B0-SL103BB100S774-PB80L95Z
datasheet

Vincotech

***flow*BOOST S3 triple** **950 V / 100 A**

Topology features

- Kelvin Emitter for improved switching performance
- Temperature sensor
- Triple Flying Cap Booster
- Auxiliary diodes for FC pre-charge (patent pending)

Component features

- Low collector emitter saturation voltage
- High speed and smooth switching

Housing features

- Base isolation: Al_2O_3
- CTI600 housing material
- Compact, baseplate-less housing
- VINcoPress Technology
- Thermo-mechanical push-and-pull force relief
- Solder pin

Target applications

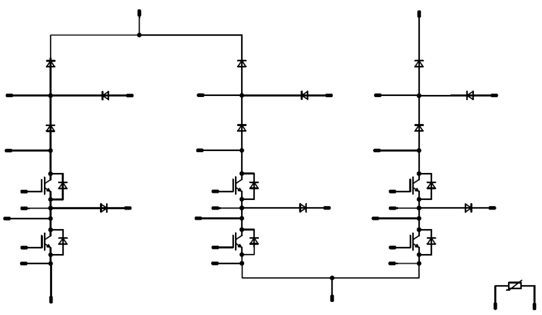
- Energy Storage Systems
- Solar Inverters

Types

- B0-SL103BB100S774-PB80L95Z

flow S3 12 mm housing

Schematic



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Maximum Ratings

T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Conditions		Value	Unit
Inner Boost Switch					
Collector-emitter voltage	V_{CES}			950	V
Collector current (DC current)	I_C	$T_j = T_{jmax}$	T_s = 80 °C	77	A
Repetitive peak collector current	I_{CRM}	t_p limited by T_{jmax}		200	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$	T_s = 80 °C	145	W
Gate-emitter voltage	V_{GES}			±20	V
Maximum junction temperature	T_{jmax}			175	°C
Inner Boost Diode					
Peak repetitive reverse voltage	V_{RRM}			1200	V
Forward current (DC current)	I_F	$T_j = T_{jmax}$	T_s = 80 °C	71	A
Repetitive peak forward current	I_{FRM}	t_p limited by T_{jmax}		120	A
Surge (non-repetitive) forward current	I_{FSM}	t_p = 10 µs	T_j = 25 °C	3000	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$	T_s = 80 °C	159	W
Maximum junction temperature	T_{jmax}			175	°C
Inner Boost Sw. Protection Diode					
Peak repetitive reverse voltage	V_{RRM}			1200	V
Forward current (DC current)	I_F	$T_j = T_{jmax}$	T_s = 80 °C	49	A
Repetitive peak forward current	I_{FRM}	t_p limited by T_{jmax}		100	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$	T_s = 80 °C	90	W
Maximum junction temperature	T_{jmax}			175	°C

Maximum Ratings

T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Conditions		Value	Unit
Outer Boost Switch					
Collector-emitter voltage	V_{CES}			950	V
Collector current (DC current)	I_C	$T_j = T_{jmax}$	T_s = 80 °C	77	A
Repetitive peak collector current	I_{CRM}	t_p limited by T_{jmax}		200	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$	T_s = 80 °C	145	W
Gate-emitter voltage	V_{GES}			±20	V
Maximum junction temperature	T_{jmax}			175	°C
Outer Boost Diode					
Peak repetitive reverse voltage	V_{RRM}			1200	V
Forward current (DC current)	I_F	$T_j = T_{jmax}$	T_s = 80 °C	71	A
Repetitive peak forward current	I_{FRM}	t_p limited by T_{jmax}		120	A
Surge (non-repetitive) forward current	I_{FSM}	t_p = 10 µs	T_j = 25 °C	3000	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$	T_s = 80 °C	159	W
Maximum junction temperature	T_{jmax}			175	°C
Outer Boost Sw. Protection Diode					
Peak repetitive reverse voltage	V_{RRM}			1200	V
Forward current (DC current)	I_F	$T_j = T_{jmax}$	T_s = 80 °C	49	A
Repetitive peak forward current	I_{FRM}	t_p limited by T_{jmax}		100	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$	T_s = 80 °C	90	W
Maximum junction temperature	T_{jmax}			175	°C

Maximum Ratings

T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Conditions		Value	Unit
Aux Diode H					
Peak repetitive reverse voltage	V_{RRM}			1200	V
Forward current (DC current)	I_F	$T_j = T_{jmax}$	T_s = 80 °C	32	A
Surge (non-repetitive) forward current	I_{FSM}	Single Half Sine Wave, t_p = 10 ms	T_j = 150 °C	170	A
Surge current capability	I^2t			145	A^2s
Total power dissipation	P_{tot}	$T_j = T_{jmax}$	T_s = 80 °C	73	W
Maximum junction temperature	T_{jmax}			175	°C
Aux Diode L					
Peak repetitive reverse voltage	V_{RRM}			1200	V
Forward current (DC current)	I_F	$T_j = T_{jmax}$	T_s = 80 °C	32	A
Surge (non-repetitive) forward current	I_{FSM}	Single Half Sine Wave, t_p = 10 ms	T_j = 150 °C	170	A
Surge current capability	I^2t			145	A^2s
Total power dissipation	P_{tot}	$T_j = T_{jmax}$	T_s = 80 °C	73	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	6000	V
Creepage distance				11,51	mm
Clearance				8,26	mm
Comparative Tracking Index	CTI			≥ 600	

*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
Inner Boost Switch										
Static										
Gate-emitter threshold voltage	$V_{GE(th)}$	$V_{CE} = V_{GE}$			0,00167	25	4,35	5,1	5,85	V
Collector-emitter saturation voltage	V_{CEsat}		15		100	25 125 150		1,67 1,94 2,01	2,35(1)	V
Collector-emitter cut-off current	I_{CES}		0	950		25			2	µA
Gate-emitter leakage current	I_{GES}		20	0		25			100	nA
Internal gate resistance	r_g							1,5		Ω
Input capacitance	C_{ies}	f = 100 kHz	0	25		25		6500		pF
Output capacitance	C_{oes}							139		pF
Reverse transfer capacitance	C_{res}							20		pF
Gate charge	Q_g		±15		0	25		230		nC
Thermal										
Thermal resistance junction to sink(2)	$R_{th(j-s)}$	λ_{paste} = 5,2 W/mK (PTM)						0,66		K/W
Dynamic										
Turn-on delay time	$t_{d(on)}$	R_{gon} = 4 Ω R_{goff} = 4 Ω	±15	600	100	25 125 150		96,03 98,3 98,96		ns
Rise time	t_r					25 125 150		16,03 17,54 17,73		ns
Turn-off delay time	$t_{d(off)}$					25 125 150		101,63 124,55 129,85		ns
Fall time	t_f					25 125 150		25,24 58,23 68,7		ns
Turn-on energy (per pulse)	E_{on}	Q_{rFWD}=0,241 µC Q_{rFWD}=0,266 µC Q_{rFWD}=0,27 µC				25 125 150		2,26 2,34 2,32		mWs
Turn-off energy (per pulse)	E_{off}					25 125 150		2,43 4,43 4,9		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	
Inner Boost Diode										
Static										
Forward voltage	V_F				60	25 125 150		1,5 1,83 1,96	1,65(1) 2,3(1)	V
Reverse leakage current	I_R	V_r = 1200 V				25 150		3 75	300 3000	μA
Thermal										
Thermal resistance junction to sink(2)	$R_{th(j-s)}$	λ_{paste} = 5,2 W/mK (PTM)						0,6		K/W
Dynamic										
Peak recovery current	I_{RM}	di/dt=3944 A/μs di/dt=2786 A/μs di/dt=4219 A/μs	±15	600	100	25 125 150		24,2 26,51 27,28		A
Reverse recovery time	t_{rr}					25 125 150		17,09 16,9 16,64		ns
Recovered charge	Q_r					25 125 150		0,241 0,266 0,27		μC
Reverse recovered energy	E_{rec}					25 125 150		0,051 0,06 0,061		mWs
Peak rate of fall of recovery current	$(di_{rf}/dt)_{max}$					25 125 150		3464,07 4803,44 4127,51		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	
Inner Boost Sw. Protection Diode										
Static										
Forward voltage	V_F				50	25 125 150		1,66 1,78 1,79	2,1[(1)]	V
Reverse leakage current	I_R	V_r = 1200 V				25			40	µA
Thermal										
Thermal resistance junction to sink[(2)]	$R_{th(j-s)}$	λ_{paste} = 5,2 W/mK (PTM)						1,06		K/W

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
Outer Boost Switch										
Static										
Gate-emitter threshold voltage	$V_{GE(th)}$	$V_{CE} = V_{GE}$			0,00167	25	4,35	5,1	5,85	V
Collector-emitter saturation voltage	V_{CEsat}		15		100	25 125 150		1,67 1,94 2,01	2,35(1)	V
Collector-emitter cut-off current	I_{CES}		0	950		25			2	µA
Gate-emitter leakage current	I_{GES}		20	0		25			100	nA
Internal gate resistance	r_g							1,5		Ω
Input capacitance	C_{ies}							6500		pF
Output capacitance	C_{oes}	f = 100 kHz	0	25		25		139		pF
Reverse transfer capacitance	C_{res}							20		pF
Gate charge	Q_g		±15		0	25		230		nC
Thermal										
Thermal resistance junction to sink(2)	$R_{th(j-s)}$	λ_{paste} = 5,2 W/mK (PTM)						0,66		K/W
Dynamic										
Turn-on delay time	$t_{d(on)}$					25 125 150		96,38 97,88 98,59		ns
Rise time	t_r	R_{gon} = 4 Ω R_{goff} = 4 Ω				25 125 150		13,94 15,75 16,16		ns
Turn-off delay time	$t_{d(off)}$					25 125 150		100,31 125,84 132,45		ns
Fall time	t_f		±15	600	100	25 125 150		25,83 51,84 61,81		ns
Turn-on energy (per pulse)	E_{on}	Q_{rFWD}=0,493 µC Q_{rFWD}=0,499 µC Q_{rFWD}=0,496 µC				25 125 150		1,64 1,85 1,88		mWs
Turn-off energy (per pulse)	E_{off}					25 125 150		2,22 3,95 4,5		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
Outer Boost Diode										
Static										
Forward voltage	V_F				60	25 125 150		1,5 1,83 1,96	1,65(1) 2,3(1)	V
Reverse leakage current	I_R	V_r = 1200 V				25 150		3 75	300 3000	µA
Thermal										
Thermal resistance junction to sink(2)	$R_{th(j-s)}$	λ_{paste} = 5,2 W/mK (PTM)						0,6		K/W
Dynamic										
Peak recovery current	I_{RM}	d*i*/d*t*=4657 A/µs d*i*/d*t*=5886 A/µs d*i*/d*t*=5512 A/µs	±15	600	100	25 125 150		45,1 43,42 43,41		A
Reverse recovery time	t_{rr}					25 125 150		18,29 18,8 18,83		ns
Recovered charge	Q_r					25 125 150		0,493 0,499 0,496		µC
Reverse recovered energy	E_{rec}					25 125 150		0,135 0,142 0,143		mWs
Peak rate of fall of recovery current	$(di_{rf}/dt)_{max}$					25 125 150		7319,51 6647,13 6743,96		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	
Outer Boost Sw. Protection Diode										
Static										
Forward voltage	V_F				50	25 125 150		1,66 1,78 1,79	2,1(1)	V
Reverse leakage current	I_R	V_r = 1200 V				25			40	µA
Thermal										
Thermal resistance junction to sink(2)	$R_{th(j-s)}$	λ_{paste} = 5,2 W/mK (PTM)						1,06		K/W
Aux Diode H										
Static										
Forward voltage	V_F				35	25 150		2,37 2,35	2,62(1) 2,62(1)	V
Reverse leakage current	I_R	V_r = 1200 V				25 150		 2700	60 5500	µA
Thermal										
Thermal resistance junction to sink(2)	$R_{th(j-s)}$	λ_{paste} = 5,2 W/mK (PTM)						1,31		K/W
Aux Diode L										
Static										
Forward voltage	V_F				35	25 150		2,37 2,35	2,62(1) 2,62(1)	V
Reverse leakage current	I_R	V_r = 1200 V				25 150		 2700	60 5500	µA
Thermal										
Thermal resistance junction to sink(2)	$R_{th(j-s)}$	λ_{paste} = 5,2 W/mK (PTM)						1,31		K/W

Characteristic Values

Parameter	Symbol	Conditions					Values			Unit
			V_{GE} [V] V_{GS} [V]	V_{CE} [V] V_{DS} [V] V_F [V]	I_C [A] I_D [A] I_F [A]	T_j [°C]	Min	Typ	Max	
Thermistor										
Static										
Rated resistance	R					25		22		kΩ
Deviation of R100	$\Delta_{R/R}$	R_{100} = 1484 Ω				100	-5		5	%
Power dissipation	P					25		130		mW
Power dissipation constant	d					25		1,5		mW/K
B-value	$B_{(25/50)}$	Tol. ±1 %						3962		K
B-value	$B_{(25/100)}$	Tol. ±1 %						4000		K
Vincotech Thermistor Reference									I	

(1) Value at chip level

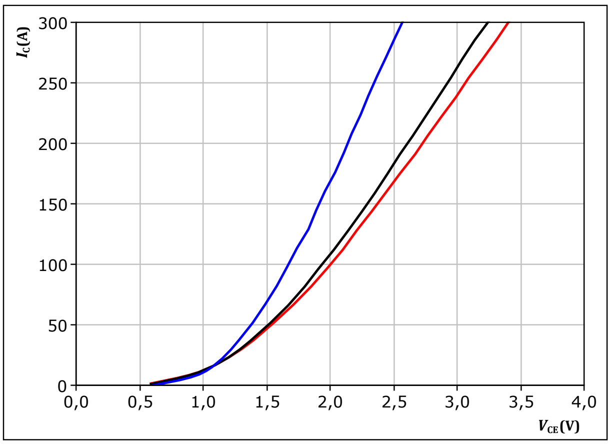
(2) Only valid with pre-applied Vincotech thermal interface material.

Inner Boost Switch Characteristics

figure 1. **IGBT**

Typical output characteristics

I_C = f(V_{CE})

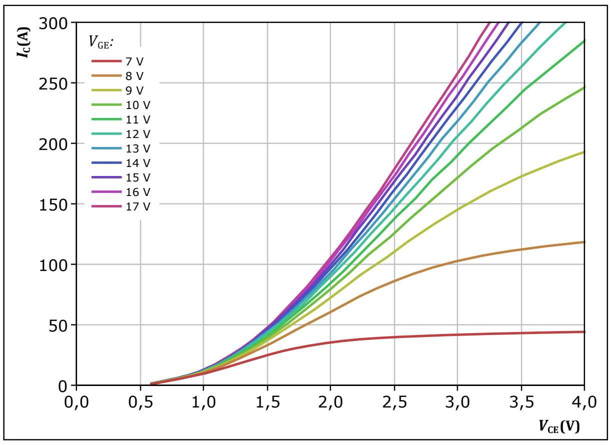


t_p =	250	µs		25 °C
V_{GE} =	15	V	T_j:	125 °C
				150 °C

figure 2. **IGBT**

Typical output characteristics

I_C = f(V_{CE})



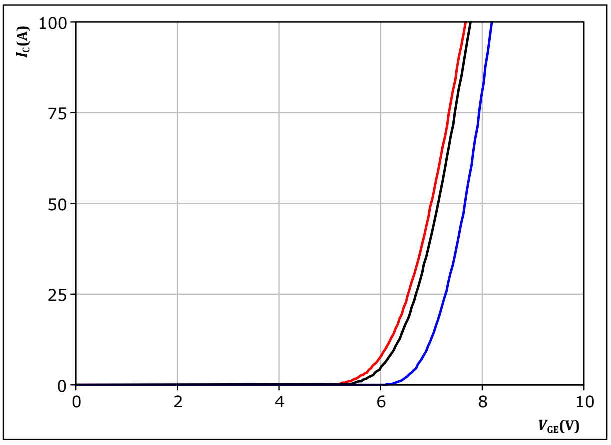
t_p =	250	µs
T_j =	150	°C

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

figure 3. **IGBT**

Typical transfer characteristics

I_C = f(V_{GE})

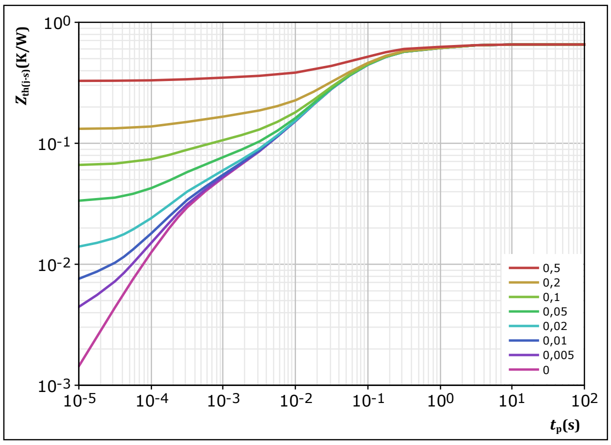


t_p =	250	µs		25 °C
V_{CE} =	10	V	T_j:	125 °C
				150 °C

figure 4. **IGBT**

Transient thermal impedance as a function of pulse width

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



D =	t_p / T	
$R_{th(j-s)}$ =	0,656	K/W

IGBT thermal model values

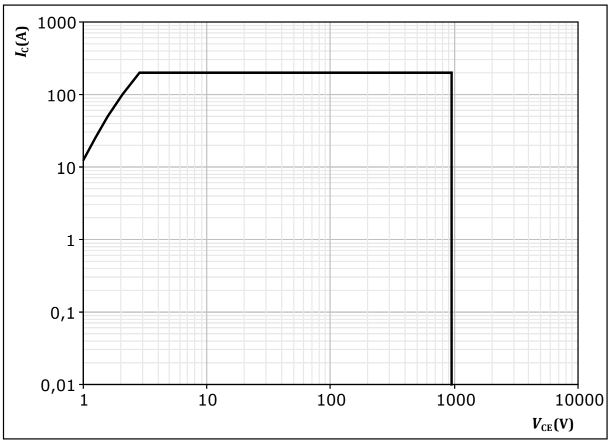
R (K/W)	τ (s)
8,75E-02	1,42E+00
3,39E-01	1,02E-01
1,74E-01	2,16E-02
2,53E-02	1,80E-03
3,08E-02	2,55E-04

Inner Boost Switch Characteristics

figure 5. **IGBT**

Safe operating area

I_C = f(V_{CE})



D = single pulse

T_s = 80 °C

V_{GE} = 15 V

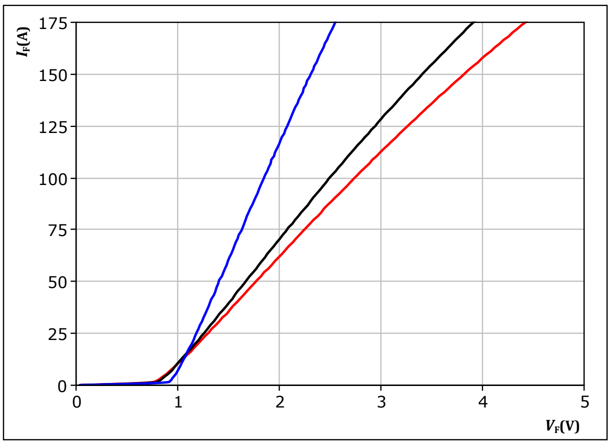
T_j = T_{jmax}

Inner Boost Diode Characteristics

figure 6. **FWD**

Typical forward characteristics

$I_F = f(V_F)$



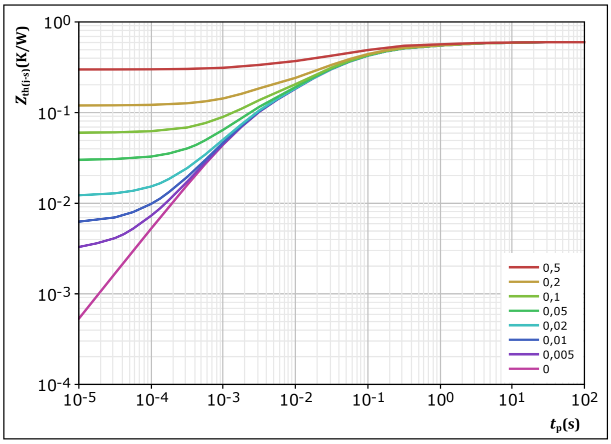
t_p = 250 µs

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

$R_{th(j-s)}$ = 0,598 K/W

FWD thermal model values

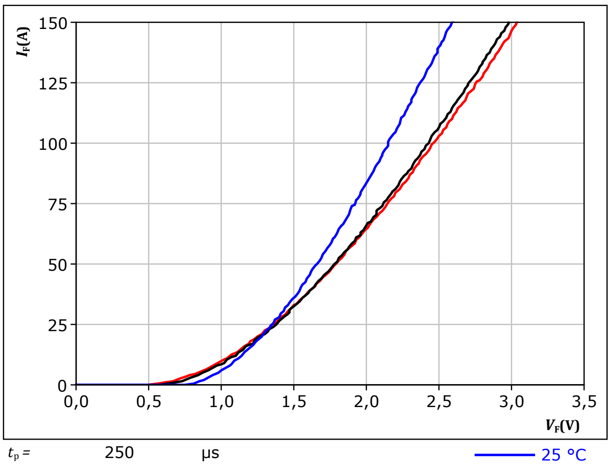
R (K/W)	τ (s)
2,92E-02	6,08E+00
7,48E-02	8,66E-01
2,30E-01	9,12E-02
1,82E-01	1,80E-02
8,20E-02	2,02E-03

Inner Boost Sw. Protection Diode Characteristics

figure 8. **FWD**

Typical forward characteristics

I_F = f(V_F)



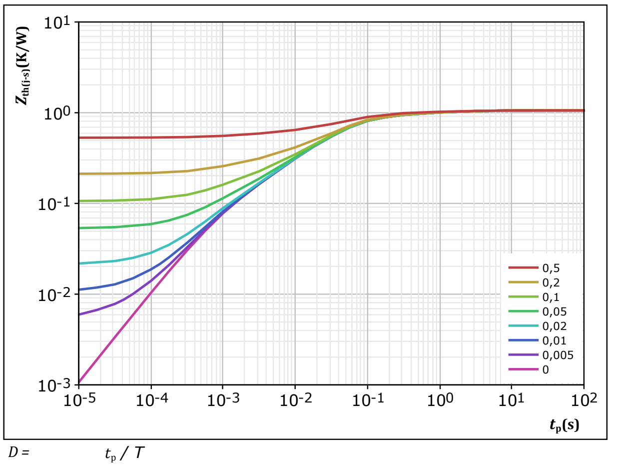
t_p = 250 µs

T_j: 25 °C, 125 °C, 150 °C

figure 9. **FWD**

Transient thermal impedance as a function of pulse width

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



D = t_p / T

$R_{th(j-s)}$ = 1,061 K/W

FWD thermal model values

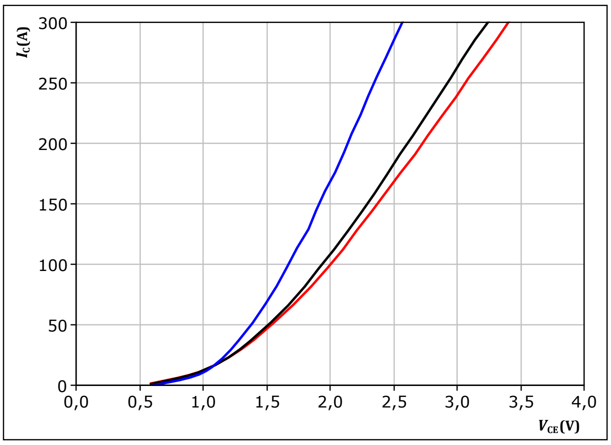
R (K/W)	τ (s)
6,96E-02	2,39E+00
1,22E-01	3,75E-01
6,12E-01	5,08E-02
1,89E-01	8,26E-03
6,78E-02	9,42E-04

Outer Boost Switch Characteristics

figure 10. **IGBT**

Typical output characteristics

I_C = f(V_{CE})

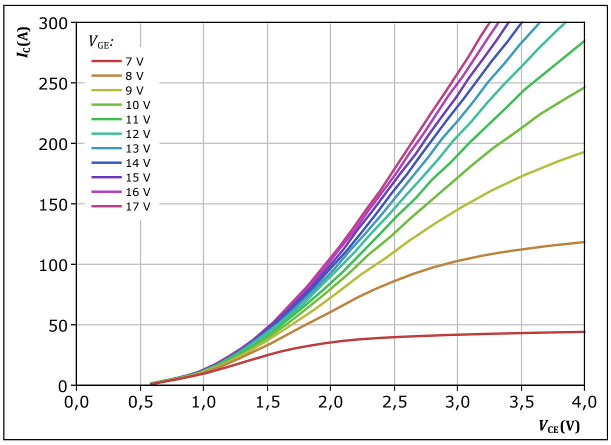


t_p =	250	µs		25 °C
V_{GE} =	15	V	T_j:	125 °C
				150 °C

figure 11. **IGBT**

Typical output characteristics

I_C = f(V_{CE})



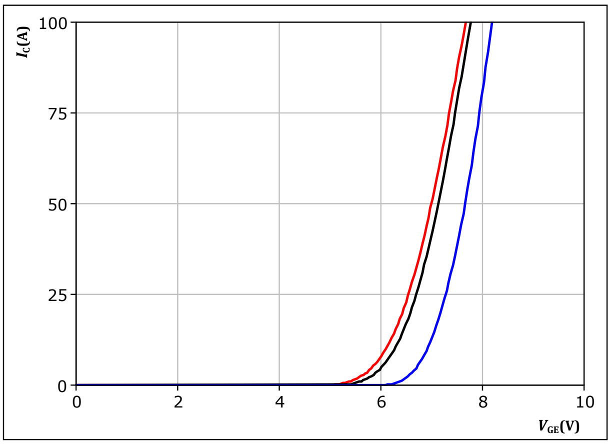
t_p =	250	µs
T_j =	150	°C

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

figure 12. **IGBT**

Typical transfer characteristics

I_C = f(V_{GE})

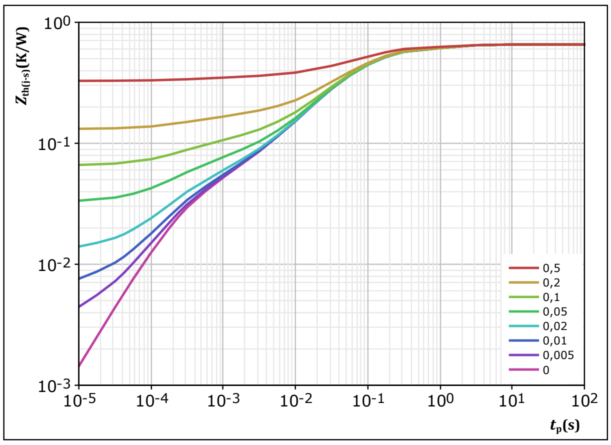


t_p =	250	µs		25 °C
V_{CE} =	10	V	T_j:	125 °C
				150 °C

figure 13. **IGBT**

Transient thermal impedance as a function of pulse width

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



D =	t_p / T	
$R_{th(j-s)}$ =	0,656	K/W

IGBT thermal model values

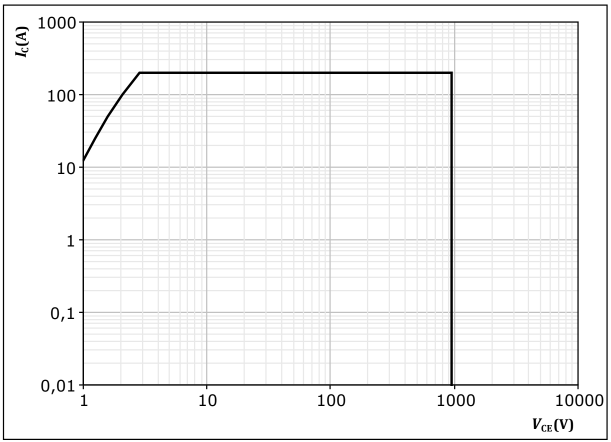
R (K/W)	τ (s)
8,75E-02	1,42E+00
3,39E-01	1,02E-01
1,74E-01	2,16E-02
2,53E-02	1,80E-03
3,08E-02	2,55E-04

Outer Boost Switch Characteristics

figure 14.	IGBT

Safe operating area

$I_C = f(V_{CE})$



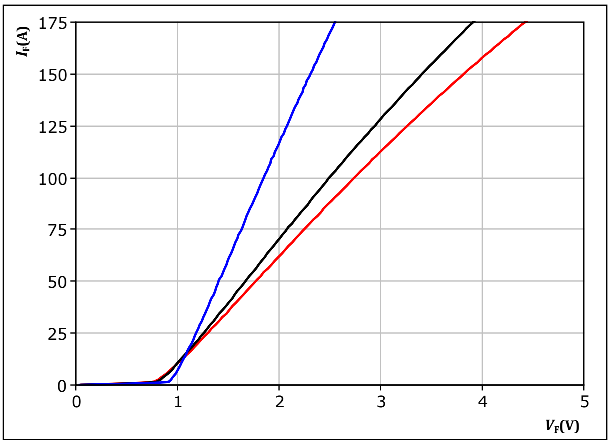
D =	single pulse	
T_s =	80	°C
V_{GE} =	15	V
T_j =	T_{jmax}	

Outer Boost Diode Characteristics

figure 15. FWD

Typical forward characteristics

I_F = f(V_F)



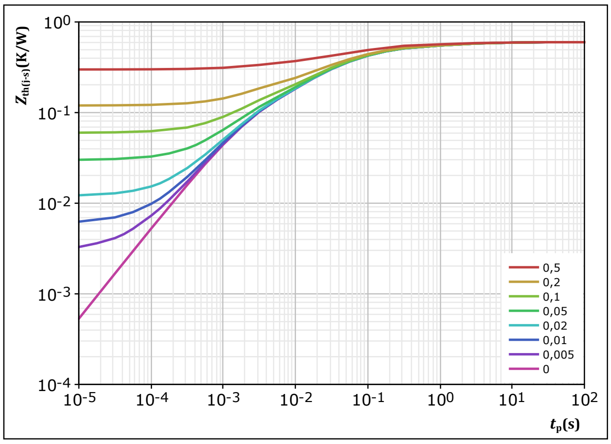
t_p = 250 µs

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

$R_{th(j-s)}$ = 0,598 K/W

FWD thermal model values

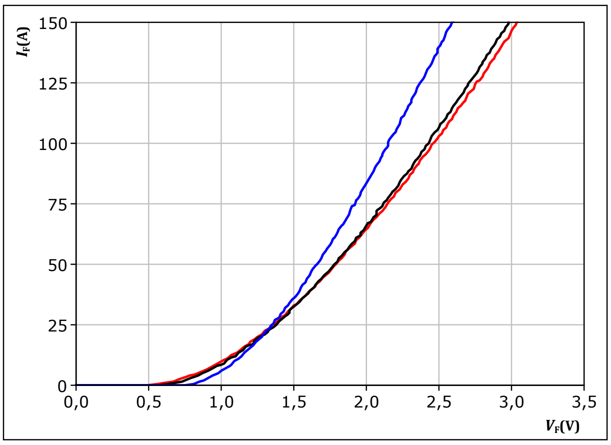
R (K/W)	τ (s)
2,92E-02	6,08E+00
7,48E-02	8,66E-01
2,30E-01	9,12E-02
1,82E-01	1,80E-02
8,20E-02	2,02E-03

Outer Boost Sw. Protection Diode Characteristics

figure 17. **FWD**

Typical forward characteristics

$I_F = f(V_F)$



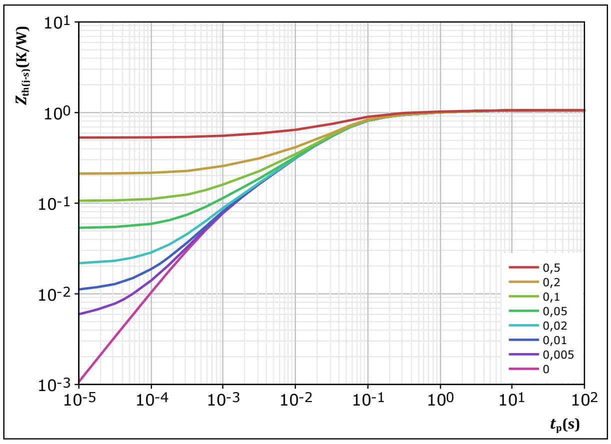
t_p = 250 µs

T_j: 25 °C, 125 °C, 150 °C

figure 18. **FWD**

Transient thermal impedance as a function of pulse width

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



D = t_p / T

$R_{th(j-s)}$ = 1,061 K/W

FWD thermal model values

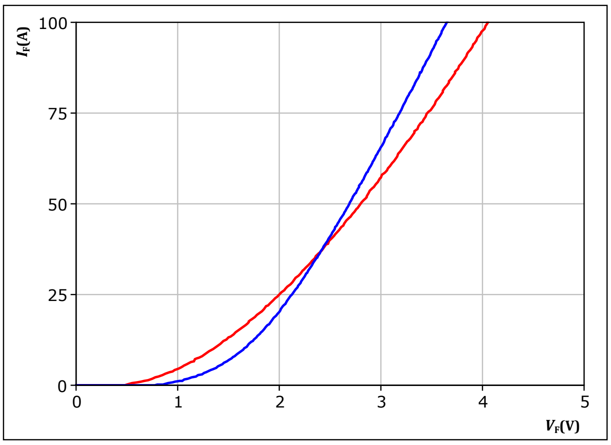
R (K/W)	τ (s)
6,96E-02	2,39E+00
1,22E-01	3,75E-01
6,12E-01	5,08E-02
1,89E-01	8,26E-03
6,78E-02	9,42E-04

Aux Diode H Characteristics

figure 19. **FWD**

Typical forward characteristics

I_F = f(V_F)



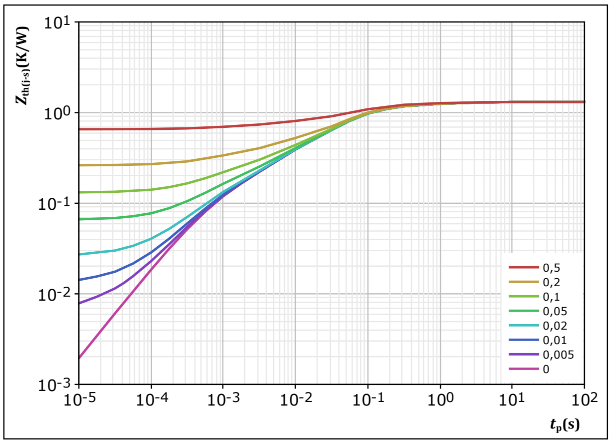
t_p = 250 µs

T_j: 25 °C, 150 °C

figure 20. **FWD**

Transient thermal impedance as a function of pulse width

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



D = t_p / T

$R_{th(j-s)}$ = 1,308 K/W

FWD thermal model values

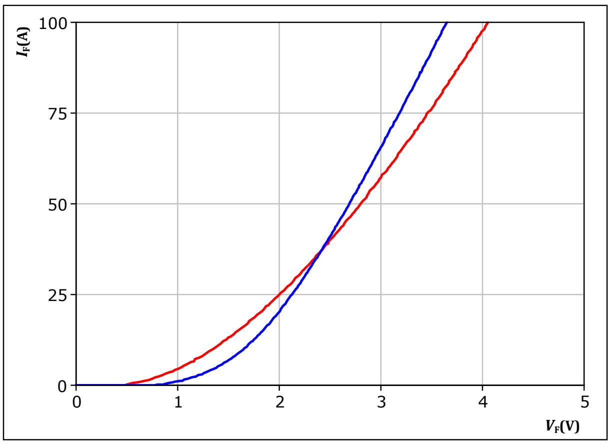
R (K/W)	τ (s)
9,18E-02	1,91E+00
2,59E-01	2,04E-01
6,72E-01	4,91E-02
1,98E-01	5,31E-03
8,79E-02	6,11E-04

Aux Diode L Characteristics

figure 21. FWD

Typical forward characteristics

I_F = f(V_F)



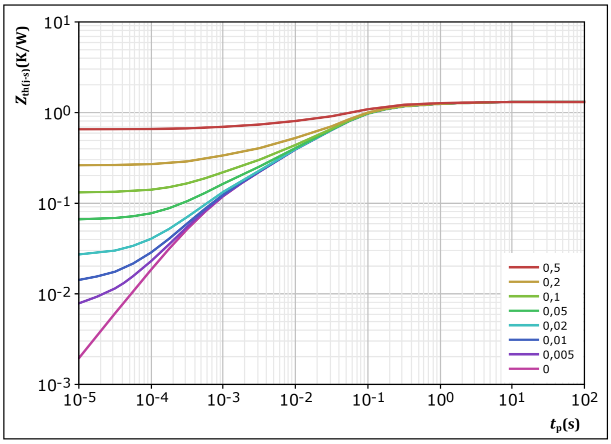
t_p = 250 µs

T_j: 25 °C, 150 °C

figure 22. FWD

Transient thermal impedance as a function of pulse width

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



D = t_p / T

$R_{th(j-s)}$ = 1,308 K/W

FWD thermal model values

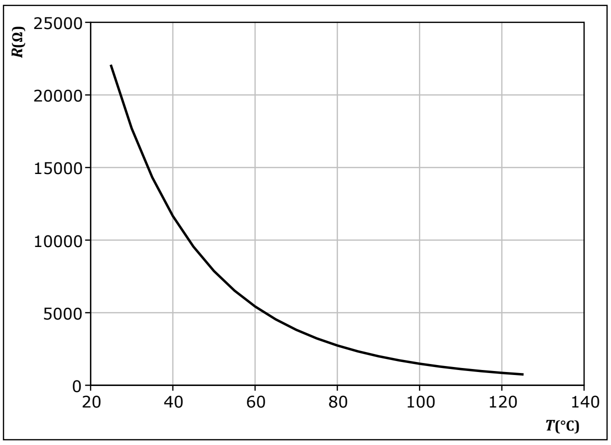
R (K/W)	τ (s)
9,18E-02	1,91E+00
2,59E-01	2,04E-01
6,72E-01	4,91E-02
1,98E-01	5,31E-03
8,79E-02	6,11E-04

Thermistor Characteristics

figure 23.	Thermistor

Typical NTC characteristic as function of temperature

R_T = f(T)

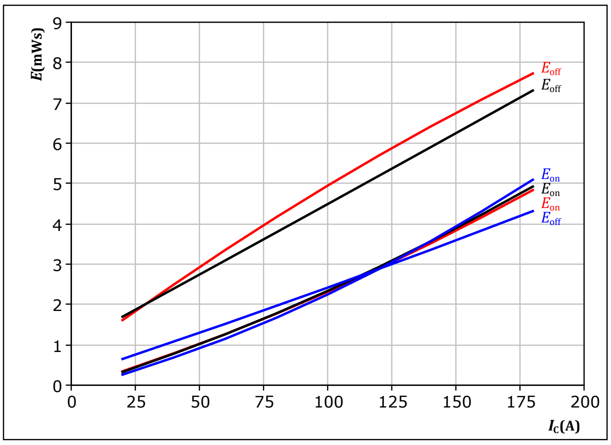


Inner Boost Switching Characteristics

figure 24. **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} = 4 Ω

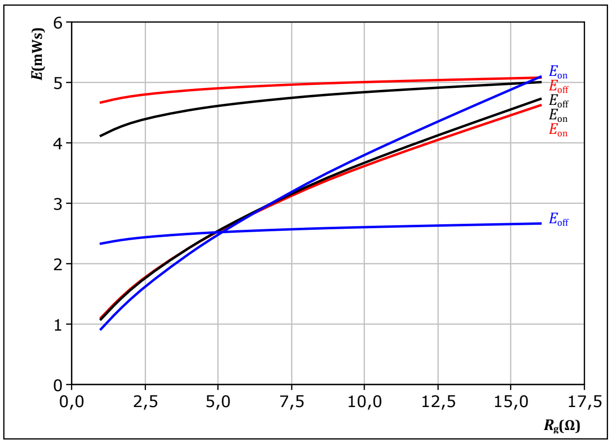
R_{goff} = 4 Ω

T_j: 25 °C, 125 °C, 150 °C

figure 25. **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

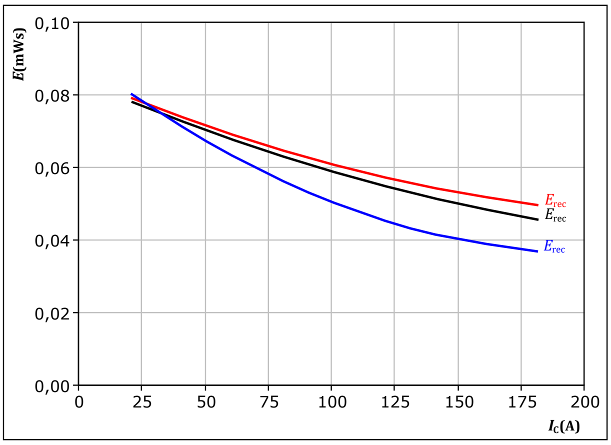
I_C = 100 A

T_j: 25 °C, 125 °C, 150 °C

figure 26. **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

V_{GE} = ±15 V

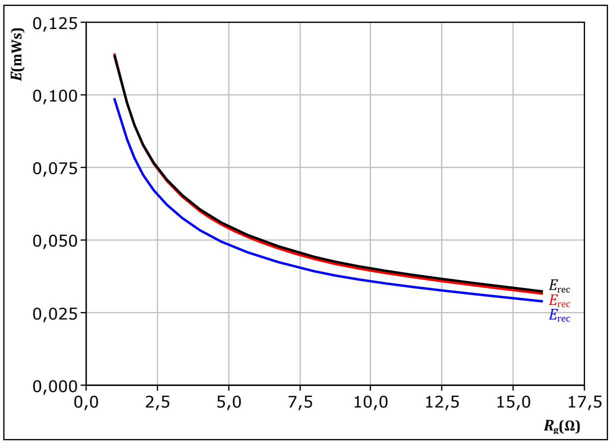
R_{gon} = 4 Ω

T_j: 25 °C, 125 °C, 150 °C

figure 27. **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

V_{GE} = ±15 V

I_C = 100 A

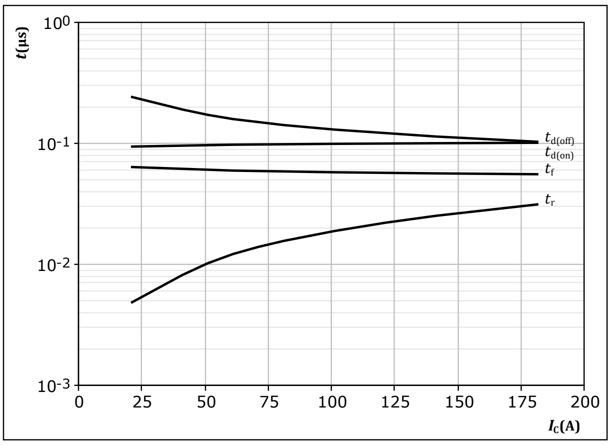
T_j: 25 °C, 125 °C, 150 °C

Inner Boost Switching Characteristics

figure 28. **IGBT**

Typical switching times as a function of collector current

t = f(I_C)



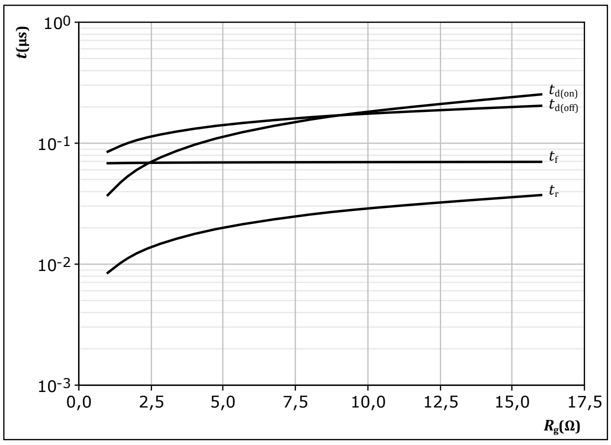
With an inductive load at

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

figure 29. **IGBT**

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

t = f(R_g)



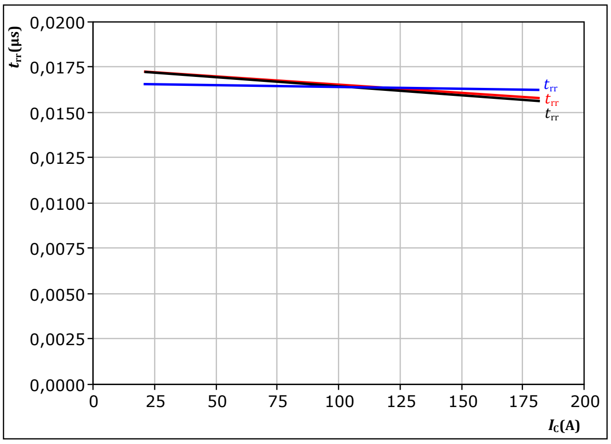
With an inductive load at

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

figure 30. **FWD**

Typical reverse recovery time as a function of collector current

t_{rr} = f(I_C)



With an inductive load at

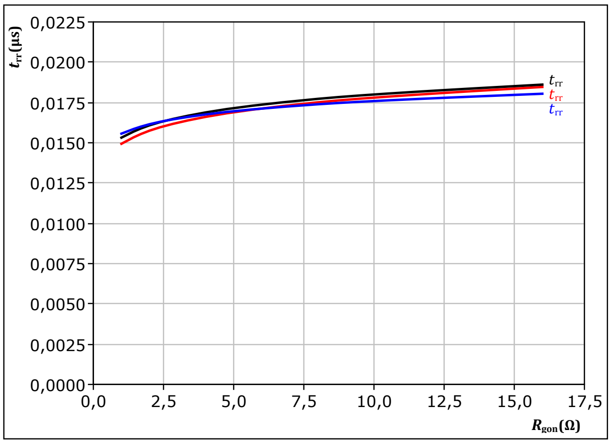
V_{CE} =	600	V
V_{GE} =	±15	V
R_{gon} =	4	Ω

T_j: 25 °C, 125 °C, 150 °C

figure 31. **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

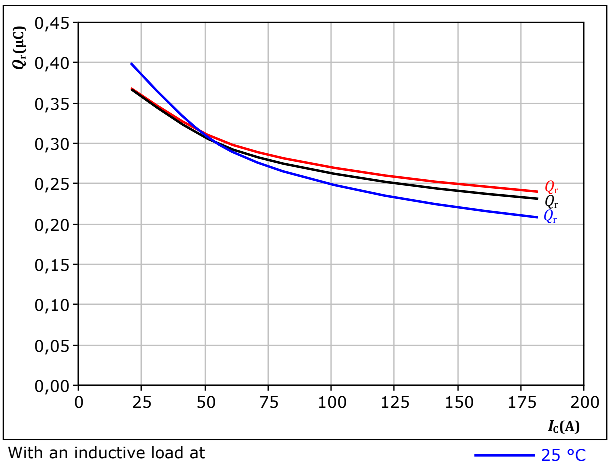
T_j: 25 °C, 125 °C, 150 °C

Inner Boost Switching Characteristics

figure 32. FWD

Typical recovered charge as a function of collector current

$Q_r = f(I_C)$



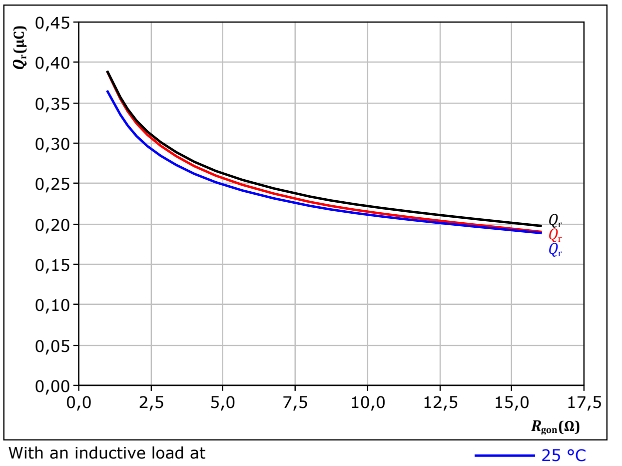
With an inductive load at

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

figure 33. FWD

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

$Q_r = f(R_{gon})$



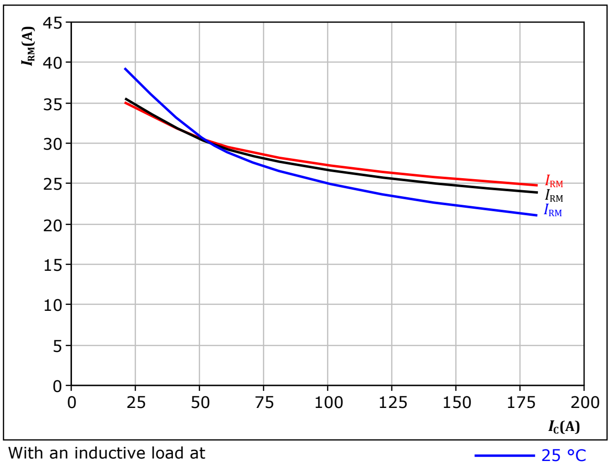
With an inductive load at

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

figure 34. FWD

Typical peak reverse recovery current as a function of collector current

$I_{RM} = f(I_C)$



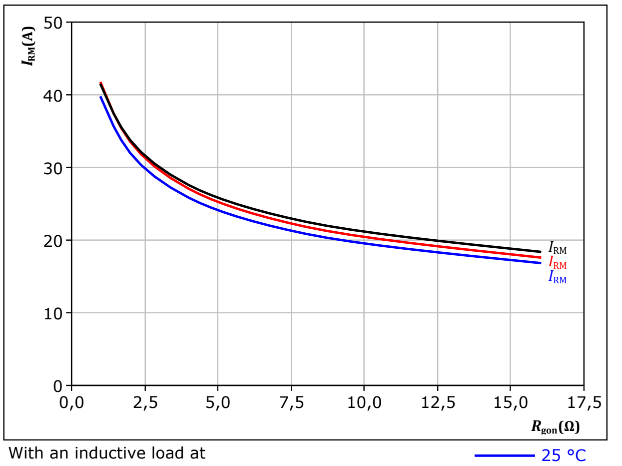
With an inductive load at

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

figure 35. 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

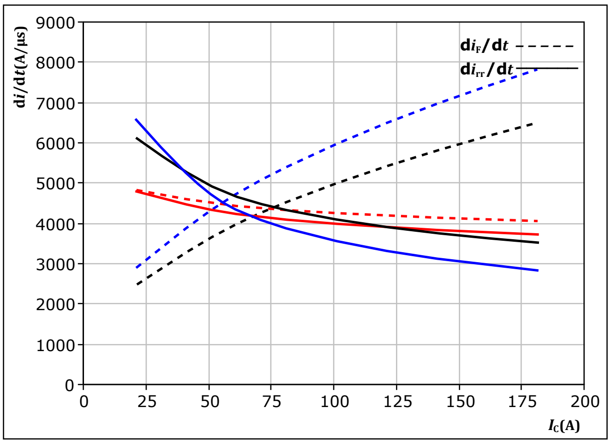
V_{CE} =	600	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
I_C =	100	A		150 °C

Inner Boost Switching Characteristics

figure 36. **FWD**

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

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



With an inductive load at

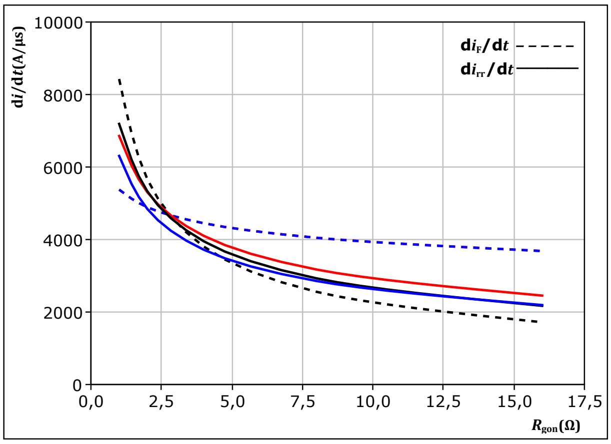
V_{CE} =	600	V	
V_{GE} =	±15	V	
R_{gon} =	4	Ω	

T_j: 25 °C, 125 °C, 150 °C

figure 37. **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

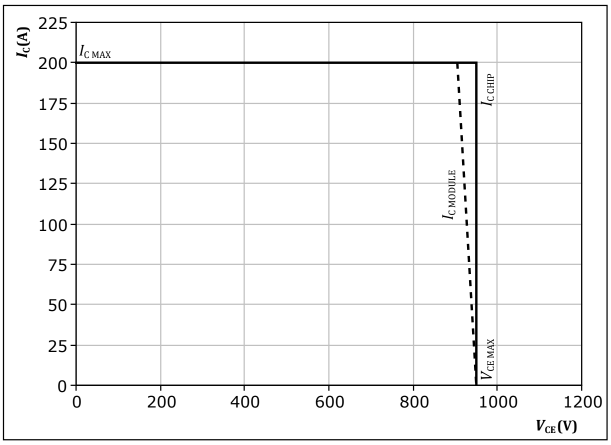
V_{CE} =	600	V	
V_{GE} =	±15	V	
I_C =	100	A	

T_j: 25 °C, 125 °C, 150 °C

figure 38. **IGBT**

Reverse bias safe operating area

I_C = f(V_{CE})



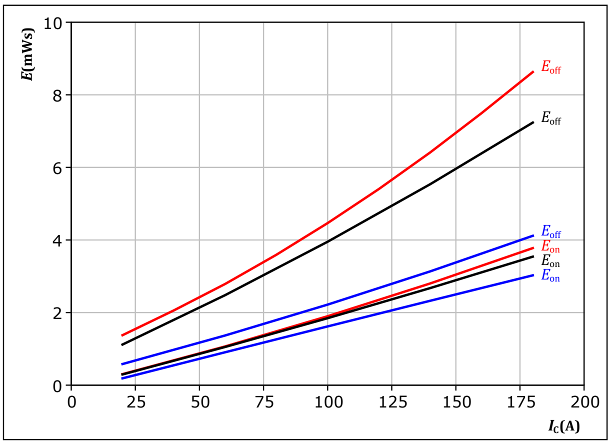
At			
	T_j =	150	°C
	R_{gon} =	4	Ω
	R_{goff} =	4	Ω

Outer Boost Switching Characteristics

figure 39. **IGBT**

Typical switching energy losses as a function of collector current

E = f(I_C)



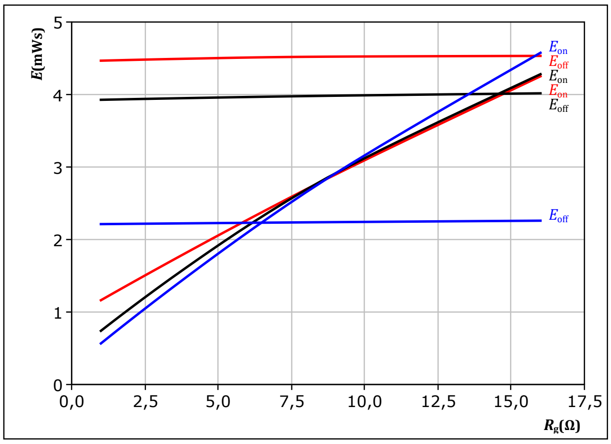
With an inductive load at

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 40. **IGBT**

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

E = f(R_g)



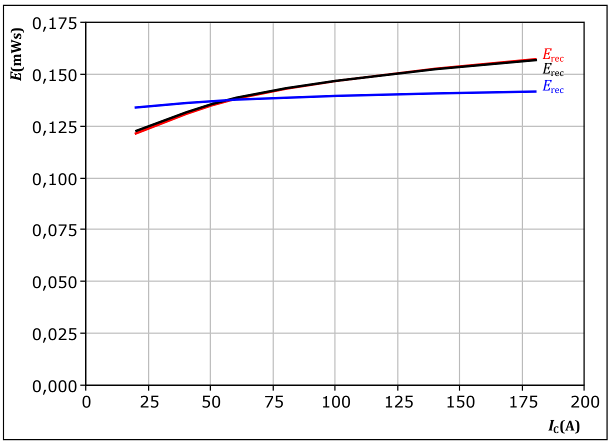
With an inductive load at

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

figure 41. **FWD**

Typical reverse recovered energy loss as a function of collector current

E_{rec} = f(I_C)



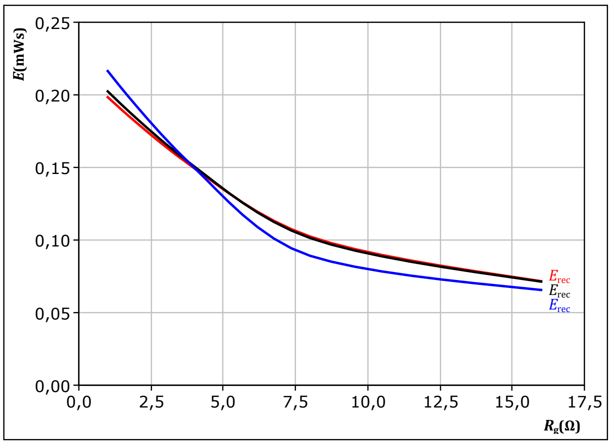
With an inductive load at

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

figure 42. **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

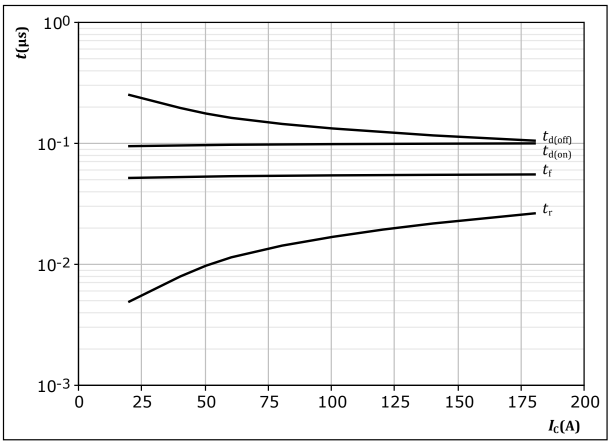
V_{CE} =	600	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
I_C =	100	A		150 °C

Outer Boost Switching Characteristics

figure 43.	**IGBT**

Typical switching times as a function of collector current

$t = \mathrm{f}(I_C)$



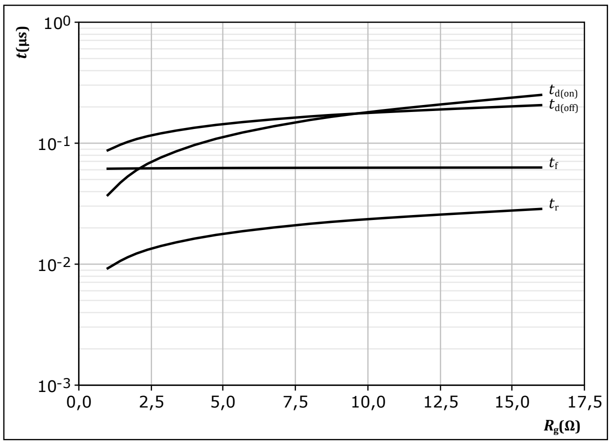
With an inductive load at

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

figure 44.	**IGBT**

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

$t = \mathrm{f}(R_g)$



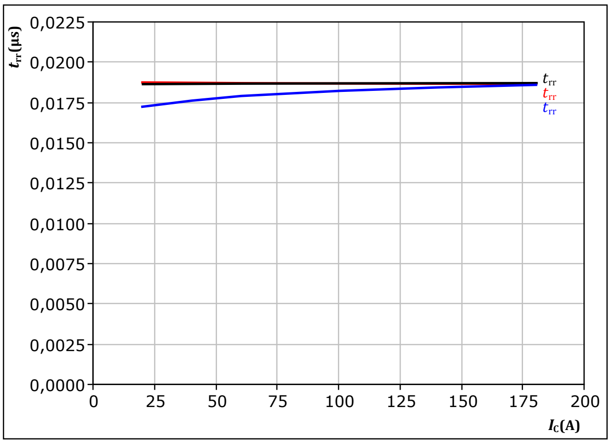
With an inductive load at

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

figure 45.	**FWD**

Typical reverse recovery time as a function of collector current

$t_{rr} = \mathrm{f}(I_C)$



With an inductive load at

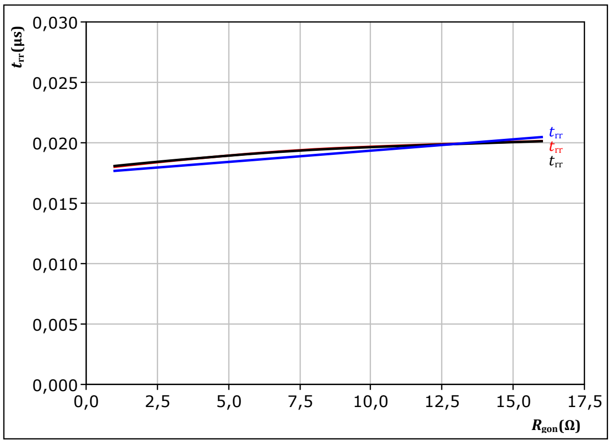
V_{CE} =	600	V
V_{GE} =	±15	V
R_{gon} =	4	Ω

T_j: 25 °C / 125 °C / 150 °C

figure 46.	**FWD**

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

$t_{rr} = \mathrm{f}(R_{gon})$



With an inductive load at

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

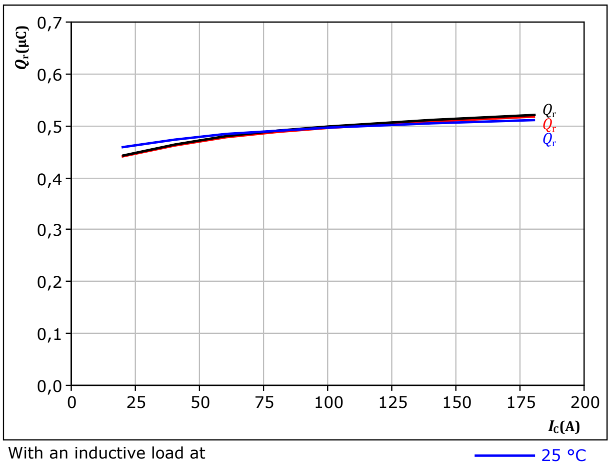
T_j: 25 °C / 125 °C / 150 °C

Outer Boost Switching Characteristics

figure 47. FWD

Typical recovered charge as a function of collector current

Q_r = f(I_C)



With an inductive load at

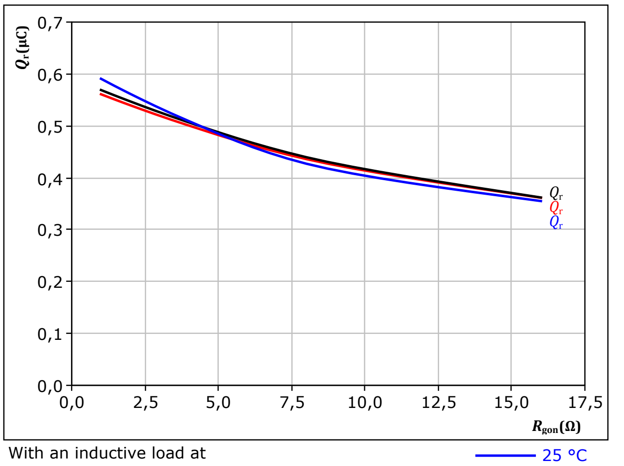
V_{CE} =	600	V	
V_{GE} =	±15	V	
R_{gon} =	4	Ω	

T_j: 25 °C, 125 °C, 150 °C

figure 48. FWD

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

Q_r = f(R_{gon})



With an inductive load at

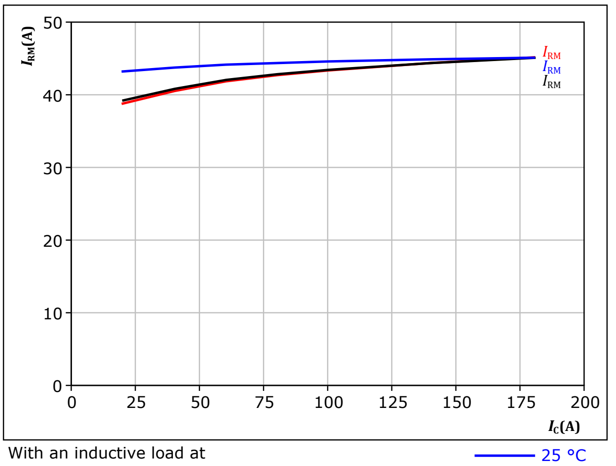
V_{CE} =	600	V
V_{GE} =	±15	V
I_C =	100	A

T_j: 25 °C, 125 °C, 150 °C

figure 49. FWD

Typical peak reverse recovery current as a function of collector current

I_{RM} = f(I_C)



With an inductive load at

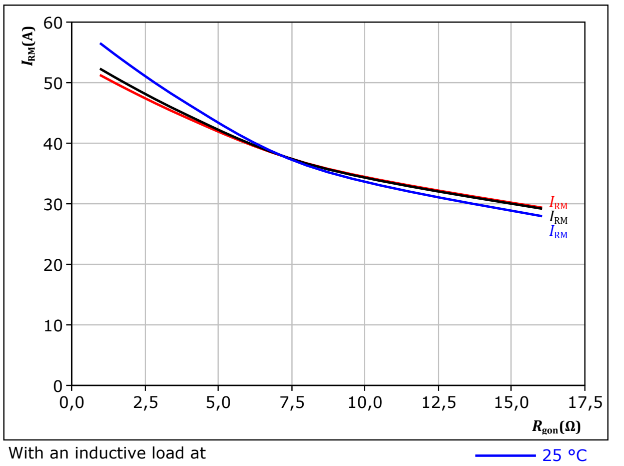
V_{CE} =	600	V
V_{GE} =	±15	V
R_{gon} =	4	Ω

T_j: 25 °C, 125 °C, 150 °C

figure 50. 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
V_{GE} =	±15	V
I_C =	100	A

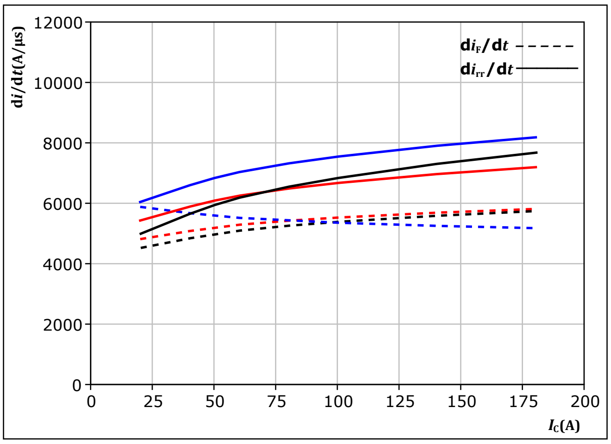
T_j: 25 °C, 125 °C, 150 °C

Outer Boost Switching Characteristics

figure 51. **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)



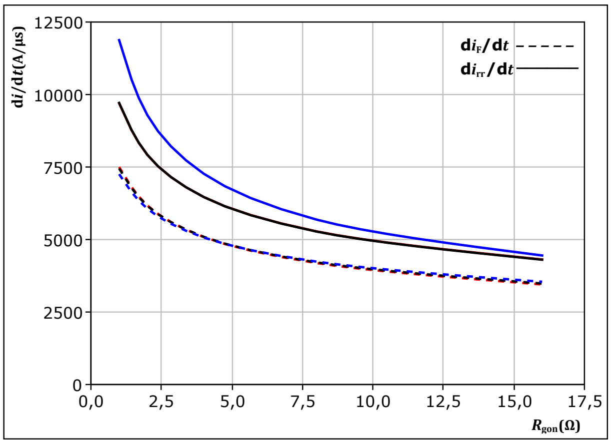
With an inductive load at

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

figure 52. **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})



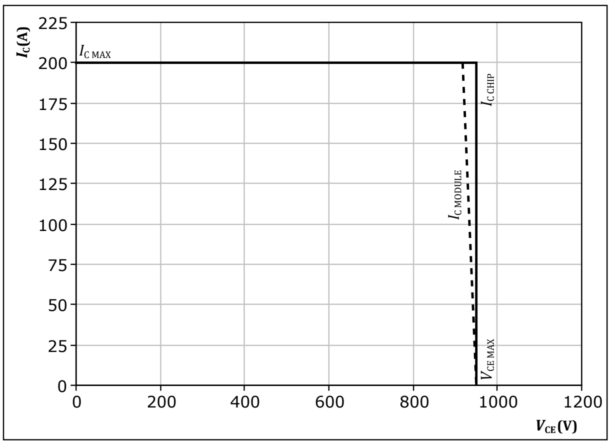
With an inductive load at

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

figure 53. **IGBT**

Reverse bias safe operating area

I_C = f(V_{CE})



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

Switching Definitions

figure 54. **IGBT**

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

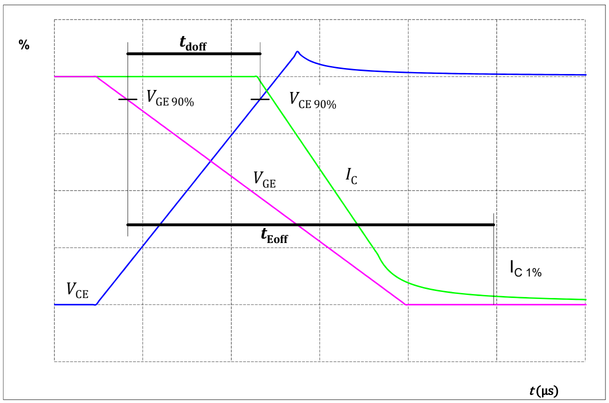


figure 55. **IGBT**

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

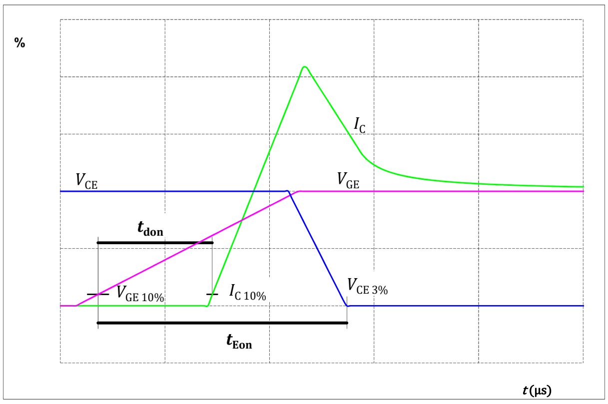


figure 56. **IGBT**

Turn-off Switching Waveforms & definition of t_f

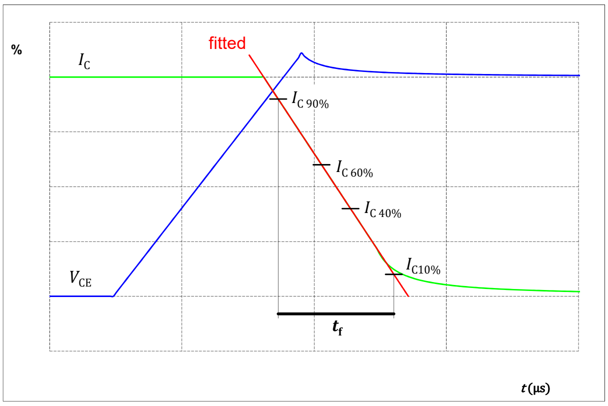
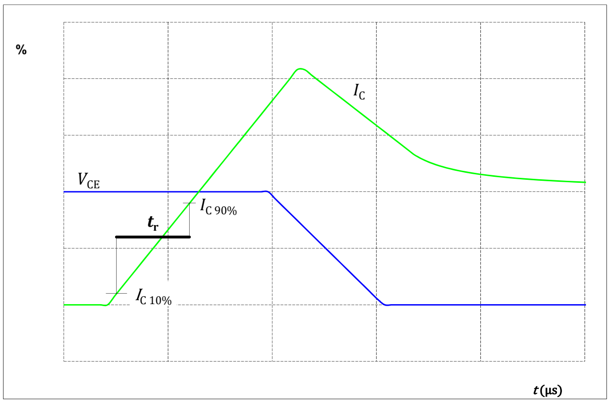


figure 57. **IGBT**

Turn-on Switching Waveforms & definition of t_r



Switching Definitions

figure 58. **FWD**

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

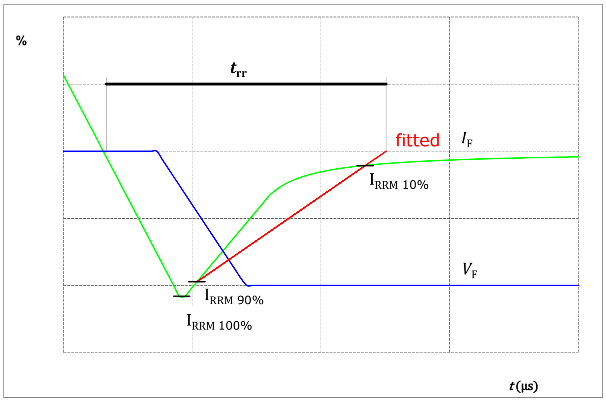
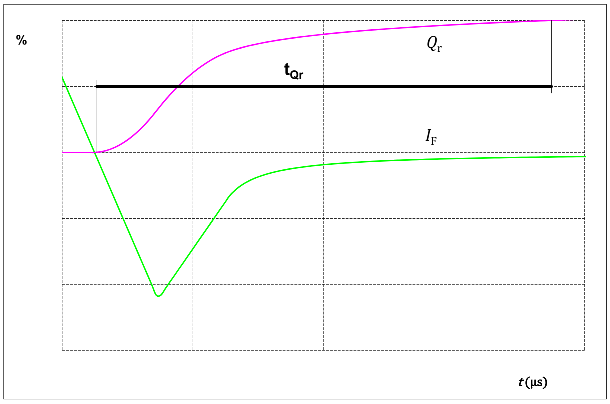


figure 59. **FWD**

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



Ordering Code

Version	Ordering Code
Without thermal paste	B0-SL103BB100S774-PB80L95Z
With thermal paste (5,2 W/mK, PTM6000HV)	B0-SL103BB100S774-PB80L95Z-/7/
With thermal paste (5,2 W/mK, PTM6000HV) and Protection Foil	B0-SL103BB100S774-PB80L95Z-/7F/

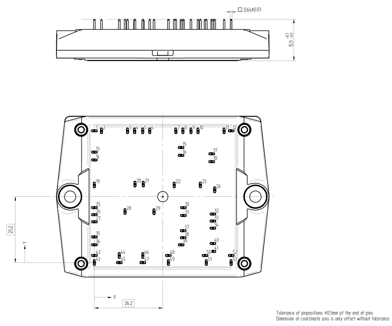
Marking

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

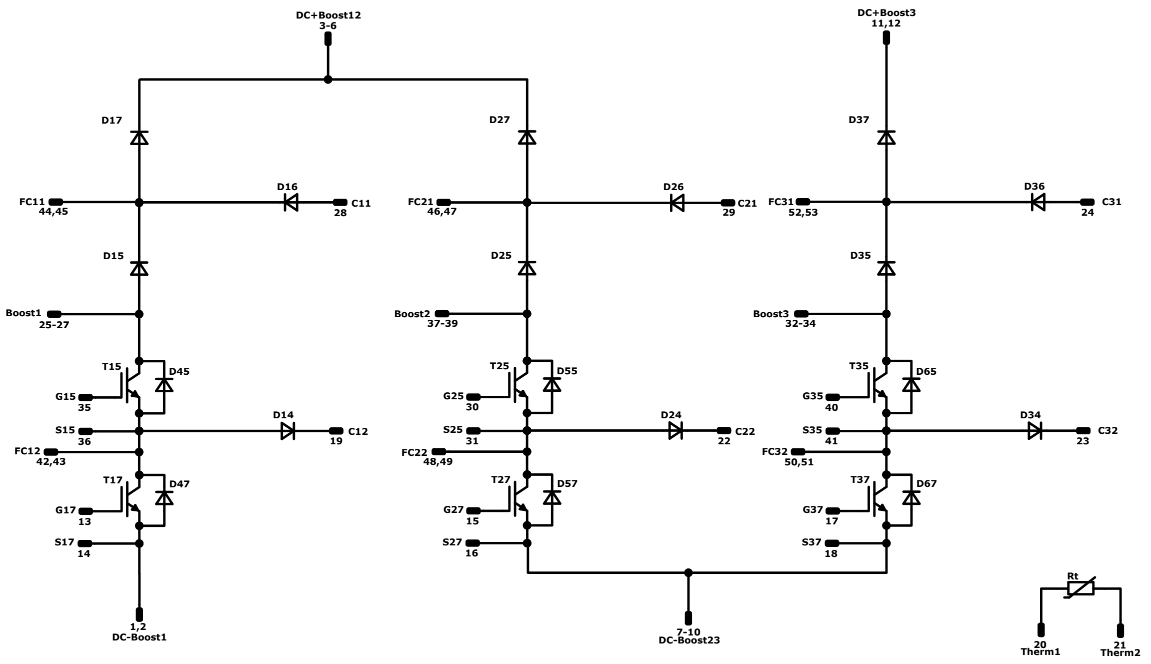
Outline

Pin table [mm]

Pin	X	Y	Function	Pin	X	Y	Function
1	0	50,4	DC-Boost1	28	11,75	19,5	C11
2	2,7	50,4	DC-Boost1	29	22,85	19,45	C21
3	12,7	50,4	DC+Boost12	30	34,1	21	G25
4	15,4	50,4	DC+Boost12	31	34,1	18	S25
5	18,5	50,4	DC+Boost12	32	45,4	18,55	Boost3
6	21,2	50,4	DC+Boost12	33	45,4	15,85	Boost3
7	31,2	50,4	DC-Boost23	34	45,4	13,15	Boost3
8	33,9	50,4	DC-Boost23	35	0	9,8	G15
9	37	50,4	DC-Boost23	36	0	6,8	S15
10	39,7	50,4	DC-Boost23	37	34	12,2	Boost2
11	49,7	50,4	DC+Boost3	38	34	9,5	Boost2
12	52,4	50,4	DC+Boost3	39	33,25	6,8	Boost2
13	0	42,25	G17	40	45,4	7,3	G35
14	0	39,25	S17	41	45,4	4,3	S35
15	33,2	44	G27	42	0	2,7	FC12
16	33,2	41	S27	43	0	0	FC12
17	44,95	41,6	G37	44	9,55	2,7	FC11
18	44,95	38,6	S37	45	9,55	0	FC11
19	0	29,7	C12	46	18,55	2,7	FC21
20	15,55	30	Therm1	47	18,55	0	FC21
21	18,75	30	Therm2	48	28,35	2,7	FC22
22	30,6	29,7	C22	49	28,35	0	FC22
23	40,6	29,7	C32	50	42,4	2,7	FC32
24	46,1	27,85	C31	51	42,9	0	FC32
25	0	21	Boost1	52	52,4	2,7	FC31
26	0	18,3	Boost1	53	52,4	0	FC31
27	0	15,6	Boost1				



Pinout



Identification

ID	Component	Voltage	Current	Function	Comment
T15, T25, T35	IGBT	950 V	100 A	Inner Boost Switch	
D15, D25, D35	FWD	1200 V	60 A	Inner Boost Diode	
D45, D55 , D65	FWD	1200 V	50 A	Inner Boost Sw. Protection Diode	
T17, T27, T37	IGBT	950 V	100 A	Outer Boost Switch	
D17, D27, D37	FWD	1200 V	60 A	Outer Boost Diode	
D47, D57, D67	FWD	1200 V	50 A	Outer Boost Sw. Protection Diode	
D16, D26, D36	FWD	1200 V	35 A	Aux Diode H	
D14, D24, D34	FWD	1200 V	35 A	Aux Diode L	
Rt	Thermistor			Thermistor	

Packaging instruction				
Standard packaging quantity (SPQ) 45	>SPQ	Standard	<SPQ	Sample

Handling instruction
Handling instructions for *flow* S3 packages see vincotech.com website.

Package data
Package data for *flow* S3 packages see vincotech.com website.

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

Application Note
For use of pre-charging auxiliary diodes see application note: "The Advantages and Opearation of Flying-Capacitor Boosters" at vincotech.com

UL recognition and file number
This device is UL 1557 recognized under E192116 up to a junction temperature under switching condition $T_{j,op}$=150°C and up to 4000VAC/1min isolation voltage. For more information see vincotech.com website.

Document No.:	**Date:**	**Modification:**	**Pages**
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