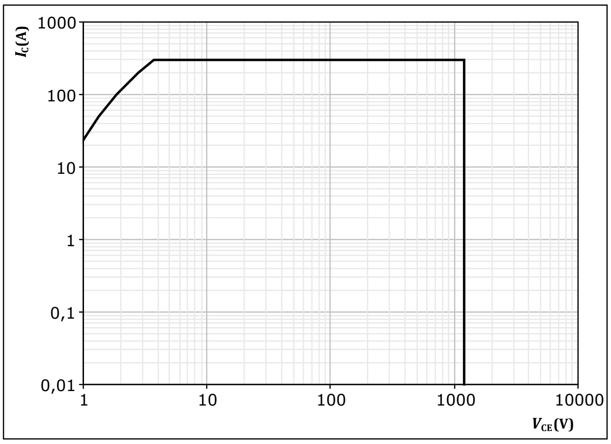
R (K/W)	τ (s)
3,09E-02	4,35E+00
9,25E-02	5,63E-01
1,46E-01	7,39E-02
5,08E-02	1,77E-02
2,46E-02	7,15E-04

Inverter Switch Characteristics

figure 5. **IGBT**

Safe operating area

I_C = f(V_{CE})



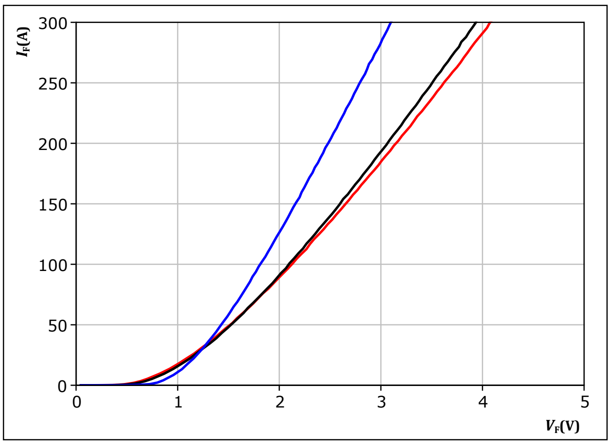
D =	single pulse	
T_s =	80	°C
V_{GE} =	15	V
T_j =	T_{jmax}	

Inverter Diode Characteristics

figure 6. **FWD**

Typical forward characteristics

I_F = f(V_F)



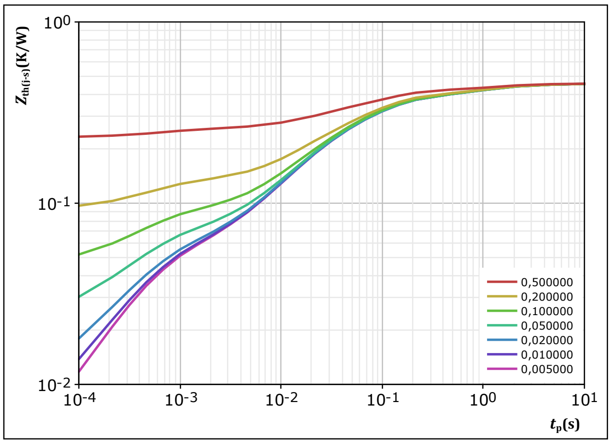
t_p = 250 µs

T_j: 25 °C, 125 °C, 150 °C

figure 7. **FWD**

Transient thermal impedance as a function of pulse width

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



D = t_p / T

$R_{th(j-s)}$ = 0,456 K/W

FWD thermal model values

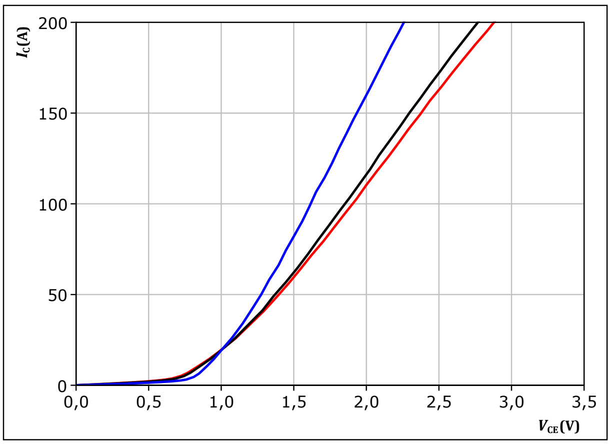
R (K/W)	τ (s)
1,59E-02	8,35E+00
7,77E-02	8,89E-01
2,02E-01	7,51E-02
1,20E-01	1,54E-02
4,51E-02	4,44E-04

Brake Switch Characteristics

figure 8. **IGBT**

Typical output characteristics

I_C = f(V_{CE})

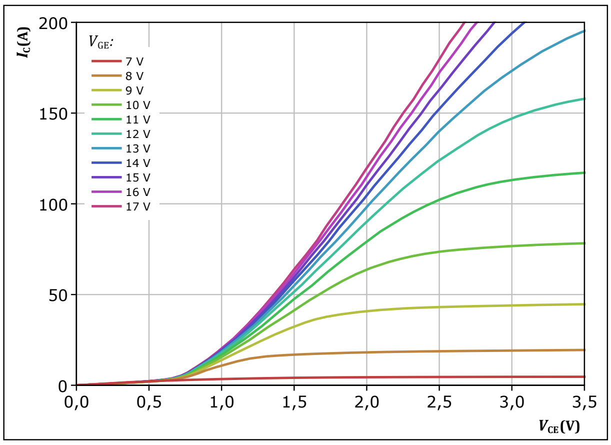


t_p = 250 µs
V_{GE} = 15 V
T_j: 25 °C, 125 °C, 150 °C

figure 9. **IGBT**

Typical output characteristics

I_C = f(V_{CE})

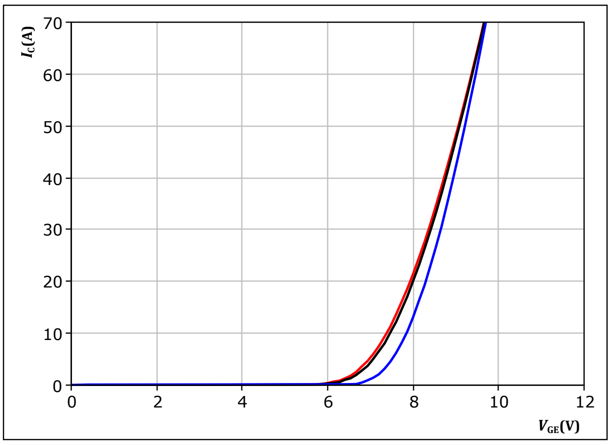


t_p = 250 µs
T_j = 150 °C
V_{GE} from 7 V to 17 V in steps of 1 V

figure 10. **IGBT**

Typical transfer characteristics

I_C = f(V_{GE})

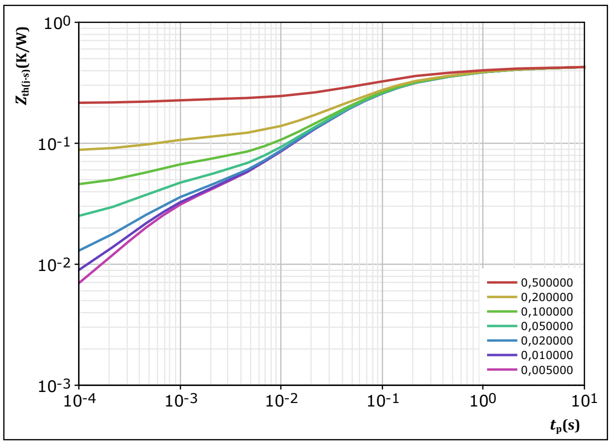


t_p = 250 µs
V_{CE} = 19 V
T_j: 25 °C, 125 °C, 150 °C

figure 11. **IGBT**

Transient thermal impedance as a function of pulse width

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



D = t_p / T
$R_{th(j-s)}$ = 0,427 K/W

IGBT thermal model values

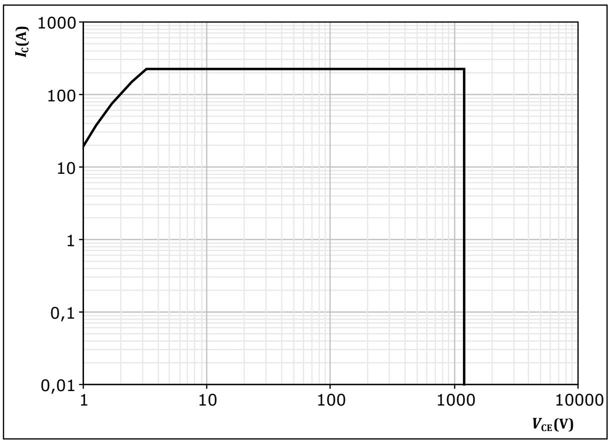
R (K/W)	τ (s)
3,71E-02	3,98E+00
1,00E-01	4,99E-01
1,87E-01	7,90E-02
7,65E-02	1,78E-02
2,84E-02	5,67E-04

Brake Switch Characteristics

figure 12. **IGBT**

Safe operating area

I_C = f(V_{CE})



D = single pulse

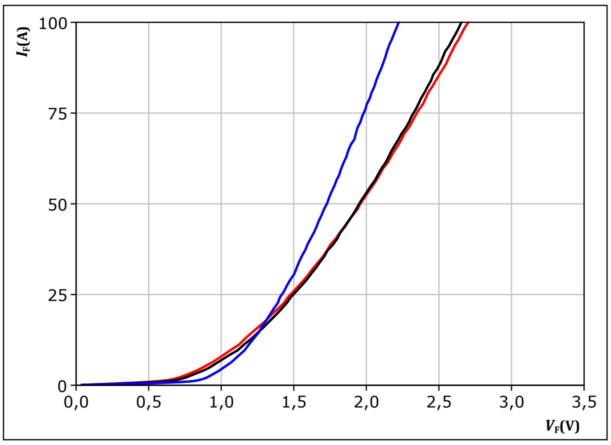
T_s =	80	°C
V_{GE} =	15	V
T_j =	T_{jmax}	

Brake Diode Characteristics

figure 13. **FWD**

Typical forward characteristics

I_F = f(V_F)



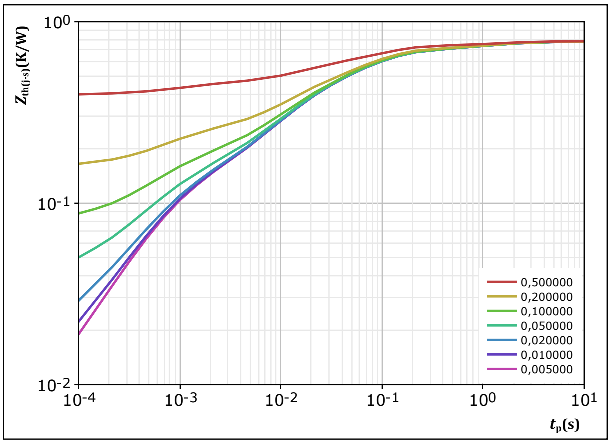
t_p = 250 µs

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

$R_{th(j-s)}$ = 0,781 K/W

FWD thermal model values

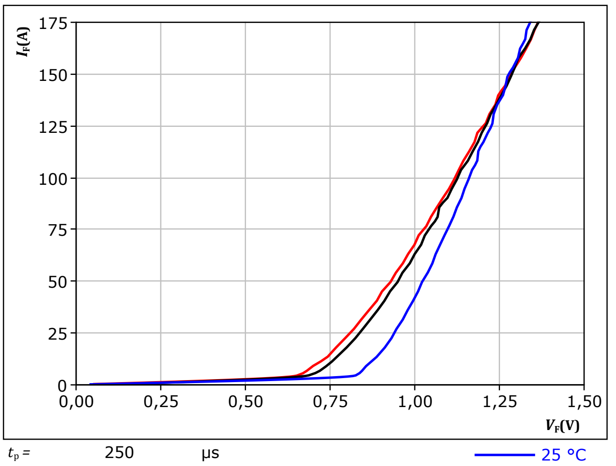
R (K/W)	τ (s)
1,80E-02	1,74E+01
9,28E-02	1,00E+00
3,40E-01	6,85E-02
2,34E-01	1,16E-02
1,02E-01	6,78E-04

Rectifier Diode Characteristics

figure 15. **Rectifier**

Typical forward characteristics

I_F = f(V_F)



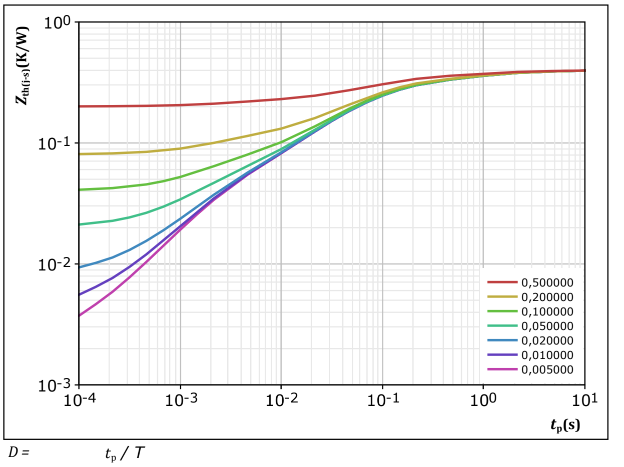
t_p = 250 µs

T_j: 25 °C, 125 °C, 150 °C

figure 16. **Rectifier**

Transient thermal impedance as a function of pulse width

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



D = t_p / T

$R_{th(j-s)}$ = 0,397 K/W

Rectifier thermal model values

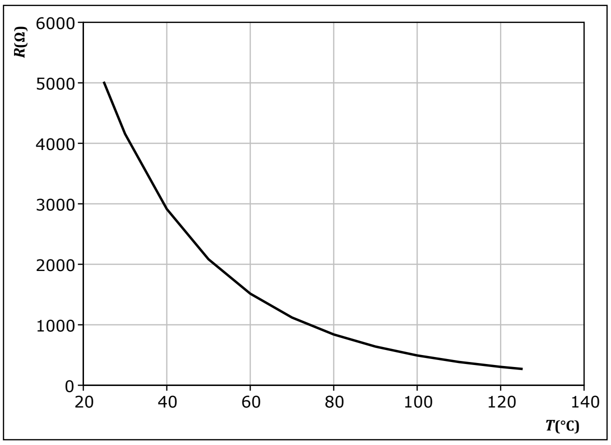
R (K/W)	τ (s)
2,50E-02	5,11E+00
8,16E-02	7,18E-01
1,75E-01	8,94E-02
8,51E-02	2,34E-02
3,30E-02	2,04E-03

Thermistor Characteristics

figure 17.	Thermistor

Typical NTC characteristic as function of temperature

R_T = f(T)

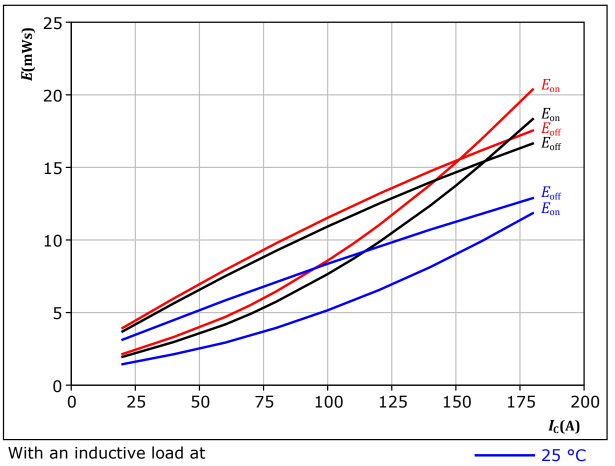


Inverter Switching Characteristics

figure 18. **IGBT**

Typical switching energy losses as a function of collector current

E = f(I_C)



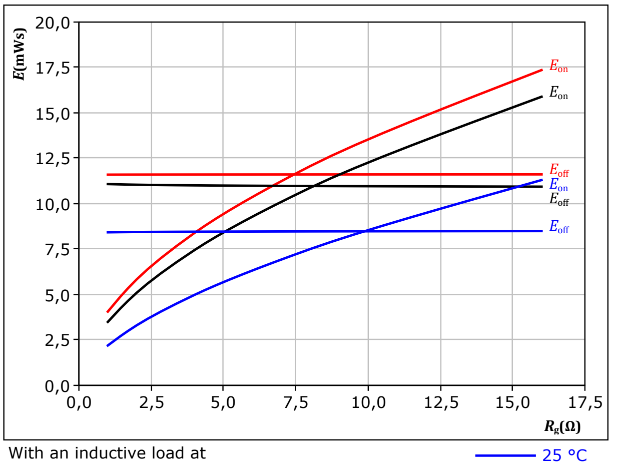
With an inductive load at

V_{CE} =	600	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
R_{gon} =	4	Ω		150 °C
R_{goff} =	4	Ω		

figure 19. **IGBT**

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

E = f(R_g)



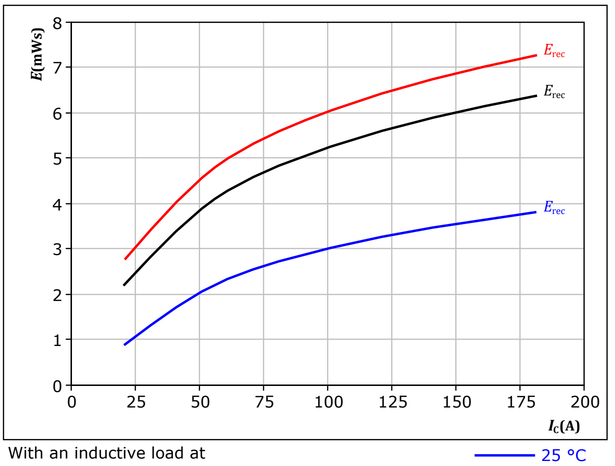
With an inductive load at

V_{CE} =	600	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
I_C =	100	A		150 °C

figure 20. **FWD**

Typical reverse recovered energy loss as a function of collector current

E_{rec} = f(I_C)



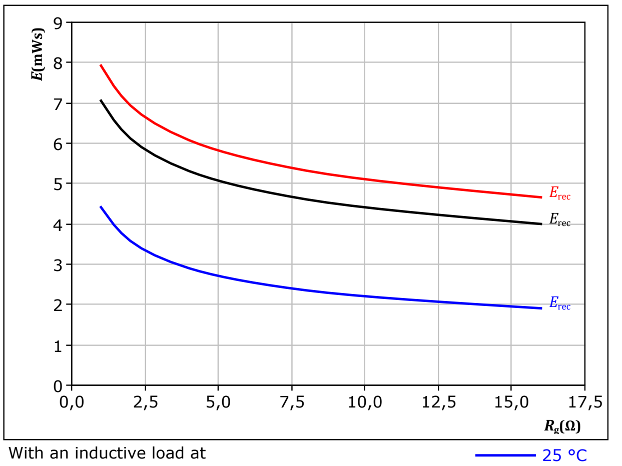
With an inductive load at

V_{CE} =	600	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
R_{gon} =	4	Ω		150 °C

figure 21. **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

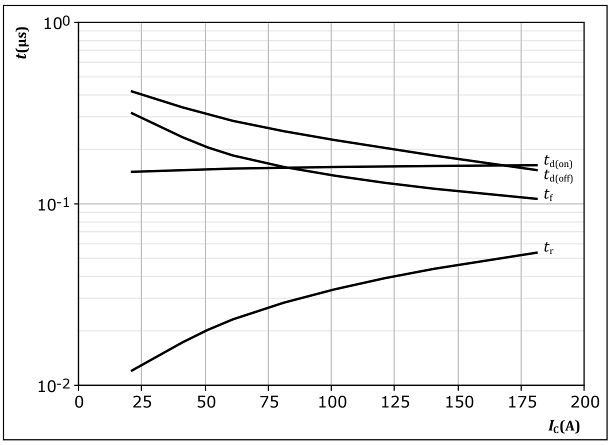
V_{CE} =	600	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
I_C =	100	A		150 °C

Inverter Switching Characteristics

figure 22. **IGBT**

Typical switching times as a function of collector current

t = f(I_C)



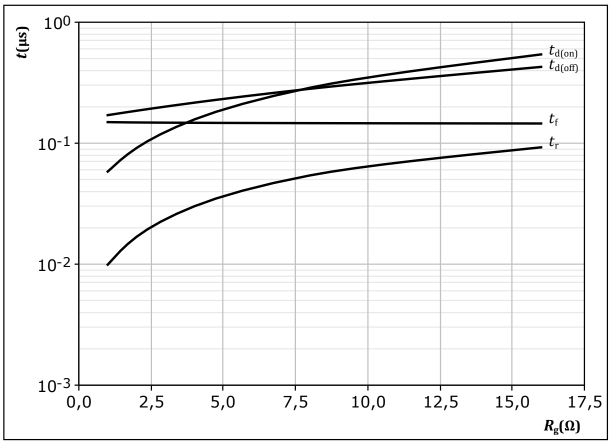
With an inductive load at

T_j =	150	°C
V_{CE} =	600	V
V_{GE} =	±15	V
R_{gon} =	4	Ω
R_{goff} =	4	Ω

figure 23. **IGBT**

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

t = f(R_g)



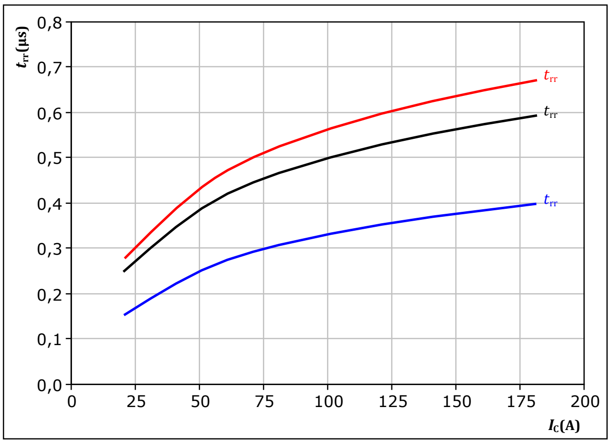
With an inductive load at

T_j =	150	°C
V_{CE} =	600	V
V_{GE} =	±15	V
I_C =	100	A

figure 24. **FWD**

Typical reverse recovery time as a function of collector current

t_{rr} = f(I_C)



With an inductive load at

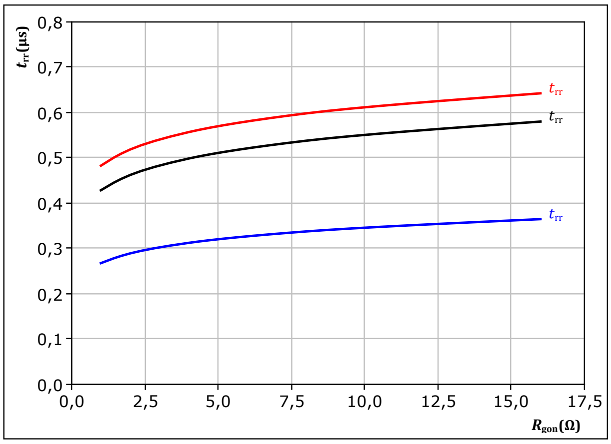
V_{CE} =	600	V
V_{GE} =	±15	V
R_{gon} =	4	Ω

T_j: 25 °C, 125 °C, 150 °C

figure 25. **FWD**

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

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



With an inductive load at

V_{CE} =	600	V
V_{GE} =	±15	V
I_C =	100	A

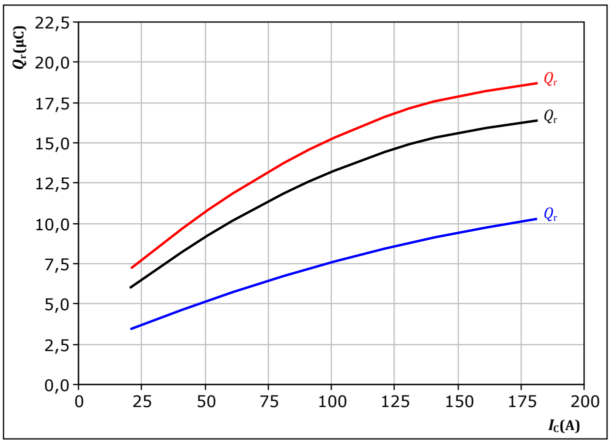
T_j: 25 °C, 125 °C, 150 °C

Inverter Switching Characteristics

figure 26. **FWD**

Typical recovered charge as a function of collector current

Q_r = f(I_C)



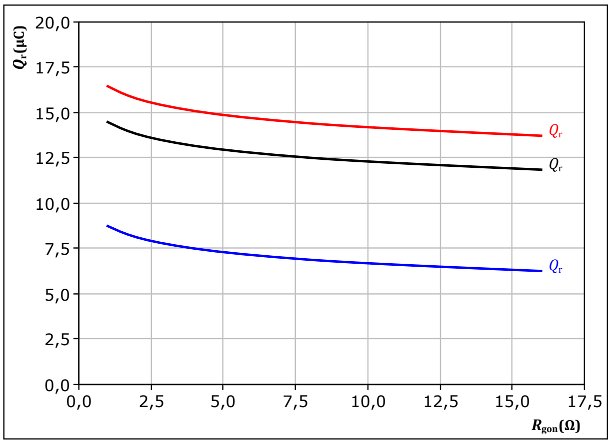
With an inductive load at

V_{CE} =	600	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
R_{gon} =	4	Ω		150 °C

figure 27. **FWD**

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

Q_r = f(R_{gon})



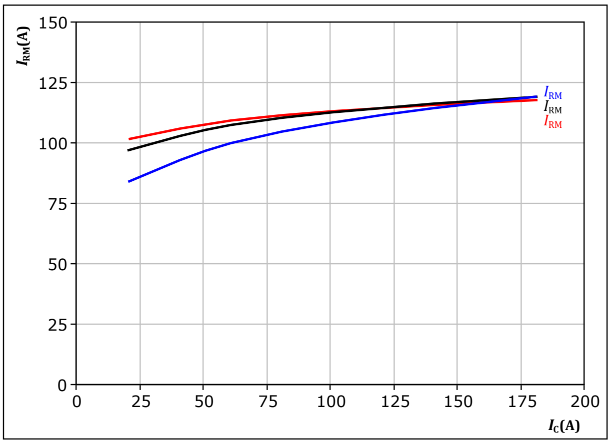
With an inductive load at

V_{CE} =	600	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
I_C =	100	A		150 °C

figure 28. **FWD**

Typical peak reverse recovery current as a function of collector current

I_{RM} = f(I_C)



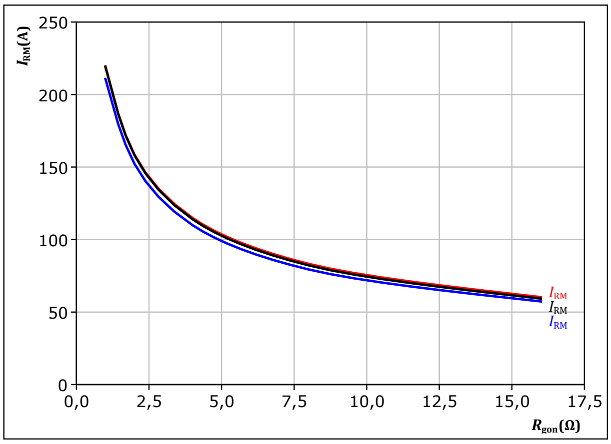
With an inductive load at

V_{CE} =	600	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
R_{gon} =	4	Ω		150 °C

figure 29. **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

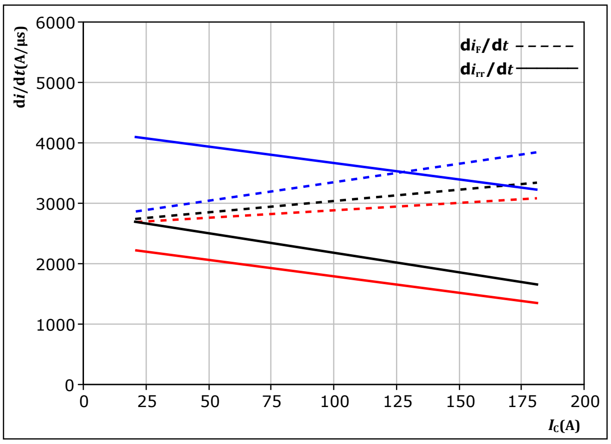
V_{CE} =	600	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
I_C =	100	A		150 °C

Inverter 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

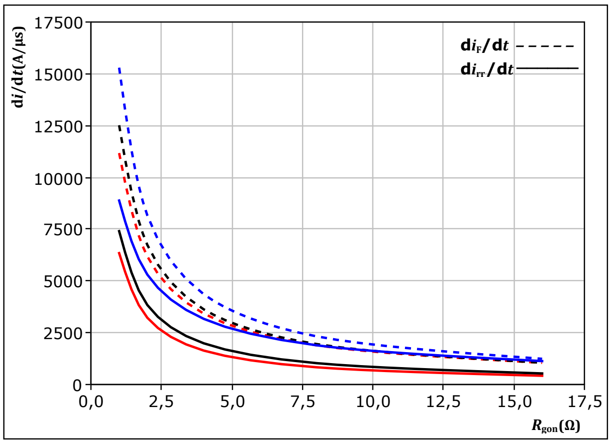
V_{CE} =	600	V	
V_{GE} =	±15	V	
R_{gon} =	4	Ω	

T_j: 25 °C, 125 °C, 150 °C

figure 31. **FWD**

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

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



With an inductive load at

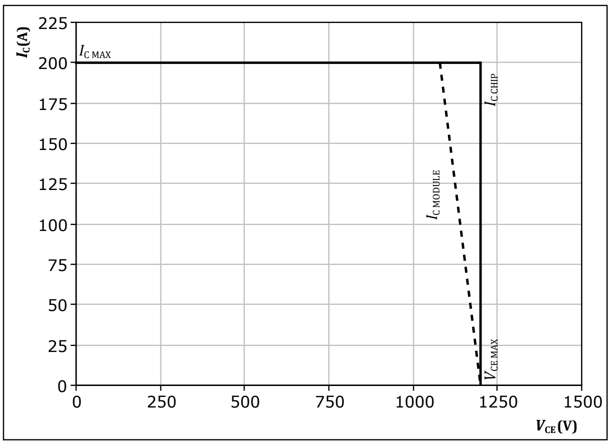
V_{CE} =	600	V	
V_{GE} =	±15	V	
I_C =	100	A	

T_j: 25 °C, 125 °C, 150 °C

figure 32. **IGBT**

Reverse bias safe operating area

I_C = f(V_{CE})



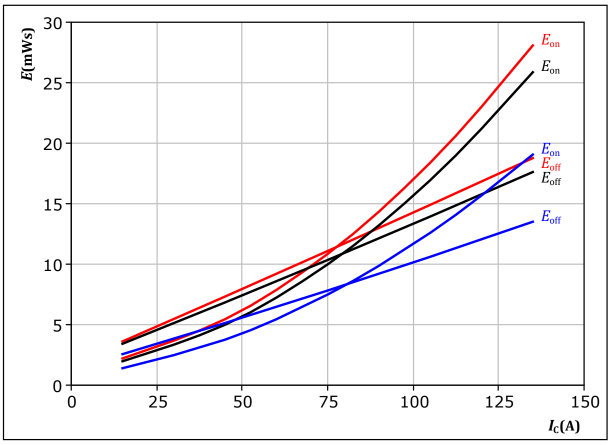
At	T_j =	150	°C
	R_{gon} =	4	Ω
	R_{goff} =	4	Ω

Brake Switching Characteristics

figure 33. **IGBT**

Typical switching energy losses as a function of collector current

E = f(I_C)



With an inductive load at

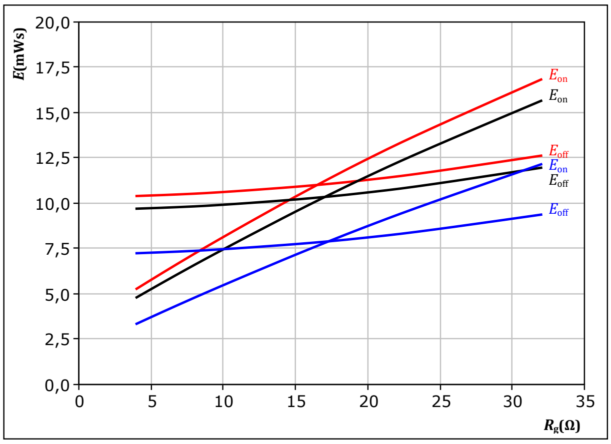
V_{CE} =	700	V	
V_{GE} =	0/15	V	
R_{gon} =	16	Ω	
R_{goff} =	16	Ω	

T_j: 25 °C, 125 °C, 150 °C

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

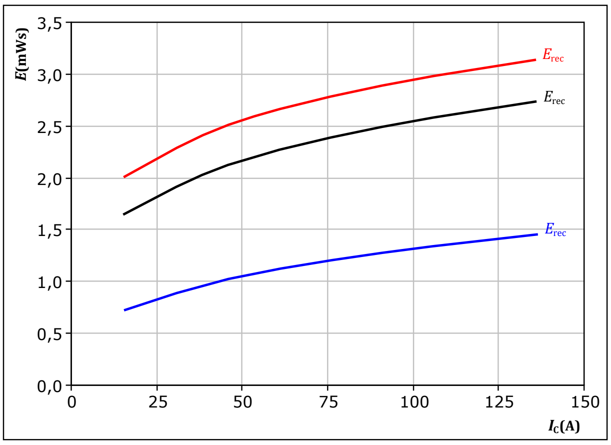
V_{CE} =	700	V
V_{GE} =	0/15	V
I_C =	75	A

T_j: 25 °C, 125 °C, 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

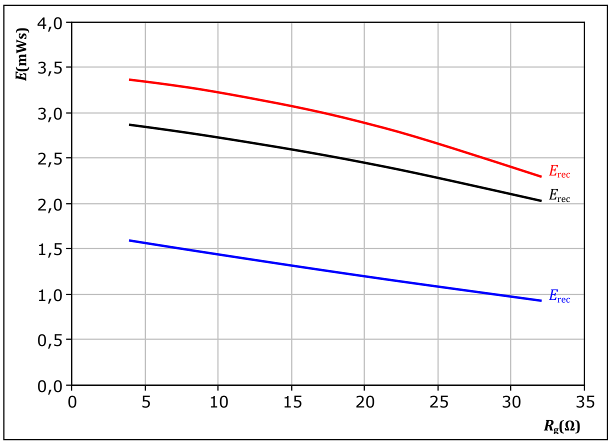
V_{CE} =	700	V
V_{GE} =	0/15	V
R_{gon} =	16	Ω

T_j: 25 °C, 125 °C, 150 °C

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} =	700	V
V_{GE} =	0/15	V
I_C =	75	A

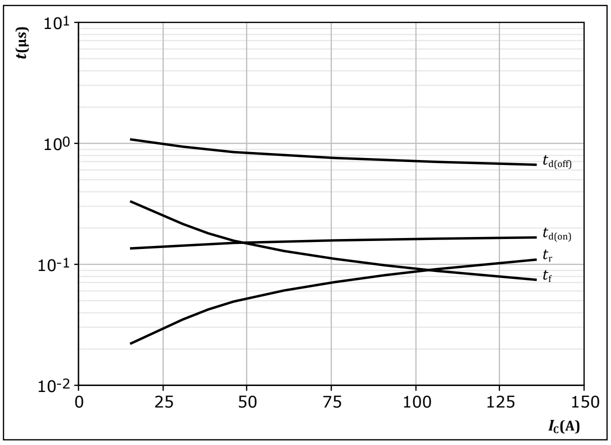
T_j: 25 °C, 125 °C, 150 °C

Brake Switching Characteristics

figure 37. **IGBT**

Typical switching times as a function of collector current

$t = f(I_C)$



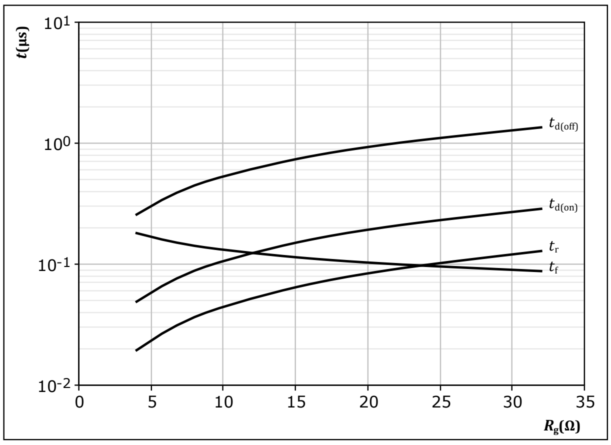
With an inductive load at

T_j =	150	°C
V_{CE} =	700	V
V_{GE} =	0/15	V
R_{gon} =	16	Ω
R_{goff} =	16	Ω

figure 38. **IGBT**

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

$t = f(R_g)$



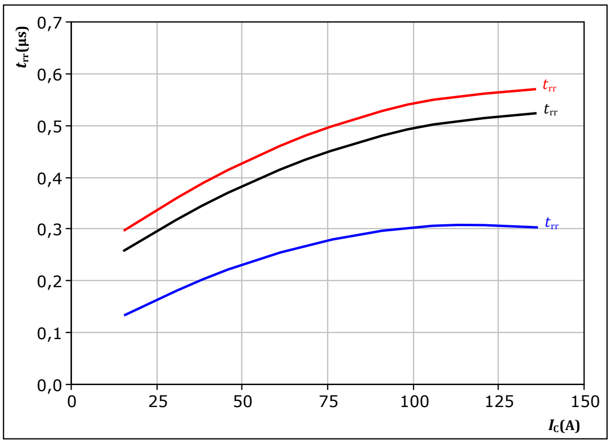
With an inductive load at

T_j =	150	°C
V_{CE} =	700	V
V_{GE} =	0/15	V
I_C =	75	A

figure 39. **FWD**

Typical reverse recovery time as a function of collector current

$t_{rr} = f(I_C)$



With an inductive load at

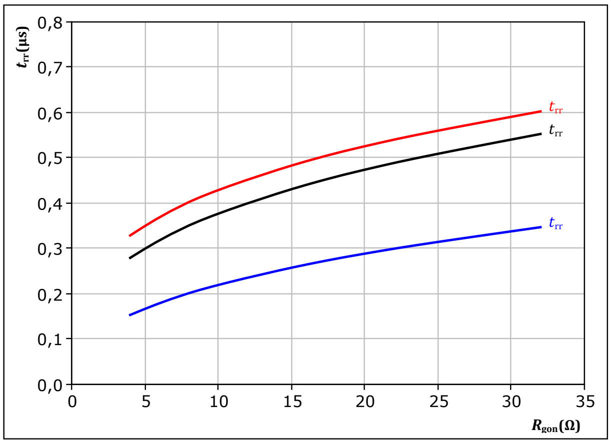
V_{CE} =	700	V
V_{GE} =	0/15	V
R_{gon} =	16	Ω

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} =	700	V
V_{GE} =	0/15	V
I_C =	75	A

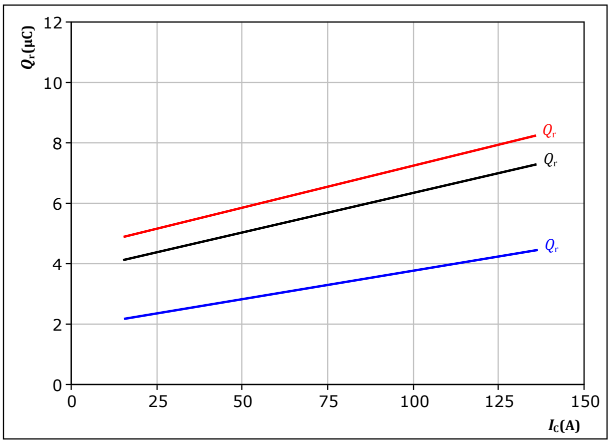
T_j: 25 °C, 125 °C, 150 °C

Brake Switching Characteristics

figure 41. **FWD**

Typical recovered charge as a function of collector current

Q_r = f(I_C)



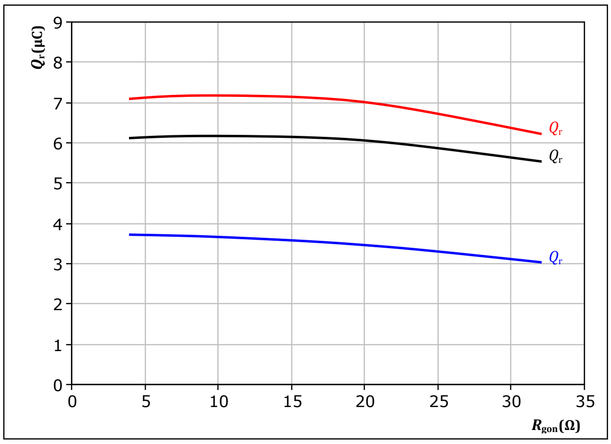
With an inductive load at

V_{CE} =	700	V	T_j:	25 °C / 125 °C / 150 °C
V_{GE} =	0/15	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})



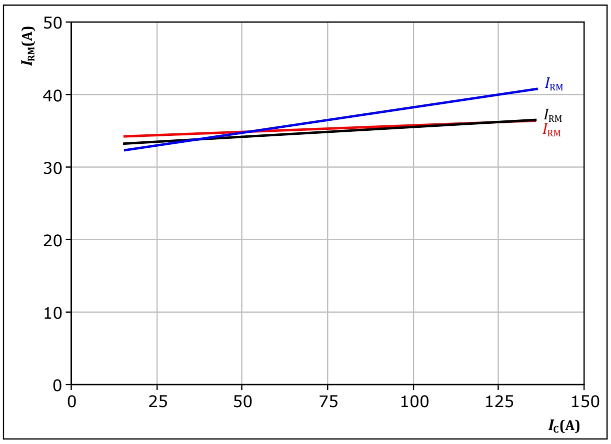
With an inductive load at

V_{CE} =	700	V	T_j:	25 °C / 125 °C / 150 °C
V_{GE} =	0/15	V		
I_C =	75	A		

figure 43. **FWD**

Typical peak reverse recovery current as a function of collector current

I_{RM} = f(I_C)



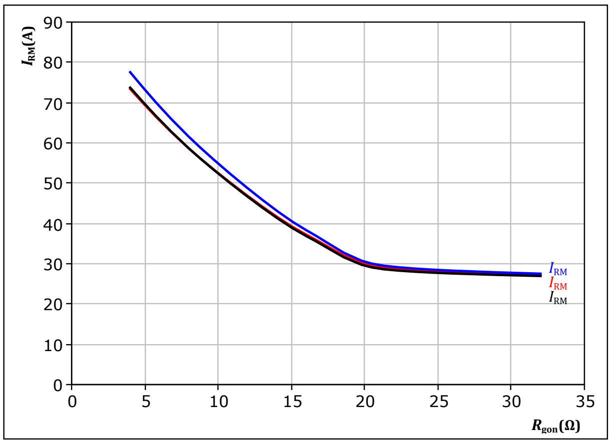
With an inductive load at

V_{CE} =	700	V	T_j:	25 °C / 125 °C / 150 °C
V_{GE} =	0/15	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

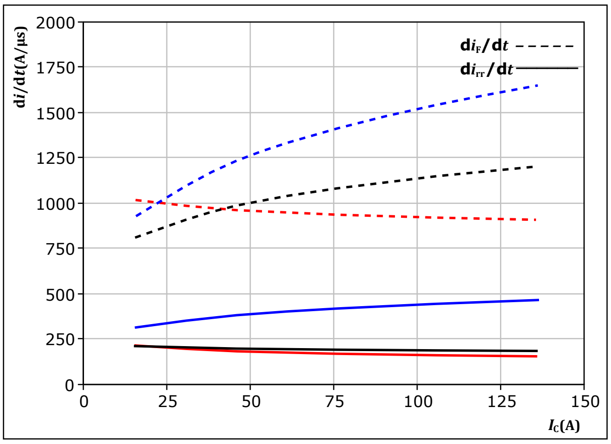
V_{CE} =	700	V	T_j:	25 °C / 125 °C / 150 °C
V_{GE} =	0/15	V		
I_C =	75	A		

Brake 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)



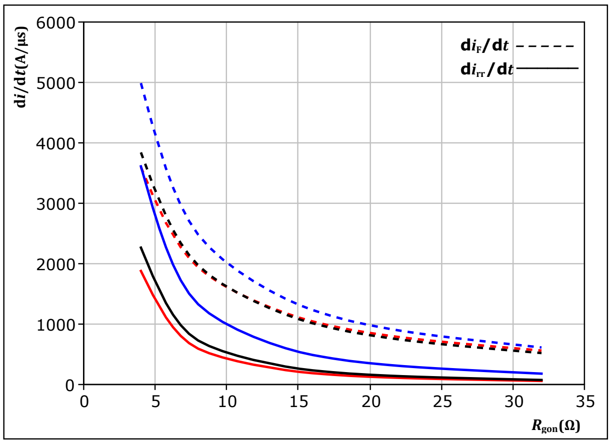
With an inductive load at

V_{CE} =	700	V	T_j: 25 °C / 125 °C / 150 °C
V_{GE} =	0/15	V	
R_{gon} =	16	Ω	

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})



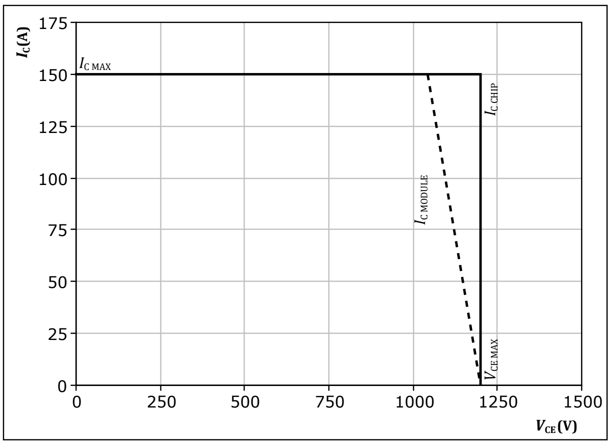
With an inductive load at

V_{CE} =	700	V	T_j: 25 °C / 125 °C / 150 °C
V_{GE} =	0/15	V	
I_C =	75	A	

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}**)**

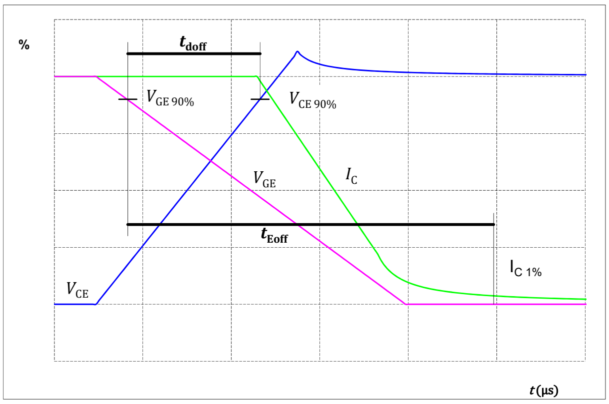


figure 49. **IGBT**

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

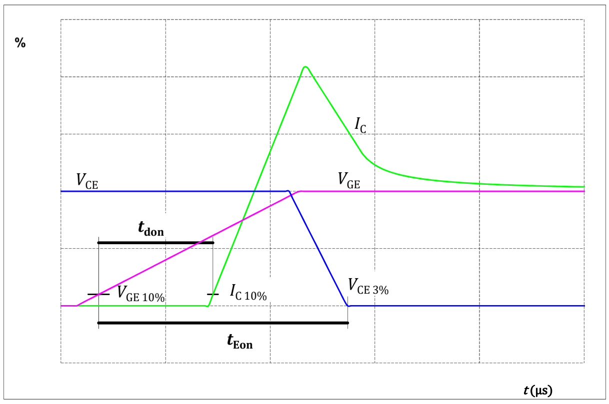


figure 50. **IGBT**

Turn-off Switching Waveforms & definition of t_f

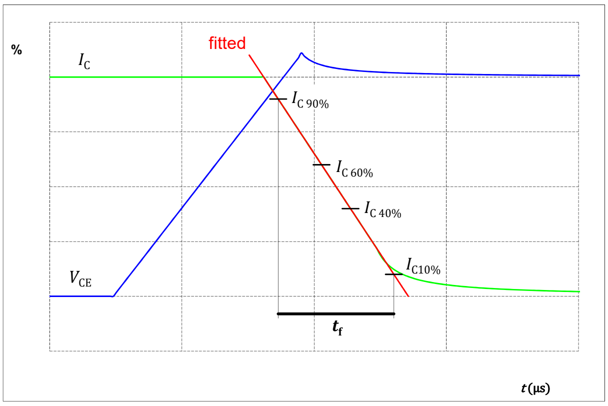
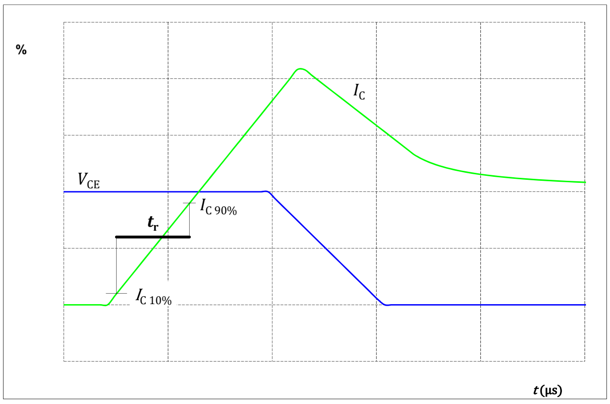


figure 51. **IGBT**

Turn-on Switching Waveforms & definition of t_r



Switching Definitions

figure 52. **FWD**

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

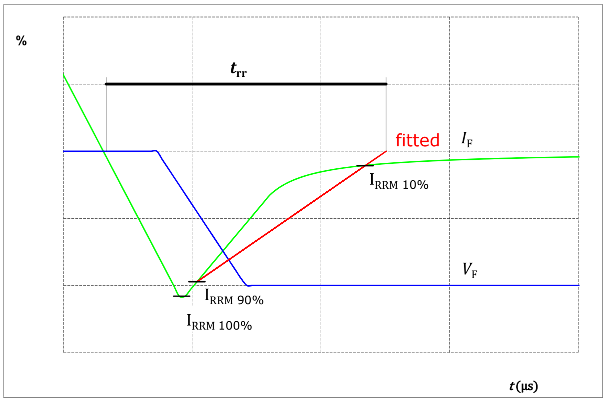
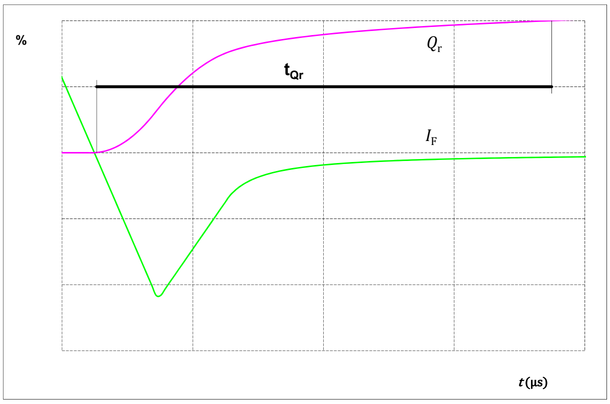


figure 53. **FWD**

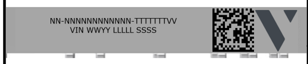
Turn-on Switching Waveforms & definition of t_{Qr} (t_{Qr} = integrating time for Q_r)



Ordering Code

Version	Ordering Code
Without thermal paste	A0-VP12PMA100RA-LF17A80T
With thermal paste (5,2 W/mK, PTM6000HV)	A0-VP12PMA100RA-LF17A80T-/7/

Marking

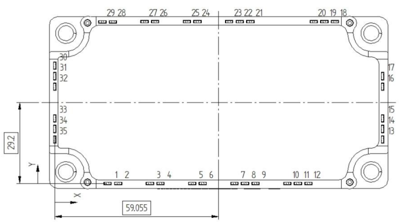


Text	**Name**		**VIN**	**Date code**	**Lot**	**Serial**
	NN-NNNNNNNNNNNNNN-TTTTTTTVV		VIN	WWYY	LLLLL	SSSS
Datamatrix	**Type&Ver**	**Lot number**	**Serial**	**Date code**		
	TTTTTTTVV	LLLLL	SSSS	WWYY		

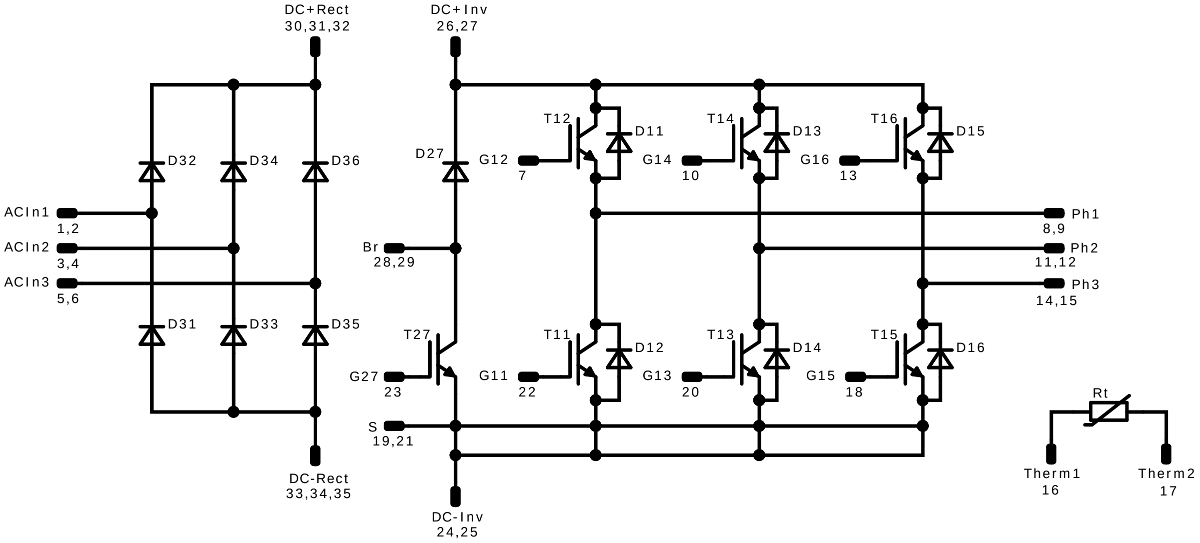
Outline

Pin table [mm]

Pin	X	Y	Function
1	19,05	0	ACIn1
2	22,86	0	ACIn1
3	34,29	0	ACIn2
4	38,1	0	ACIn2
5	49,53	0	ACIn3
6	53,34	0	ACIn3
7	64,77	0	G12
8	68,58	0	Ph1
9	72,36	0	Ph1
10	83,82	0	G14
11	87,56	0	Ph2
12	91,45	0	Ph2
13	118,11	15,865	G16
14	118,11	19,675	Ph3
15	118,11	23,485	Ph3
16	118,11	34,915	Therm1
17	118,11	38,725	Therm2
18	100,965	58,4	G15
19	97,155	58,4	S
20	93,305	58,4	G13
21	70,505	58,4	S
22	66,655	58,4	G11
23	62,855	58,4	G27
24	51,395	58,4	DC-Inv
25	47,585	58,4	DC-Inv
26	36,195	58,4	DC+Inv
27	32,385	58,4	DC+Inv
28	20,975	58,4	Br
29	17,175	58,4	Br
30	0	42,535	DC+Rect
31	0	38,725	DC+Rect
32	0	34,915	DC+Rect
33	0	23,485	DC+Rect
34	0	19,675	DC+Rect
35	0	15,865	DC+Rect



Pinout



Identification

ID	Component	Voltage	Current	Function	Comment
T11, T12, T13, T14, T15, T16	IGBT	1200 V	100 A	Inverter Switch	
D11, D12, D13, D14, D15, D16	FWD	1200 V	100 A	Inverter Diode	
T27	IGBT	1200 V	75 A	Brake Switch	
D27	FWD	1200 V	40 A	Brake Diode	
D31, D32, D33, D34, D35, D36	Rectifier	1600 V	60 A	Rectifier Diode	
Rt	Thermistor			Thermistor	

Packaging instruction				
Standard packaging quantity (SPQ) 24	>SPQ	Standard	<SPQ	Sample

Handling instruction
Handling instructions for VINco E3s packages see vincotech.com website.

Package data
Package data for VINco E3s packages see vincotech.com website.

Vincotech thermistor reference
See Vincotech thermistor reference table at vincotech.com website.

UL recognition and file number
Certification pending. For more information see vincotech.com website.

Document No.:	Date:	Modification:	Pages
A0-VP12PMA100RA-LF17A80T-D1-14	19 Feb. 2025	Initial Release	