A0-VP12PMA150RA-LF18A80T
datasheet

VINcoPIM E3 **1200 V / 150 A**

Topology features

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

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
- Avaliable with press-fit and solder-pin
- Reliable cold welding connection to PCB
- Press-fit terminals

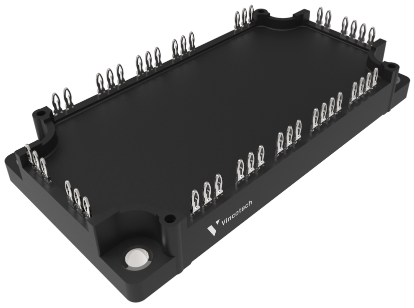
Target applications

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

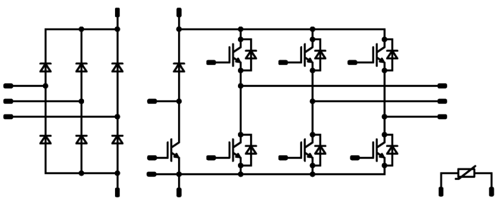
Types

- A0-VP12PMA150RA-LF18A80T

VINco E3s 17 mm housing



Schematic



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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	156	A
Repetitive peak collector current	I_{CRM}	t_p limited by T_{jmax}		450	A
Turn off safe operating area		T_j = 150°C, V_{CE} = 1200 V		450	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$	T_s = 80 °C	347	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	162	A
Repetitive peak forward current	I_{FRM}	t_p limited by T_{jmax}		450	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$	T_s = 80 °C	347	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	121	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

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	64	A
Repetitive peak forward current	I_{FRM}	t_p limited by T_{jmax}		150	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$	T_s = 80 °C	124	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	181	A
Surge (non-repetitive) forward current	I_{FSM}	Single Half Sine Wave, t_p = 10 ms	T_j = 150 °C	1380	A
Surge current capability	I^2t			9522	A^2s
Total power dissipation	P_{tot}	$T_j = T_{jmax}$	T_s = 80 °C	275	W
Maximum junction temperature	T_{jmax}			175	°C
Module Properties					
Thermal Properties					
Storage temperature	T_{stg}			-40…+125	°C
Operation temperature under switching condition	T_{jop}			-40…+(T_{jmax} - 25)	°C
Isolation Properties					
Isolation voltage	V_{isol}	DC Test Voltage*	t_p = 2 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	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 Switch										
Static										
Gate-emitter threshold voltage	$V_{GE(th)}$			5	0,0177	25	5,5	6,3	7,1	V
Collector-emitter saturation voltage	V_{CEsat}		15		150	25 125 150		1,64 1,99 2,1	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		24935		pF
Output capacitance	C_{oes}							566		pF
Reverse transfer capacitance	C_{res}							209		pF
Gate charge	Q_g		0/15	600	150	25		906		nC
Thermal										
Thermal resistance junction to sink(2)	$R_{th(j-s)}$	λ_{paste} = 5,2 W/mK (PTM)						0,27		K/W
Dynamic										
Turn-on delay time	$t_{d(on)}$	R_{gon} = 2 Ω R_{goff} = 2 Ω	±15	600	150	25 125 150		122,7 127,01 127,75		ns
Rise time	t_r					25 125 150		18,45 23,68 25,18		ns
Turn-off delay time	$t_{d(off)}$					25 125 150		171,98 201,74 210,68		ns
Fall time	t_f					25 125 150		106,17 141,39 148,83		ns
Turn-on energy (per pulse)	E_{on}	Q_{rFWD}=10,5 µC Q_{rFWD}=19,69 µC Q_{rFWD}=22,97 µC				25 125 150		6,95 11,26 12,63		mWs
Turn-off energy (per pulse)	E_{off}					25 125 150		13,02 17,01 18,51		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				150	25 125 150		1,74 1,99 2,01	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)						0,27		K/W
Dynamic										
Peak recovery current	I_{RM}	d*i*/d*t*=7626 A/µs d*i*/d*t*=5656 A/µs d*i*/d*t*=5214 A/µs	±15	600	150	25 125 150		156,33 160,52 163,94		A
Reverse recovery time	t_{rr}					25 125 150		190,37 361,95 413,26		ns
Recovered charge	Q_r					25 125 150		10,5 19,69 22,97		µC
Reverse recovered energy	E_{rec}					25 125 150		3,9 7,79 9,14		mWs
Peak rate of fall of recovery current	$(di_{rf}/dt)_{max}$					25 125 150		4328,89 2043,13 1754,59		A/µs

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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 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		1,58 1,9 2	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} = 16 Ω R_{goff} = 16 Ω	0/15	700	100	25 125 150		202,19 194,37 191,77		ns
Rise time	t_r					25 125 150		66,26 85,6 90,37		ns
Turn-off delay time	$t_{d(off)}$					25 125 150		882,14 915,06 924,94		ns
Fall time	t_f					25 125 150		51,65 83,99 92,58		ns
Turn-on energy (per pulse)	E_{on}	Q_{rFWD}=4,96 μC Q_{rFWD}=8,14 μC Q_{rFWD}=9,58 μC				25 125 150		12,46 16,51 17,88		mWs
Turn-off energy (per pulse)	E_{off}					25 125 150		10,59 14,2 15,18		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	
Brake Diode										
Static										
Forward voltage	V_F				50	25 125 150		1,55 1,72 1,72	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)						0,77		K/W
Dynamic										
Peak recovery current	I_{RM}	di/dt=1367 A/µs di/dt=1196 A/µs di/dt=1039 A/µs	0/15	700	100	25 125 150		41,02 38,22 39,53		A
Reverse recovery time	t_{rr}					25 125 150		342,03 535,23 600,86		ns
Recovered charge	Q_r					25 125 150		4,96 8,14 9,58		µC
Reverse recovered energy	E_{rec}					25 125 150		1,79 3,29 3,96		mWs
Peak rate of fall of recovery current	$(di_{rf}/dt)_{max}$					25 125 150		300,62 133,38 125,04		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	
Rectifier Diode										
Static										
Forward voltage	V_F				110	25 125 150		1,24 1,23 1,22	1,5(1)	V
Reverse leakage current	I_R	V_r = 1600 V				25 150			50 2000	µA
Thermal										
Thermal resistance junction to sink(2)	$R_{th(j-s)}$	λ_{paste} = 5,2 W/mK (PTM)						0,35		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	

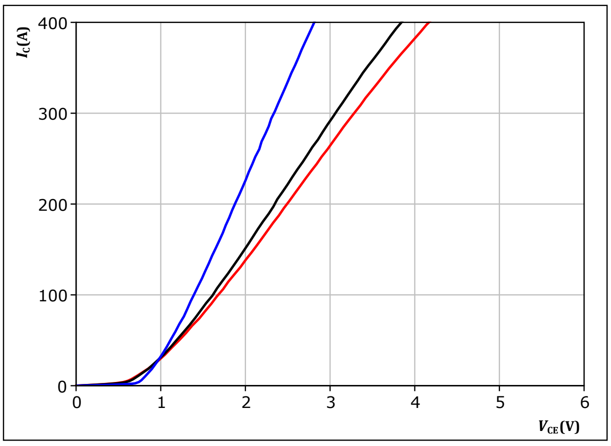
(1) Value at chip level
(2) Only valid with pre-applied Vincotech thermal interface material.

Inverter Switch Characteristics

figure 1. **IGBT**

Typical output characteristics

I_C = f(V_{CE})

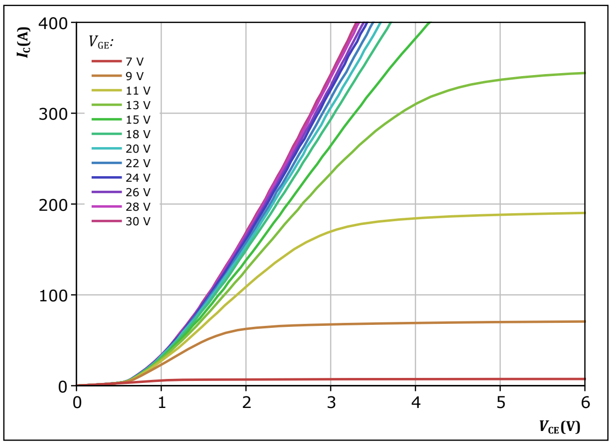


t_p =	250	µs		25 °C
V_{GE} =	15	V	T_j:	125 °C
				150 °C

figure 2. **IGBT**

Typical output characteristics

I_C = f(V_{CE})



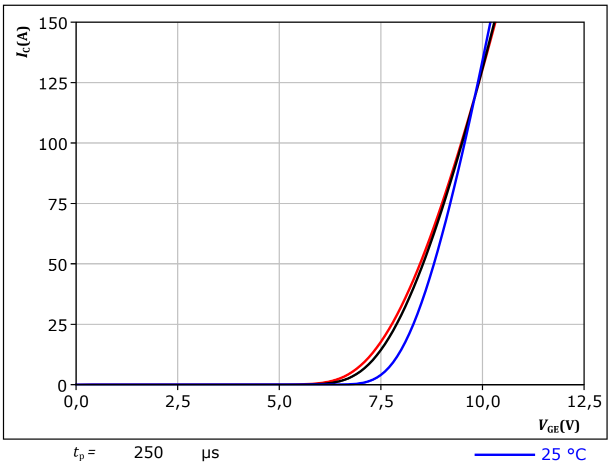
t_p =	250	µs
T_j =	150	°C

V_{GE} from 7 V to 30 V in steps of 2 V

figure 3. **IGBT**

Typical transfer characteristics

I_C = f(V_{GE})

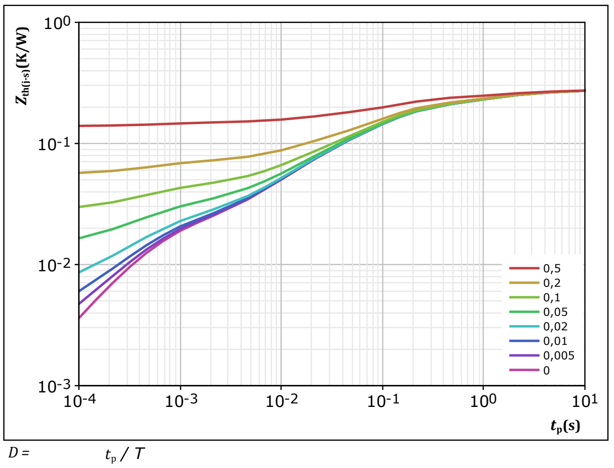


t_p =	250	µs		25 °C
V_{CE} =	30	V	T_j:	125 °C
				150 °C

figure 4. **IGBT**

Transient thermal impedance as a function of pulse width

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



D =	t_p / T	
$R_{th(j-s)}$ =	0,274	K/W

IGBT thermal model values

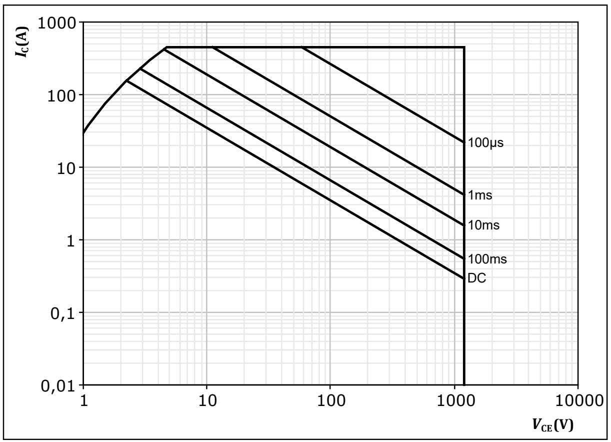
R (K/W)	τ (s)
2,96E-02	5,29E+00
6,20E-02	9,45E-01
1,28E-01	1,01E-01
4,03E-02	1,41E-02
1,71E-02	4,82E-04

Inverter Switch Characteristics

figure 5. **IGBT**

Safe operating area

I_C = f(V_{CE})



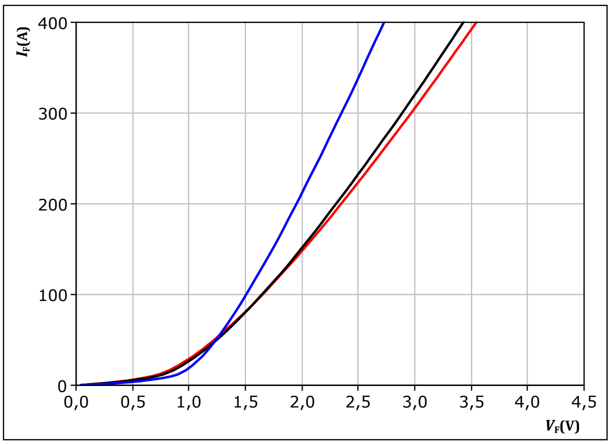
D =	single pulse	
T_s =	80	°C
V_{GE} =	15	V
T_j =	T_{jmax}	

Inverter Diode Characteristics

figure 6. **FWD**

Typical forward characteristics

$I_F = f(V_F)$



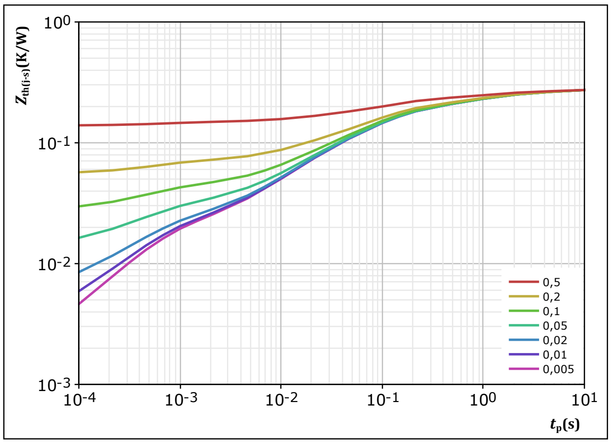
t_p = 250 µs

T_j: 25 °C, 125 °C, 150 °C

figure 7. **FWD**

Transient thermal impedance as a function of pulse width

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



$D = t_p / T$

$R_{th(j-s)}$ = 0,274 K/W

FWD thermal model values

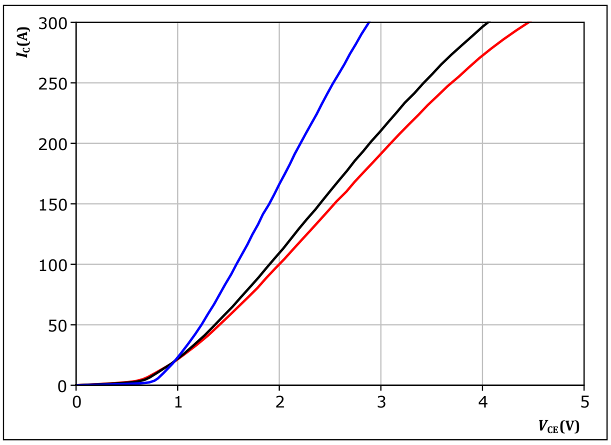
R (K/W)	τ (s)
3,71E-02	4,44E+00
6,82E-02	6,94E-01
1,16E-01	8,51E-02
3,83E-02	1,46E-02
1,72E-02	5,03E-04

Brake Switch Characteristics

figure 8. **IGBT**

Typical output characteristics

$I_C = f(V_{CE})$

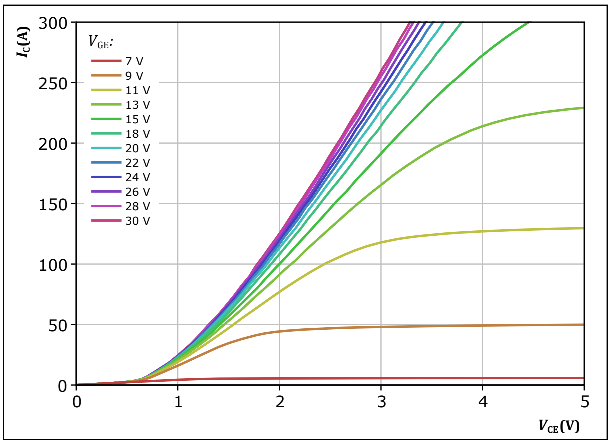


t_p = 250 µs
V_{GE} = 15 V
T_j: 25 °C, 125 °C, 150 °C

figure 9. **IGBT**

Typical output characteristics

$I_C = f(V_{CE})$

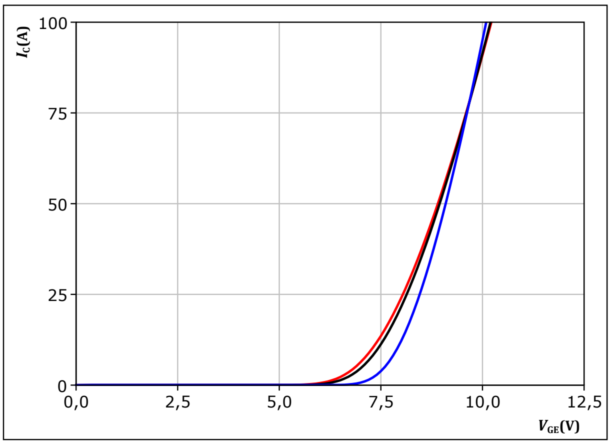


t_p = 250 µs
T_j = 150 °C
V_{GE} from 7 V to 30 V in steps of 2 V

figure 10. **IGBT**

Typical transfer characteristics

$I_C = f(V_{GE})$

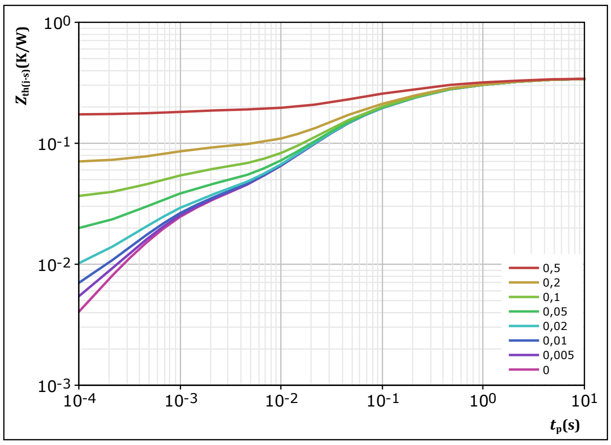


t_p = 250 µs
V_{CE} = 30 V
T_j: 25 °C, 125 °C, 150 °C

figure 11. **IGBT**

Transient thermal impedance as a function of pulse width

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



D = t_p / T
$R_{th(j-s)}$ = 0,341 K/W

IGBT thermal model values

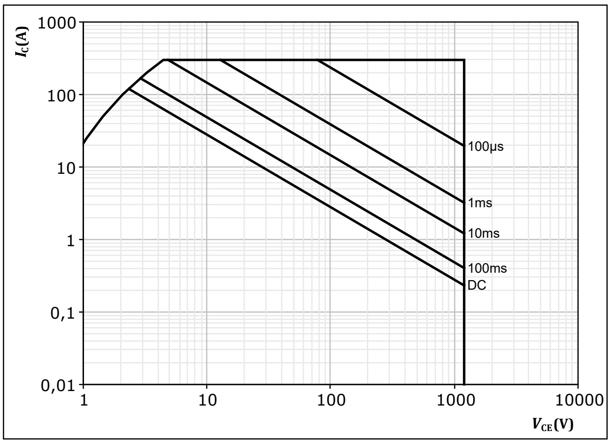
R (K/W)	τ (s)
1,28E-02	9,65E+00
5,94E-02	1,34E+00
1,29E-01	1,91E-01
1,18E-01	3,13E-02
2,62E-02	6,75E-04

Brake Switch Characteristics

figure 12.	IGBT

Safe operating area

I_C = f(V_{CE})



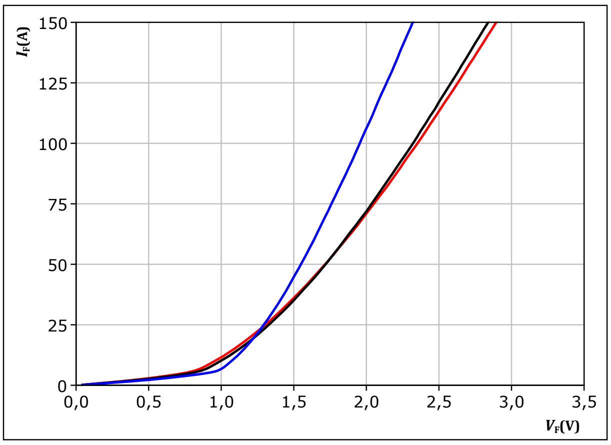
D =	single pulse	
T_s =	80	°C
V_{GE} =	15	V
T_j =	T_{jmax}	

Brake Diode Characteristics

figure 13. **FWD**

Typical forward characteristics

$I_F = f(V_F)$



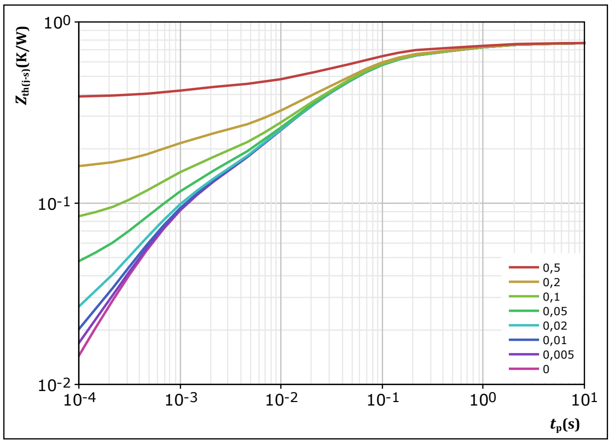
t_p = 250 µs

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

$R_{th(j-s)}$ = 0,765 K/W

FWD thermal model values

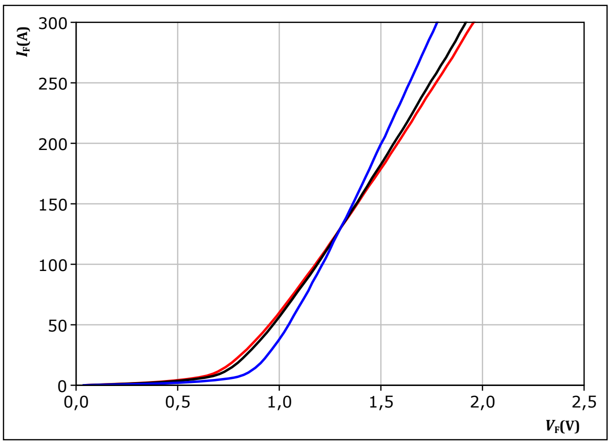
R (K/W)	τ (s)
2,36E-02	5,92E+00
1,19E-01	6,12E-01
3,74E-01	5,70E-02
1,62E-01	1,02E-02
9,08E-02	6,96E-04

Rectifier Diode Characteristics

figure 15. **Rectifier**

Typical forward characteristics

I_F = f(V_F)



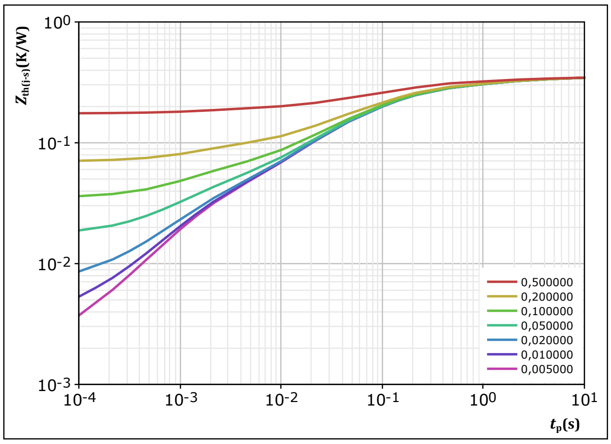
t_p = 250 µs

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

$R_{th(j-s)}$ = 0,346 K/W

Rectifier thermal model values

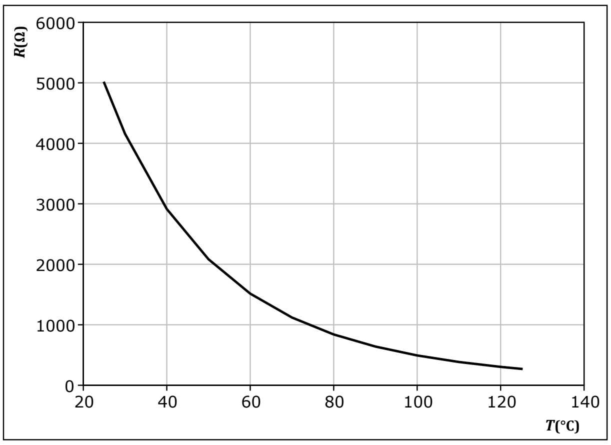
R (K/W)	τ (s)
3,07E-02	5,36E+00
5,91E-02	8,68E-01
1,54E-01	1,21E-01
8,00E-02	2,21E-02
2,68E-02	1,41E-03

Thermistor Characteristics

figure 17.	Thermistor

Typical NTC characteristic as function of temperature

R_T = f(T)

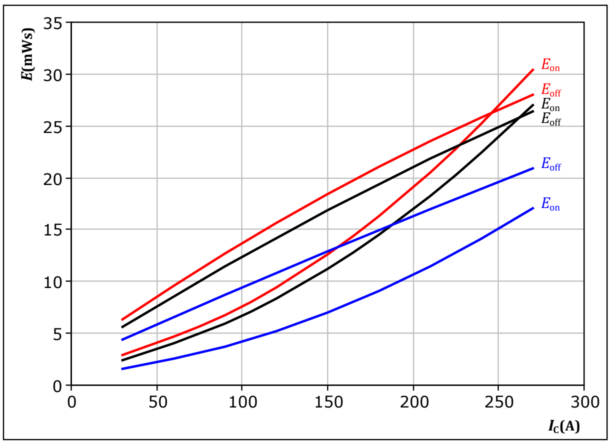


Inverter Switching Characteristics

figure 18. **IGBT**

Typical switching energy losses as a function of collector current

$E = f(I_C)$



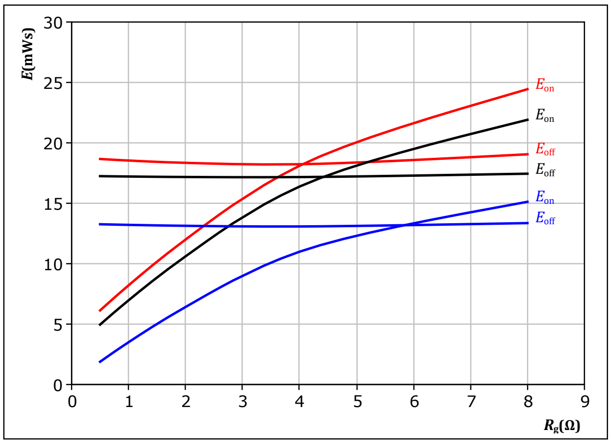
With an inductive load at

V_{CE} =	600	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
R_{gon} =	2	Ω		150 °C
R_{goff} =	2	Ω		

figure 19. **IGBT**

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

$E = f(R_g)$



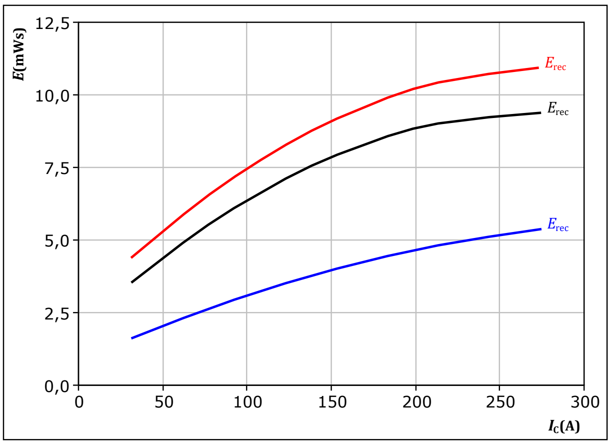
With an inductive load at

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

figure 20. **FWD**

Typical reverse recovered energy loss as a function of collector current

$E_{rec} = f(I_C)$



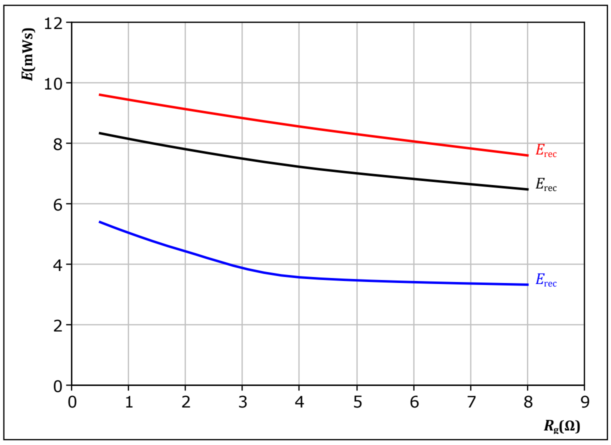
With an inductive load at

V_{CE} =	600	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
R_{gon} =	2	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

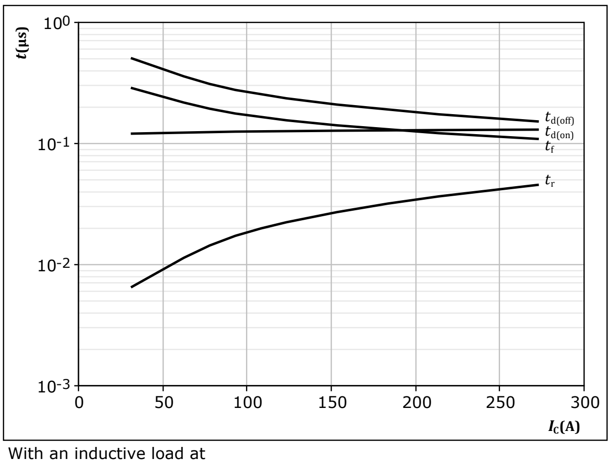
V_{CE} =	600	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
I_C =	150	A		150 °C

Inverter Switching Characteristics

figure 22. **IGBT**

Typical switching times as a function of collector current

$t = f(I_C)$



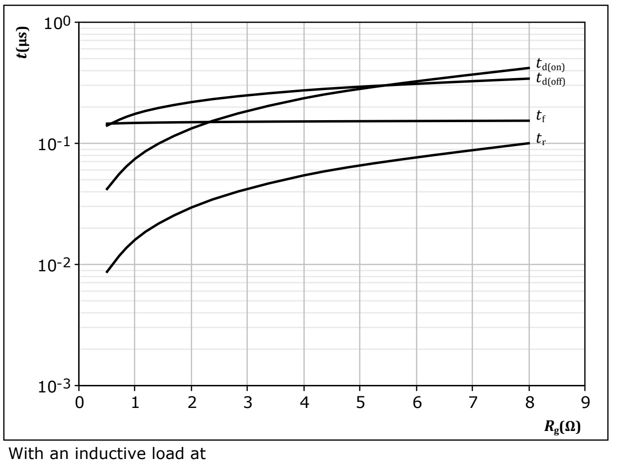
With an inductive load at

T_j =	150	°C
V_{CE} =	600	V
V_{GE} =	±15	V
R_{gon} =	2	Ω
R_{goff} =	2	Ω

figure 23. **IGBT**

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

$t = f(R_g)$



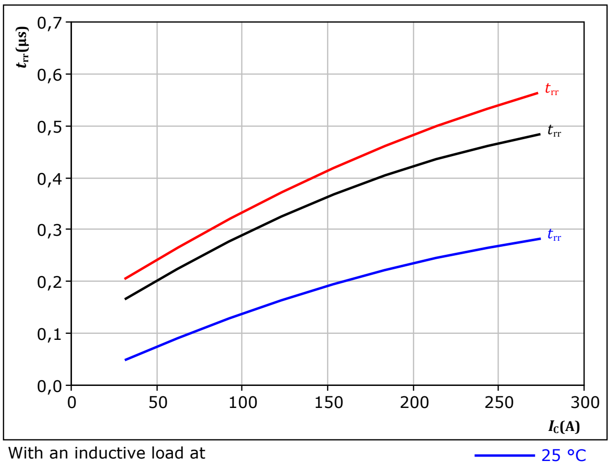
With an inductive load at

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

figure 24. **FWD**

Typical reverse recovery time as a function of collector current

$t_{rr} = f(I_C)$



With an inductive load at

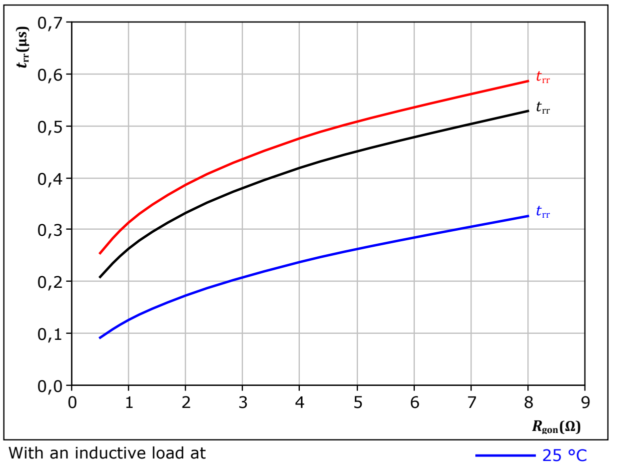
V_{CE} =	600	V
V_{GE} =	±15	V
R_{gon} =	2	Ω

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 =	150	A

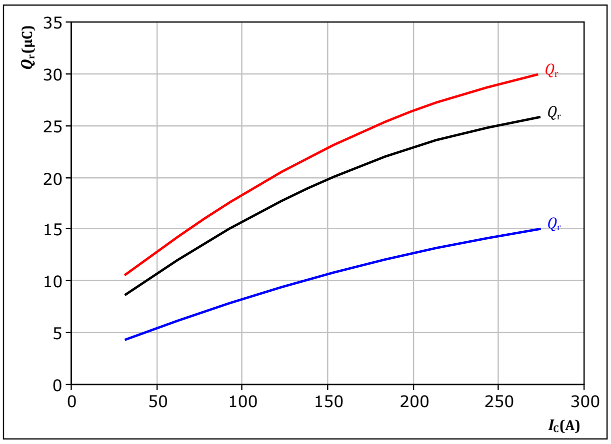
T_j: 25 °C, 125 °C, 150 °C

Inverter Switching Characteristics

figure 26. FWD

Typical recovered charge as a function of collector current

Q_r = f(I_C)



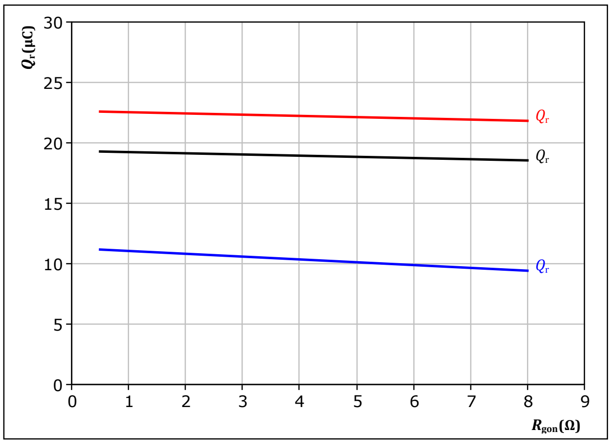
With an inductive load at

V_{CE} =	600	V	T_j: 25 °C / 125 °C / 150 °C
V_{GE} =	±15	V	
R_{gon} =	2	Ω	

figure 27. FWD

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

Q_r = f(R_{gon})



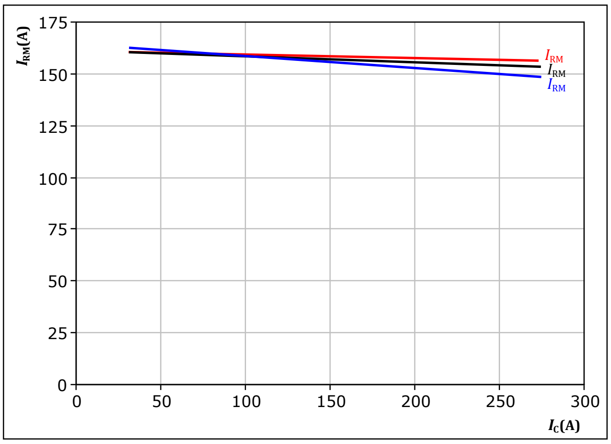
With an inductive load at

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

figure 28. FWD

Typical peak reverse recovery current as a function of collector current

I_{RM} = f(I_C)



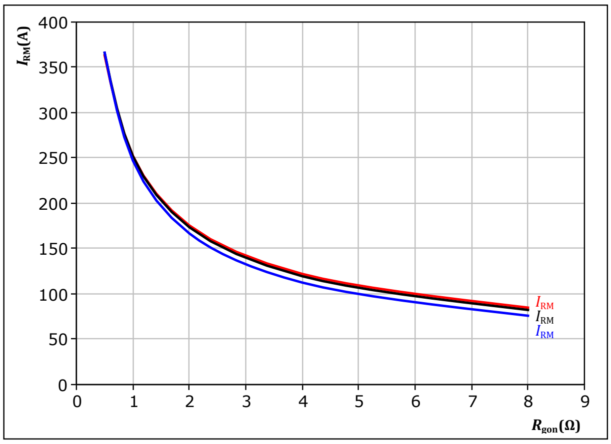
With an inductive load at

V_{CE} =	600	V	T_j: 25 °C / 125 °C / 150 °C
V_{GE} =	±15	V	
R_{gon} =	2	Ω	

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

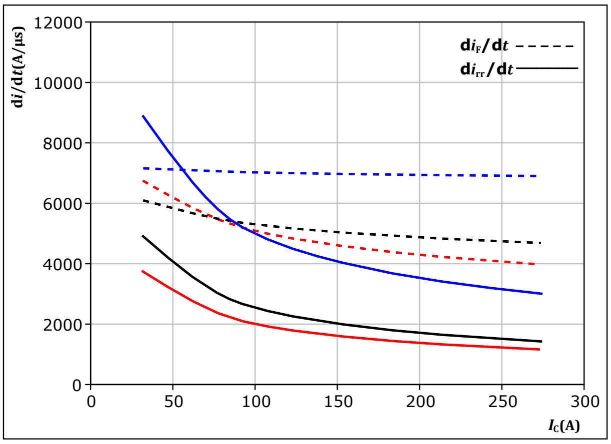
V_{CE} =	600	V	T_j: 25 °C / 125 °C / 150 °C
V_{GE} =	±15	V	
I_C =	150	A	

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)



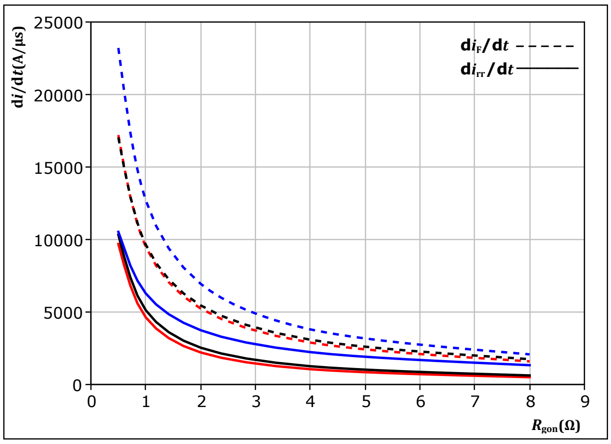
With an inductive load at

V_{CE} =	600	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
R_{gon} =	2	Ω		150 °C

figure 31. **FWD**

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

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



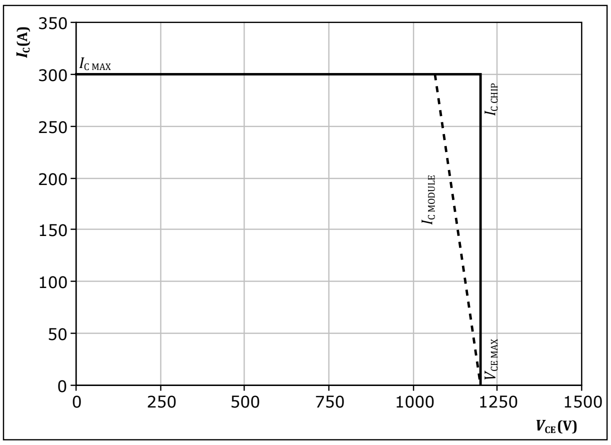
With an inductive load at

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

figure 32. **IGBT**

Reverse bias safe operating area

I_C = f(V_{CE})



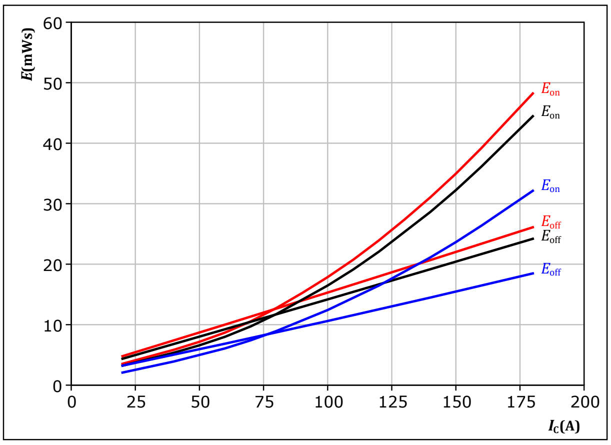
At	T_j =	150	°C
	R_{gon} =	2	Ω
	R_{goff} =	2	Ω

Brake Switching Characteristics

figure 33. **IGBT**

Typical switching energy losses as a function of collector current

$E = f(I_C)$



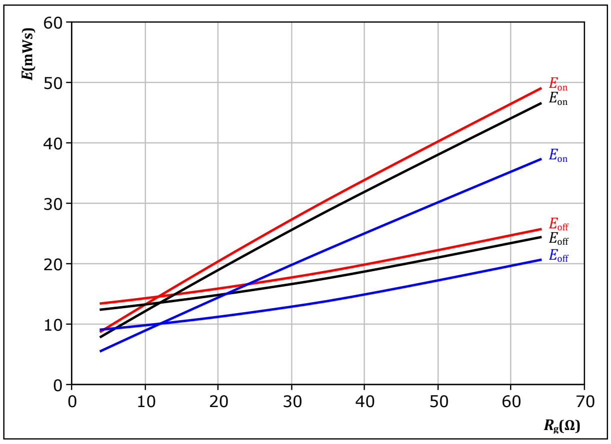
With an inductive load at

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

figure 34. **IGBT**

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

$E = f(R_g)$



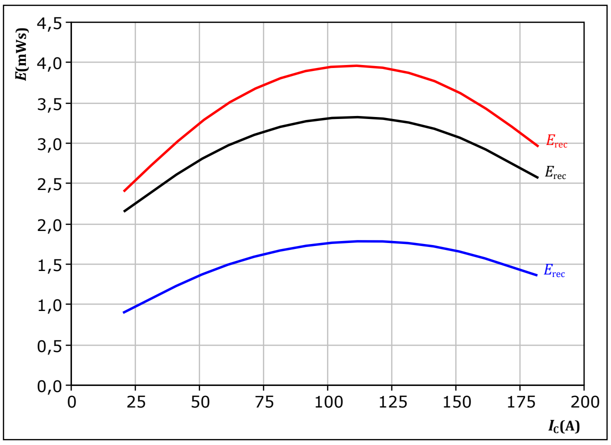
With an inductive load at

V_{CE} =	700	V	T_j:	25 °C
V_{GE} =	0/15	V		125 °C
I_C =	100	A		150 °C

figure 35. **FWD**

Typical reverse recovered energy loss as a function of collector current

$E_{rec} = f(I_C)$



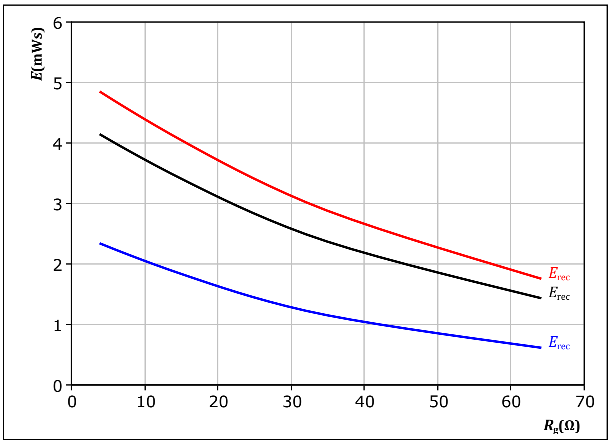
With an inductive load at

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

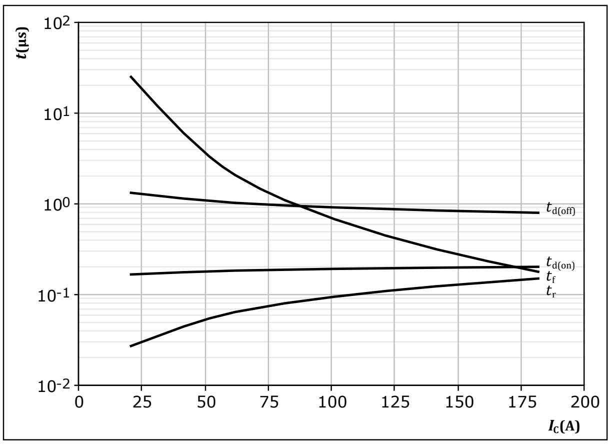
V_{CE} =	700	V	T_j:	25 °C
V_{GE} =	0/15	V		125 °C
I_C =	100	A		150 °C

Brake Switching Characteristics

figure 37. **IGBT**

Typical switching times as a function of collector current

$t = f(I_C)$



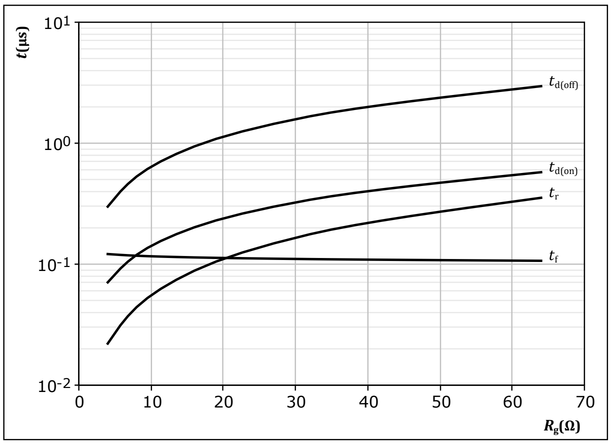
With an inductive load at

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

$t = f(R_g)$



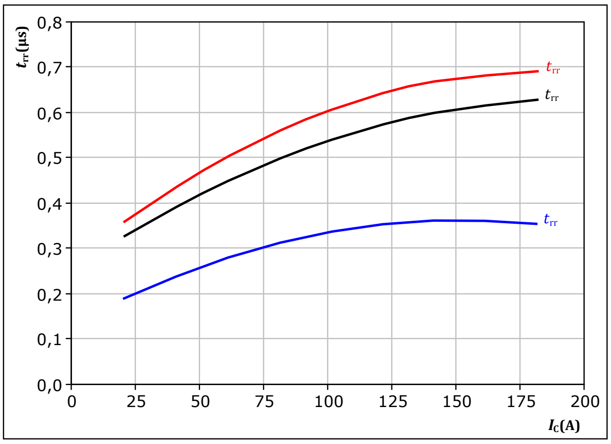
With an inductive load at

T_j =	150	°C
V_{CE} =	700	V
V_{GE} =	0/15	V
I_C =	100	A

figure 39. **FWD**

Typical reverse recovery time as a function of collector current

$t_{rr} = f(I_C)$



With an inductive load at

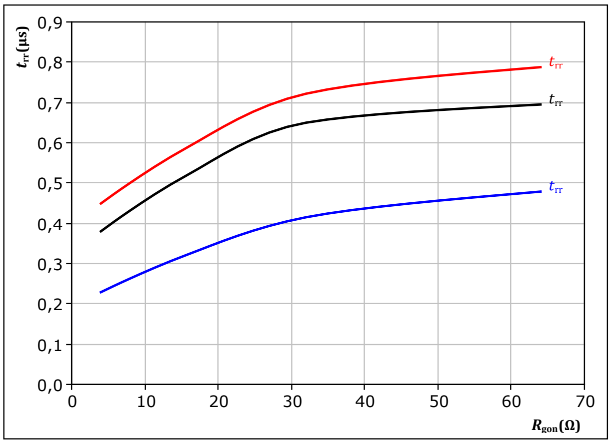
V_{CE} =	700	V
V_{GE} =	0/15	V
R_{gon} =	16	Ω

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 =	100	A

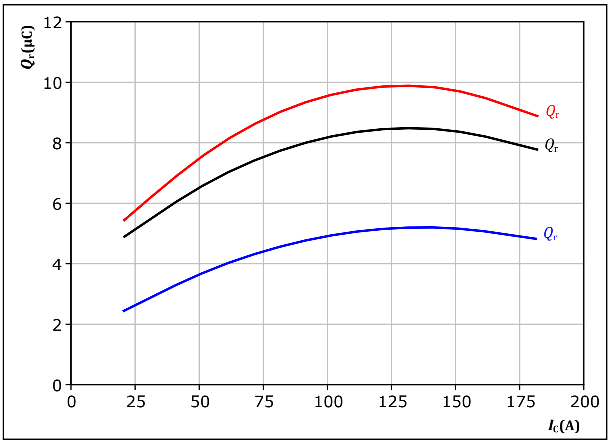
T_j: 25 °C, 125 °C, 150 °C

Brake Switching Characteristics

figure 41. FWD

Typical recovered charge as a function of collector current

Q_r = f(I_C)



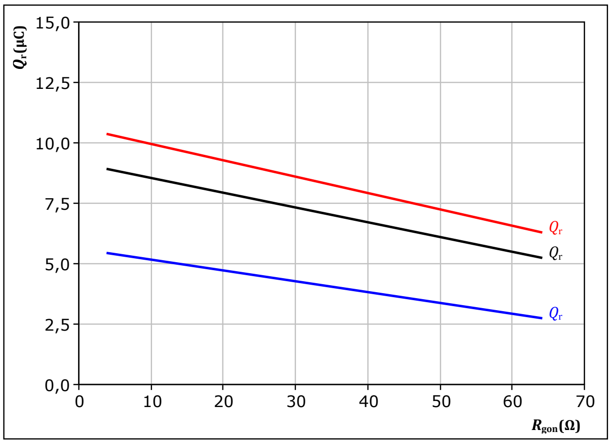
With an inductive load at

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

figure 42. FWD

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

Q_r = f(R_{gon})



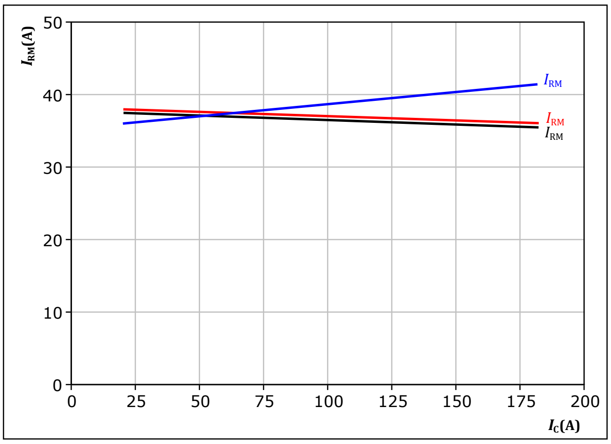
With an inductive load at

V_{CE} =	700	V	T_j:	25 °C
V_{GE} =	0/15	V		125 °C
I_C =	100	A		150 °C

figure 43. FWD

Typical peak reverse recovery current as a function of collector current

I_{RM} = f(I_C)



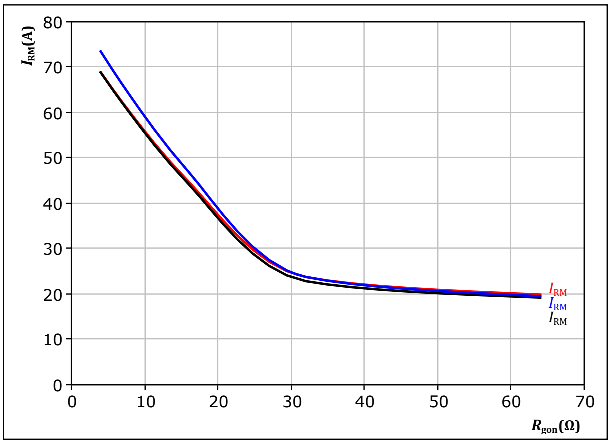
With an inductive load at

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

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

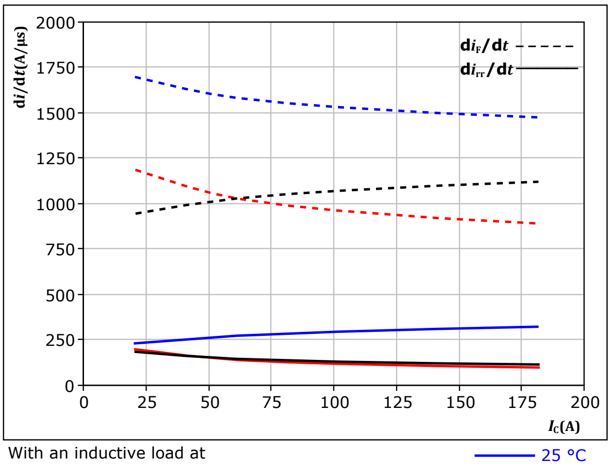
V_{CE} =	700	V	T_j:	25 °C
V_{GE} =	0/15	V		125 °C
I_C =	100	A		150 °C

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)



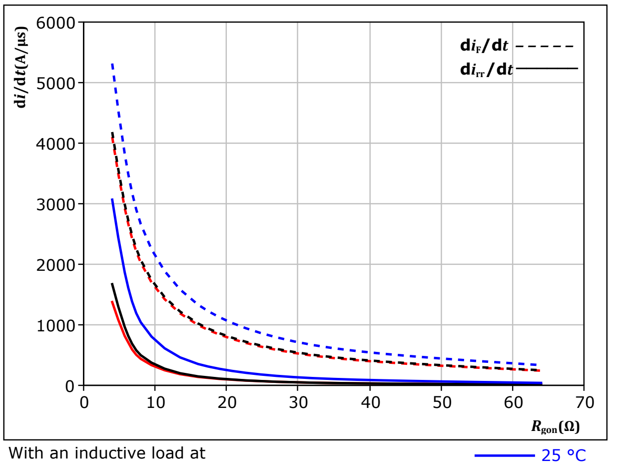
With an inductive load at

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



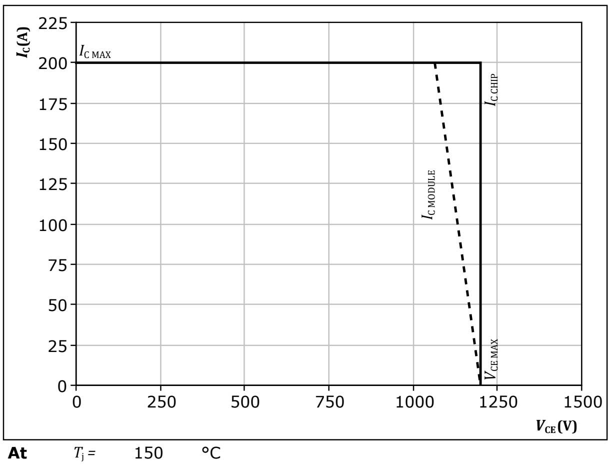
With an inductive load at

V_{CE} =	700	V	T_j:	25 °C
V_{GE} =	0/15	V		125 °C
I_C =	100	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})

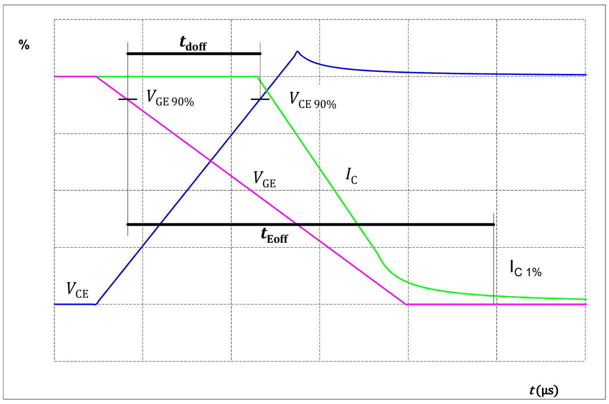


figure 49. **IGBT**

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

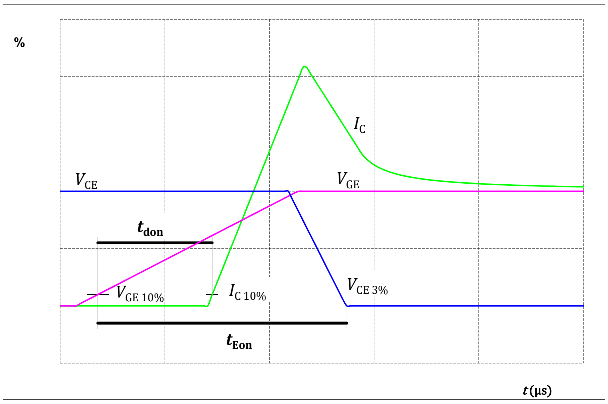


figure 50. **IGBT**

Turn-off Switching Waveforms & definition of t_f

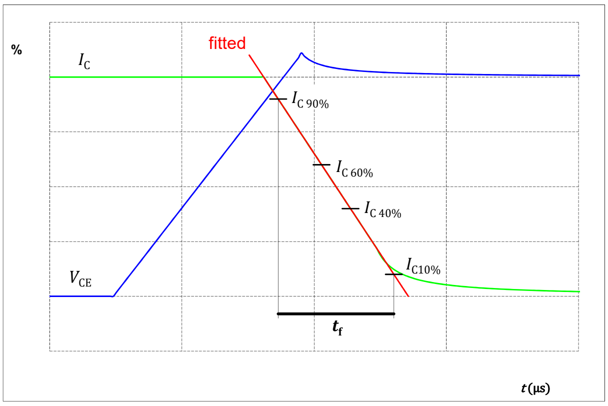
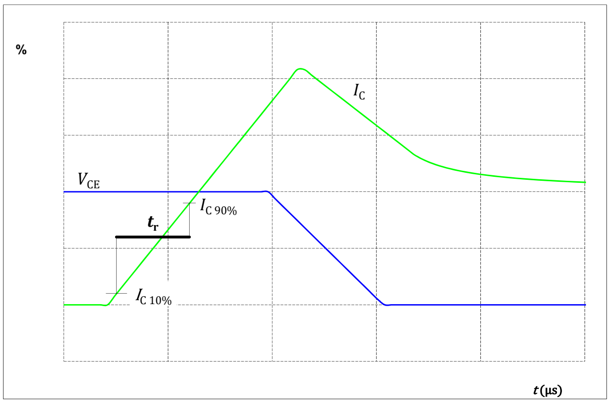


figure 51. **IGBT**

Turn-on Switching Waveforms & definition of t_r



Switching Definitions

figure 52. **FWD**

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

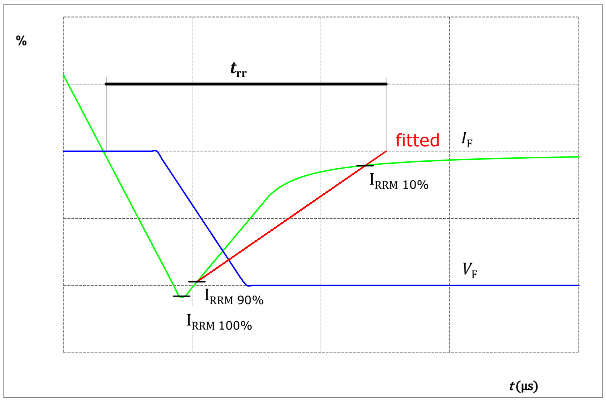
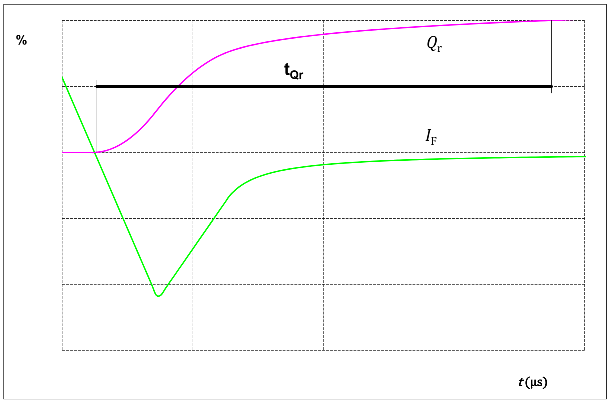


figure 53. **FWD**

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



A0-VP12PMA150RA-LF18A80T
datasheet

Vincotech

Ordering Code

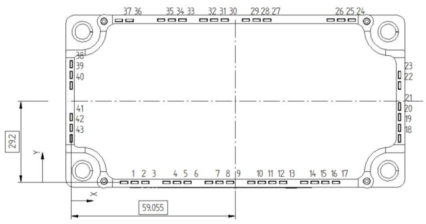
Version	Ordering Code
Without thermal paste	A0-VP12PMA150RA-LF18A80T
With thermal paste (5,2 W/mK, PTM6000HV)	A0-VP12PMA150RA-LF18A80T-/7/

Marking

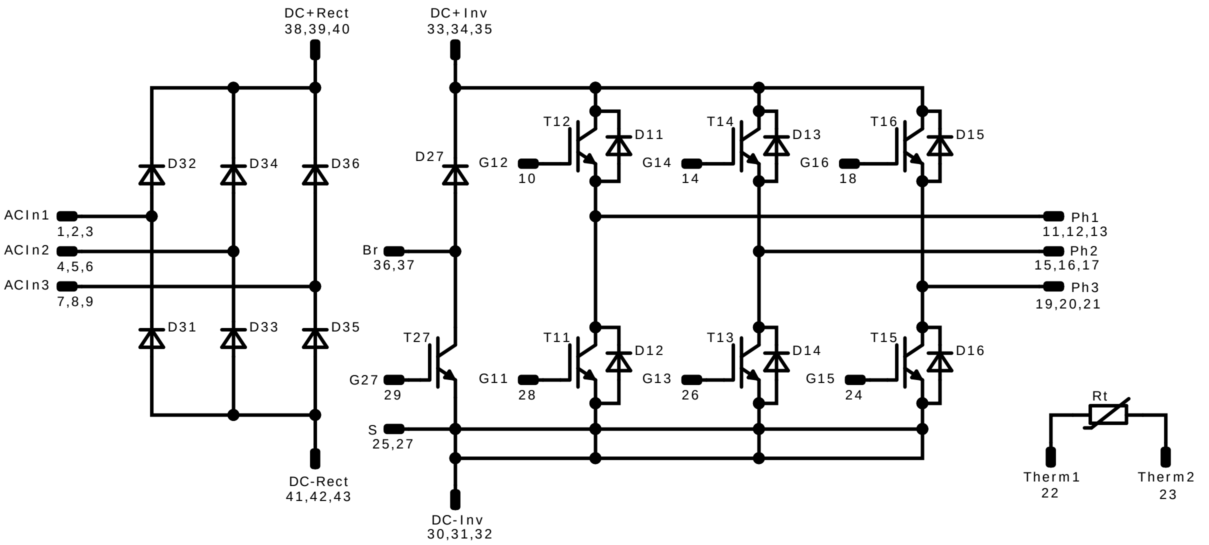
	Text	**Name**		**VIN**	**Date code**	**Lot**	**Serial**
		NN-NNNNNNNNNNNNNN-TTTTTTTVV		VIN	WWYY	LLLLL	SSSS
	Datamatrix	**Type&Ver**	**Lot number**	**Serial**	**Date code**		
		TTTTTTTVV	LLLLL	SSSS	WWYY		

Outline

Pin table [mm]			
Pin	X	Y	Function
1	19,05	0	ACIn1
2	22,86	0	ACIn1
3	26,66	0	ACIn1
4	34,29	0	ACIn2
5	38,1	0	ACIn2
6	41,91	0	ACIn2
7	49,53	0	ACIn3
8	53,34	0	ACIn3
9	57,16	0	ACIn3
10	64,77	0	G12
11	68,58	0	Ph1
12	72,36	0	Ph1
13	76,16	0	Ph1
14	83,82	0	G14
15	87,56	0	Ph2
16	91,45	0	Ph2
17	95,26	0	Ph2
18	118,11	15,865	G16
19	118,11	19,675	Ph3
20	118,11	23,485	Ph3
21	118,11	27,235	Ph3
22	118,11	34,915	Therm1
23	118,11	38,725	Therm2
24	100,965	58,4	G15
25	97,155	58,4	S
26	93,305	58,4	G13
27	70,505	58,4	S
28	66,655	58,4	G11
29	62,855	58,4	G27
30	55,205	58,4	DC-Inv
31	51,395	58,4	DC-Inv
32	47,585	58,4	DC-Inv
33	39,995	58,4	DC+Inv
34	36,195	58,4	DC+Inv
35	32,385	58,4	DC+Inv
36	20,975	58,4	Br
37	17,175	58,4	Br
38	0	42,535	DC+Rect
39	0	38,725	DC+Rect
40	0	34,915	DC+Rect
41	0	23,485	DC-Rect
42	0	19,675	DC-Rect
43	0	15,865	DC-Rect



Pinout



Identification

ID	Component	Voltage	Current	Function	Comment
T11, T12, T13, T14, T15, T16	IGBT	1200 V	150 A	Inverter Switch	
D11, D12, D13, D14, D15, D16	FWD	1200 V	150 A	Inverter Diode	
T27	IGBT	1200 V	100 A	Brake Switch	
D27	FWD	1200 V	50 A	Brake Diode	
D31, D32, D33, D34, D35, D36	Rectifier	1600 V	110 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-VP12PMA150RA-LF18A80T-D1-14	23 Jan. 2026	Initial Release	

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2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.