



flowBOOST S3 triple

950 V / 100 A

Features

- Triple Booster
- High Performance Flying Capacitor Topology
- Optimized for 1500 V applications
- Latest IGBT & SiC Technology
- Integrated flying snubber capacitor
- Integrated auxiliary diodes for flying capacitor precharge.
- Integrated NTC
- Low Inductance Design

Target applications

- Solar Inverters

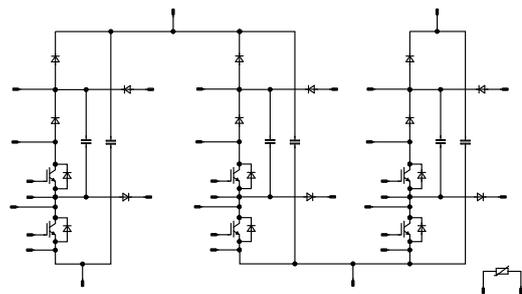
Types

- B0-SL103BA100S714-LS60L98Z

flow S3 12 mm housing



Schematic





Vincotech

B0-SL103BA100S714-LS60L98Z
datasheet

Maximum Ratings

$T_j = 25\text{ °C}$, unless otherwise specified

Parameter	Symbol	Conditions	Value	Unit
Inner Boost Switch				
Collector-emitter voltage	V_{CES}		950	V
Collector current (DC current)	I_C	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	77	A
Repetitive peak collector current	I_{CRM}	t_p limited by T_{jmax}	200	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	145	W
Gate-emitter voltage	V_{GES}		± 20	V
Maximum junction temperature	T_{jmax}		175	°C
Outer Boost Switch				
Collector-emitter voltage	V_{CES}		950	V
Collector current (DC current)	I_C	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	77	A
Repetitive peak collector current	I_{CRM}	t_p limited by T_{jmax}	200	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	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	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	52	A
Repetitive peak forward current	I_{FRM}	t_p limited by T_{jmax}	188	A
Surge (non-repetitive) forward current	I_{FSM}	Single Half Sine Wave, $t_p = 10\text{ ms}$	284	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	141	W
Maximum junction temperature	T_{jmax}		175	°C



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Maximum Ratings

$T_j = 25\text{ °C}$, unless otherwise specified

Parameter	Symbol	Conditions	Value	Unit
Outer Boost Diode				
Peak repetitive reverse voltage	V_{RRM}		1200	V
Forward current (DC current)	I_F	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	52	A
Repetitive peak forward current	I_{FRM}	t_p limited by T_{jmax}	188	A
Surge (non-repetitive) forward current	I_{FSM}	Single Half Sine Wave, $t_p = 10\text{ ms}$	284	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	141	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	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	40	A
Repetitive peak forward current	I_{FRM}	t_p limited by T_{jmax}	70	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	76	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	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	40	A
Repetitive peak forward current	I_{FRM}	t_p limited by T_{jmax}	70	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	76	W
Maximum junction temperature	T_{jmax}		175	°C



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Maximum Ratings

$T_j = 25\text{ °C}$, unless otherwise specified

Parameter	Symbol	Conditions	Value	Unit
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Aux Diode H

Peak repetitive reverse voltage	V_{RRM}		1200	V
Forward current (DC current)	I_F	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	32	A
Surge (non-repetitive) forward current	I_{FSM}	Single Half Sine Wave, $t_p = 10\text{ ms}$ $T_j = 150\text{ °C}$	170	A
Surge current capability	I^2t		145	A ² s
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	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	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	32	A
Surge (non-repetitive) forward current	I_{FSM}	Single Half Sine Wave, $t_p = 10\text{ ms}$ $T_j = 150\text{ °C}$	170	A
Surge current capability	I^2t		145	A ² s
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	73	W
Maximum junction temperature	T_{jmax}		175	°C

Flying Capacitor

Maximum DC voltage	V_{MAX}		1000	V
Operation Temperature	T_{op}		-55 ... 125	°C

Capacitor (DC)

Maximum DC voltage	V_{MAX}		1500	V
Operation Temperature	T_{op}		-55 ... 125	°C



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datasheet

Maximum Ratings

$T_j = 25\text{ °C}$, unless otherwise specified

Parameter	Symbol	Conditions	Value	Unit
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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* $t_p = 2\text{ s}$	6000	V
Creepage distance			9,72	mm
Clearance			8,25	mm
Comparative Tracking Index	CTI		≥ 600	

*100 % tested in production



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datasheet

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 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	$V_{CE(sat)}$		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	Gate charge	15		0	25		230		nC

Thermal

Thermal resistance junction to sink ⁽²⁾	$R_{th(j-s)}$	$\lambda_{paste} = 4,4$ W/mK (PTM)						0,66		K/W
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Dynamic

Turn-on delay time	$t_{d(on)}$					25 125		147,2 147,52		ns
Rise time	t_r	$R_{gon} = 8$ Ω $R_{goff} = 8$ Ω				25 125		14,08 16,32		ns
Turn-off delay time	$t_{d(off)}$		±15	600	65	25 125		139,84 172,8		ns
Fall time	t_f					25 125		25,43 64,44		ns
Turn-on energy (per pulse)	E_{on}	$Q_{iFWD} = 0,171$ μC $Q_{tFWD} = 0,171$ μC				25 125		1,71 1,78		mWs
Turn-off energy (per pulse)	E_{off}					25 125		1,65 2,78		mWs



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Characteristic Values

Parameter	Symbol	Conditions					Values			Unit
		V_{GS} [V]	V_{GE} [V]	V_{DS} [V]	V_F [V]	I_C [A] I_D [A] I_F [A]	T_j [°C]	Min	Typ	

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	$V_{CE(sat)}$		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	Gate charge	15			0	25		230		nC

Thermal

Thermal resistance junction to sink ⁽²⁾	$R_{th(j-s)}$	$\lambda_{paste} = 4,4$ W/mK (PTM)							0,66		K/W
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Dynamic

Turn-on delay time	$t_{d(on)}$						25 125		147,84 148,8		ns
Rise time	t_r	$R_{gon} = 8$ Ω $R_{goff} = 8$ Ω					25 125		12,8 14,08		ns
Turn-off delay time	$t_{d(off)}$		±15	600	65		25 125		144,64 177,92		ns
Fall time	t_f						25 125		31,79 55,25		ns
Turn-on energy (per pulse)	E_{on}	$Q_{tFWD} = 0,162$ μC $Q_{tFWD} = 0,158$ μC					25 125		1,4 1,47		mWs
Turn-off energy (per pulse)	E_{off}						25 125		1,74 2,83		mWs



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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			40	25 125 150		1,51 2,03 2,13	1,8 ⁽¹⁾		V
Reverse leakage current	I_R	$V_T = 1200$ V			25		120	1000		μA
Thermal										
Thermal resistance junction to sink ⁽²⁾	$R_{th(j-s)}$	$\lambda_{paste} = 4,4$ W/mK (PTM)					0,67			K/W
Dynamic										
Peak recovery current	I_{RRM}	$di/dt=4622$ A/μs $di/dt=4037$ A/μs	±15	600	65	25		23,55		A
						125		23,6		
Reverse recovery time	t_{rr}					25		14,26		ns
						125		14,7		
Recovered charge	Q_r					25		0,171		μC
						125		0,171		
Reverse recovered energy	E_{rec}	25		0,029		mWs				
		125		0,031						
Peak rate of fall of recovery current	$(di_{rr}/dt)_{max}$	25		4241		A/μs				
		125		3833						



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Characteristic Values

Parameter	Symbol	Conditions					Values			Unit
		V_{GS} [V]	V_{GE} [V]	V_{DS} [V]	V_F [V]	T_j [°C]	Min	Typ	Max	
Outer Boost Diode										
Static										
Forward voltage	V_F				40	25 125 150		1,51 2,03 2,13	1,8 ⁽¹⁾	V
Reverse leakage current	I_R	$V_T = 1200$ V				25		120	1000	μA
Thermal										
Thermal resistance junction to sink ⁽²⁾	$R_{th(j-s)}$	$\lambda_{paste} = 4,4$ W/mK (PTM)						0,67		K/W
Dynamic										
Peak recovery current	I_{RRM}	$di/dt=5513$ A/μs $di/dt=4820$ A/μs	±15	600	65	25		28,7		A
						125		28,5		
Reverse recovery time	t_{rr}					25		13,14		
						125		13,78		
Recovered charge	Q_r					25		0,162		
		125		0,158		μC				
Reverse recovered energy	E_{rec}	25		0,032						
		125		0,032		mWs				
Peak rate of fall of recovery current	$(di_{rr}/dt)_{max}$	25		6350						
		125		5602		A/μs				



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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				35	25 125 150		1,66 1,76 1,75	2,1 ⁽¹⁾	V
Reverse leakage current	I_R	$V_r = 1200$ V				25			40	μA

Thermal

Thermal resistance junction to sink ⁽²⁾	$R_{th(j-s)}$	$\lambda_{paste} = 4,4$ W/mK (PTM)						1,26		K/W
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Outer Boost Sw. Protection Diode

Static

Forward voltage	V_F				35	25 125 150		1,66 1,76 1,75	2,1 ⁽¹⁾	V
Reverse leakage current	I_R	$V_r = 1200$ V				25			40	μA

Thermal

Thermal resistance junction to sink ⁽²⁾	$R_{th(j-s)}$	$\lambda_{paste} = 4,4$ W/mK (PTM)						1,26		K/W
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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			60 5500	μA

Thermal

Thermal resistance junction to sink ⁽²⁾	$R_{th(j-s)}$	$\lambda_{paste} = 4,4$ W/mK (PTM)						1,31		K/W
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datasheet

Characteristic Values

Parameter	Symbol	Conditions					Values			Unit
		V_{GS} [V]	V_{GE} [V]	V_{DS} [V]	I_D [A]	T_j [°C]	Min	Typ	Max	

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	$V_i = 1200$ V				25 150		2700	60 5500	μA

Thermal

Thermal resistance junction to sink ⁽²⁾	$R_{th(j-s)}$	$\lambda_{paste} = 4,4$ W/mK (PTM)						1,31		K/W
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Flying Capacitor

Static

Capacitance	C	DC bias voltage = 0 V				25		100		nF
Tolerance							-10		10	%
Dissipation factor		$f = 1$ kHz				25		2,5		%

Capacitor (DC)

Static

Capacitance	C	DC bias voltage = 0 V				25		39		nF
Tolerance							-20		20	%



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Characteristic Values

Parameter	Symbol	Conditions					Values			Unit
		V_{GS} [V]	V_{GE} [V]	V_{DS} [V]	V_{CE} [V]	T_j [°C]	Min	Typ	Max	

Thermistor

Static

Rated resistance	R					25		22		kΩ
Deviation of R_{100}	$A_{R/R}$	$R_{100} = 1484 \Omega$				100	-5		5	%
Power dissipation	P							5		mW
Power dissipation constant	d					25		1,5		mW/K
B-value	$B_{(25/50)}$	Tol. $\pm 1 \%$						3962		K
B-value	$B_{(25/100)}$	Tol. $\pm 1 \%$						4000		K
Vincotech Thermistor Reference									I	

⁽¹⁾ Value at chip level

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

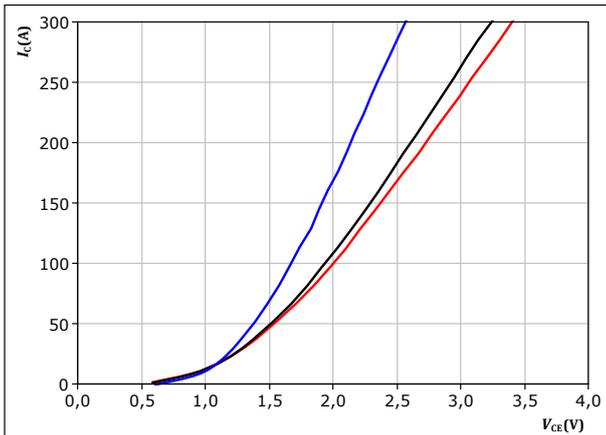


Inner Boost Switch Characteristics

figure 1. IGBT

Typical output characteristics

$$I_C = f(V_{CE})$$



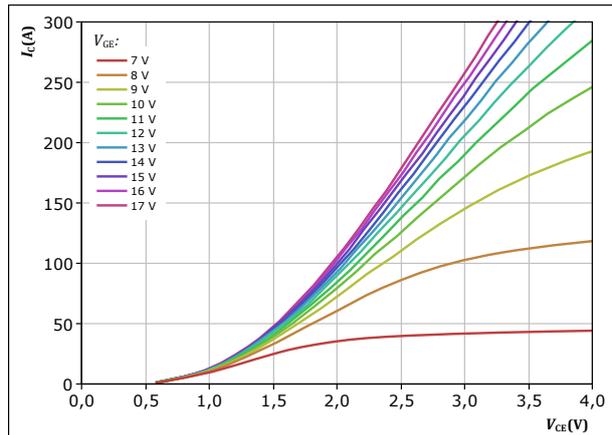
$t_p = 250 \mu s$
 $V_{GE} = 15 V$

T_j :
— 25 °C
— 125 °C
— 150 °C

figure 2. IGBT

Typical output characteristics

$$I_C = f(V_{CE})$$

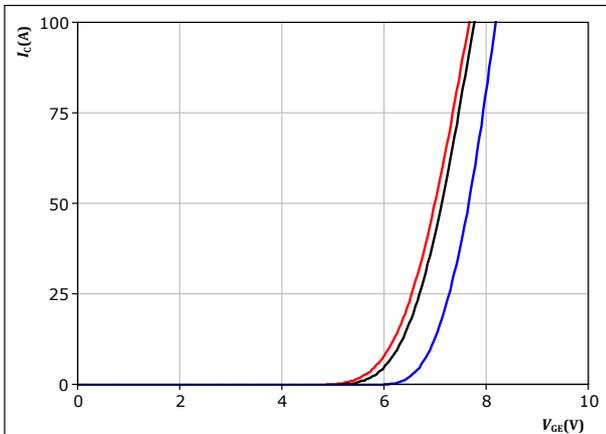


$t_p = 250 \mu s$
 $T_j = 150 \text{ }^\circ C$
 V_{GE} from 7 V to 17 V in steps of 1 V

figure 3. IGBT

Typical transfer characteristics

$$I_C = f(V_{GE})$$



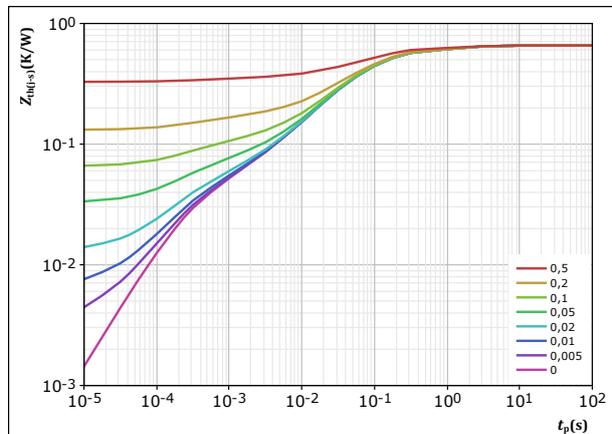
$t_p = 250 \mu s$
 $V_{CE} = 10 V$

T_j :
— 25 °C
— 125 °C
— 150 °C

figure 4. IGBT

Transient thermal impedance as a function of pulse width

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



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

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

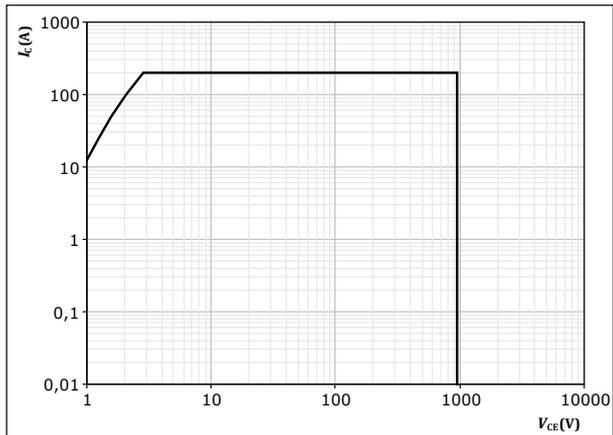


Inner Boost Switch Characteristics

figure 5. IGBT

Safe operating area

$$I_C = f(V_{CE})$$



$D =$ single pulse

$T_s = 80$ °C

$V_{CE} = 15$ V

$T_j = T_{jmax}$

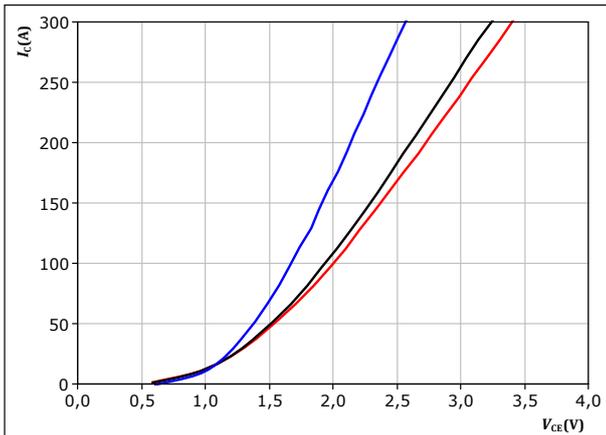


Outer Boost Switch Characteristics

figure 6. IGBT

Typical output characteristics

$$I_C = f(V_{CE})$$



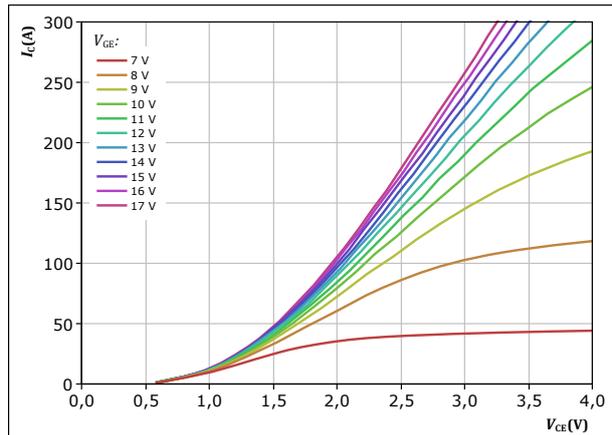
$t_p = 250 \mu s$
 $V_{GE} = 15 V$

T_j :
— 25 °C
— 125 °C
— 150 °C

figure 7. IGBT

Typical output characteristics

$$I_C = f(V_{CE})$$

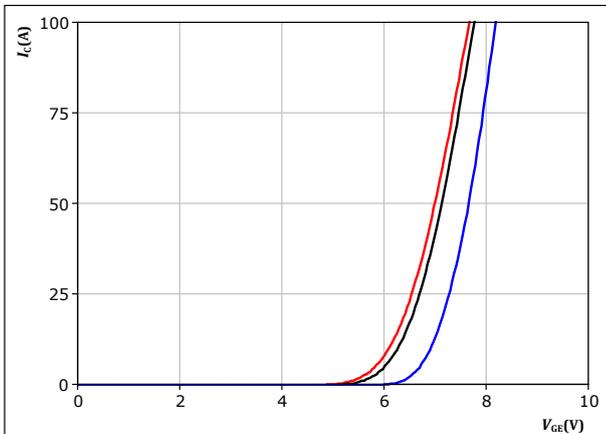


$t_p = 250 \mu s$
 $T_j = 150 \text{ }^\circ C$
 V_{GE} from 7 V to 17 V in steps of 1 V

figure 8. IGBT

Typical transfer characteristics

$$I_C = f(V_{GE})$$



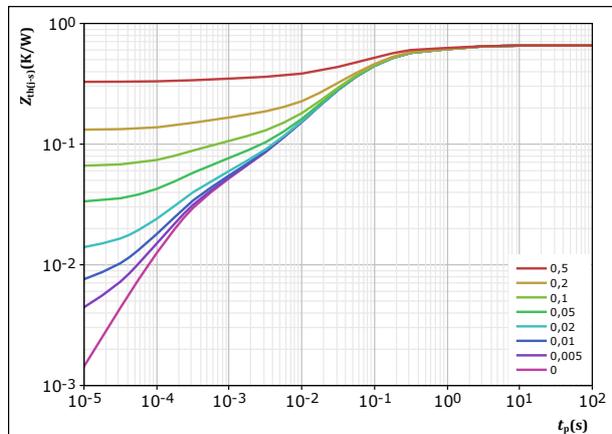
$t_p = 250 \mu s$
 $V_{CE} = 10 V$

T_j :
— 25 °C
— 125 °C
— 150 °C

figure 9. IGBT

Transient thermal impedance as a function of pulse width

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



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

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

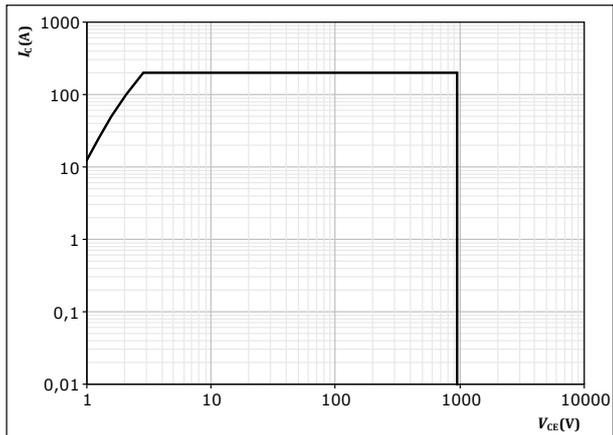


Outer Boost Switch Characteristics

figure 10. IGBT

Safe operating area

$$I_C = f(V_{CE})$$



$D =$ single pulse

$T_s = 80$ °C

$V_{CE} = 15$ V

$T_j = T_{jmax}$



Inner Boost Diode Characteristics

figure 11. FWD

Typical forward characteristics

$$I_F = f(V_F)$$

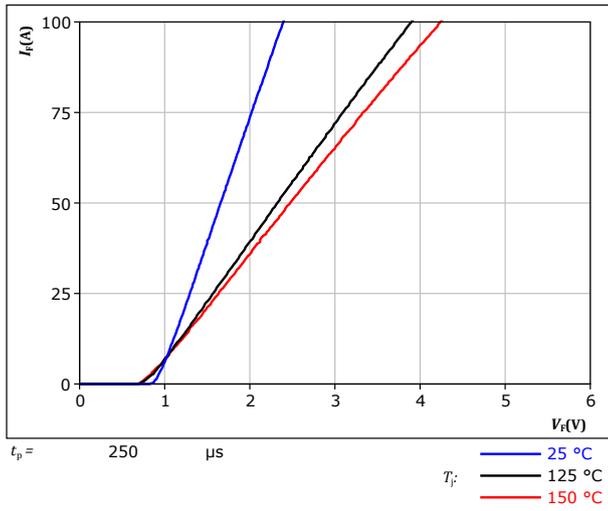
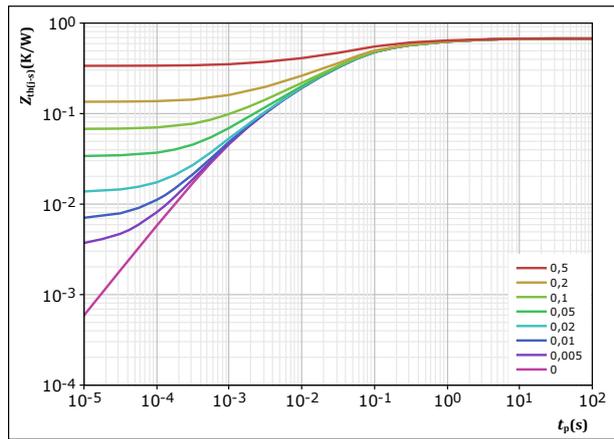


figure 12. FWD

Transient thermal impedance as a function of pulse width

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



$D =$	t_p / T	
$R_{th(j-s)} =$	0,674	K/W
FWD thermal model values		
R (K/W)	τ (s)	
6,19E-02	2,66E+00	
1,12E-01	3,55E-01	
3,32E-01	5,39E-02	
1,25E-01	7,89E-03	
4,31E-02	1,17E-03	



Outer Boost Diode Characteristics

figure 13. FWD

Typical forward characteristics

$$I_F = f(V_F)$$

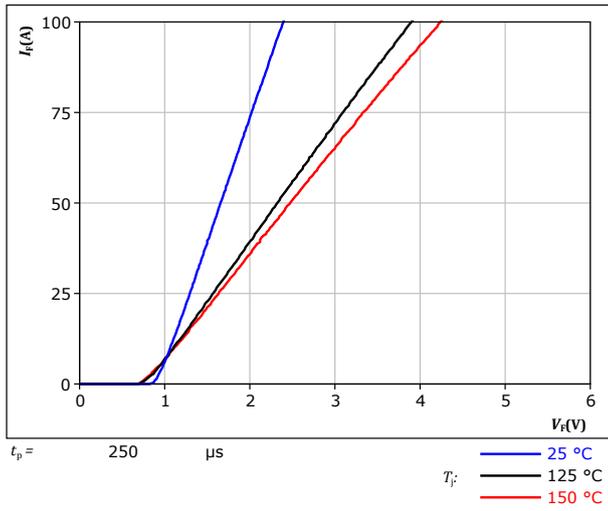
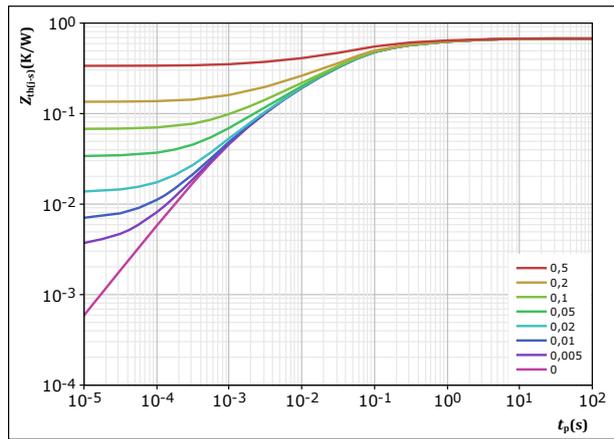


figure 14. FWD

Transient thermal impedance as a function of pulse width

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



$D =$	t_p / T	
$R_{th(j-s)} =$	0,674	K/W
FWD thermal model values		
R (K/W)	τ (s)	
6,19E-02	2,66E+00	
1,12E-01	3,55E-01	
3,32E-01	5,39E-02	
1,25E-01	7,89E-03	
4,31E-02	1,17E-03	



Inner Boost Sw. Protection Diode Characteristics

figure 15. FWD

Typical forward characteristics

$$I_F = f(V_F)$$

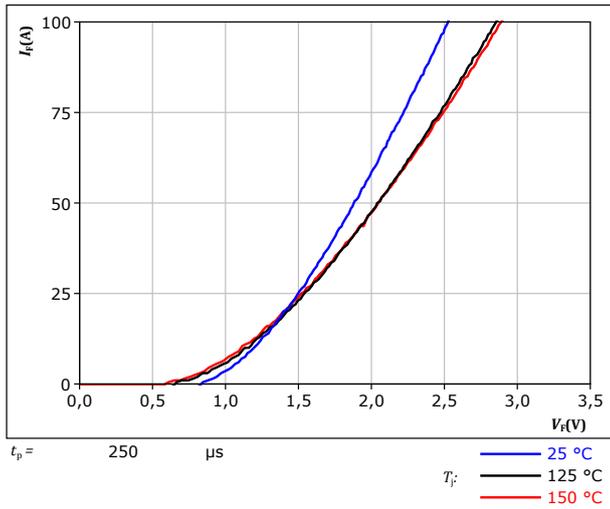
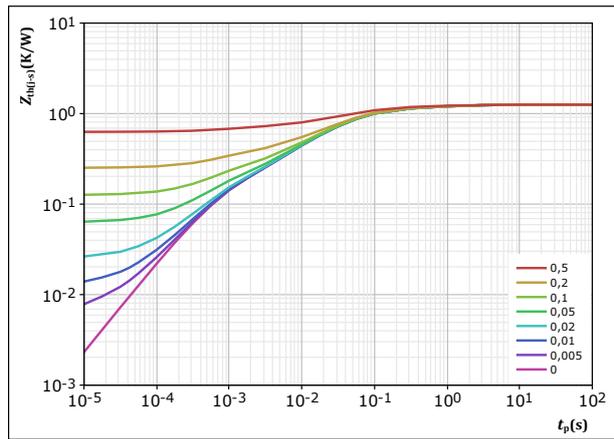


figure 16. FWD

Transient thermal impedance as a function of pulse width

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



$D =$	t_p / T	
$R_{th(j-s)} =$	1,256	K/W
FWD thermal model values		
R (K/W)	τ (s)	
8,30E-02	2,06E+00	
1,53E-01	2,53E-01	
5,96E-01	4,75E-02	
2,95E-01	9,13E-03	
1,30E-01	6,93E-04	



Outer Boost Sw. Protection Diode Characteristics

figure 17. FWD

Typical forward characteristics

$$I_F = f(V_F)$$

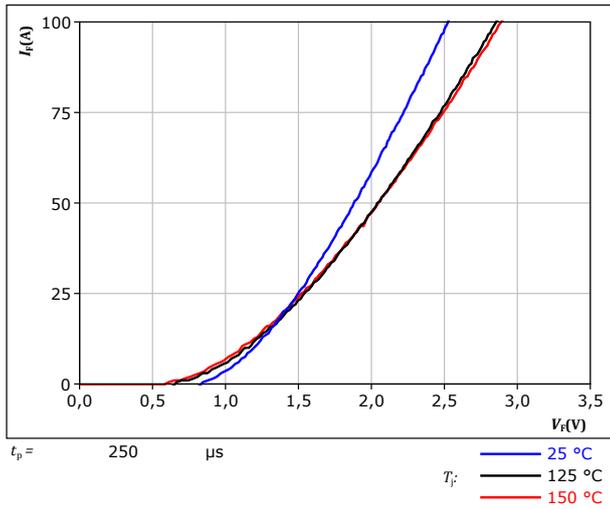
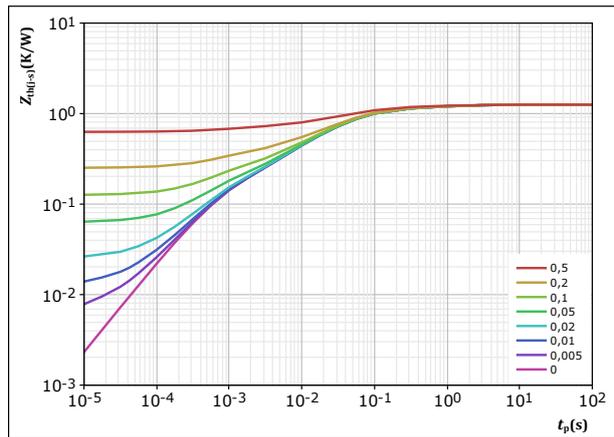


figure 18. FWD

Transient thermal impedance as a function of pulse width

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



$D =$	t_p / T	
$R_{th(j-s)} =$	1,256	K/W
FWD thermal model values		
R (K/W)	τ (s)	
8,30E-02	2,06E+00	
1,53E-01	2,53E-01	
5,96E-01	4,75E-02	
2,95E-01	9,13E-03	
1,30E-01	6,93E-04	



Aux Diode H Characteristics

figure 19. FWD

Typical forward characteristics

$$I_F = f(V_F)$$

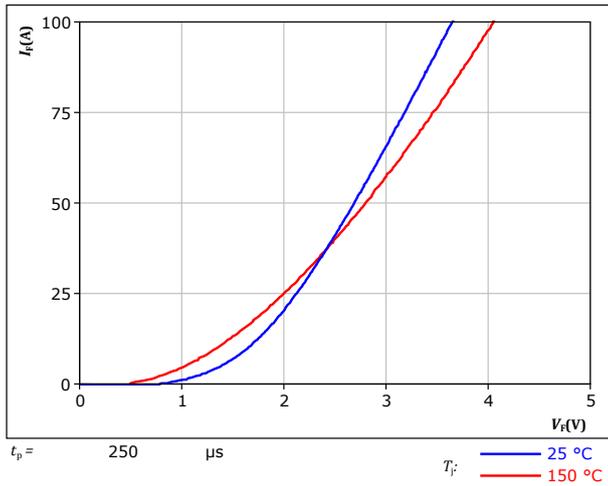
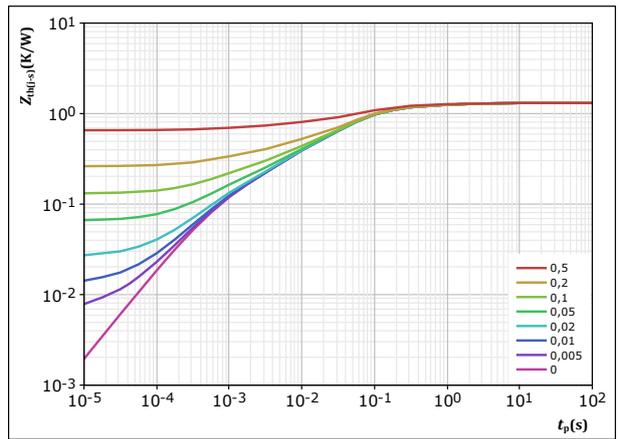


figure 20. FWD

Transient thermal impedance as a function of pulse width

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



$D = t_p / T$

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

FWD thermal model values

$R \text{ (K/W)}$	$\tau \text{ (s)}$
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

$$I_F = f(V_F)$$

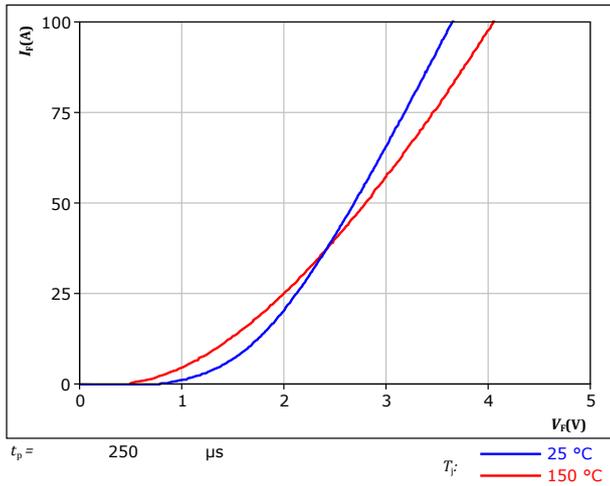
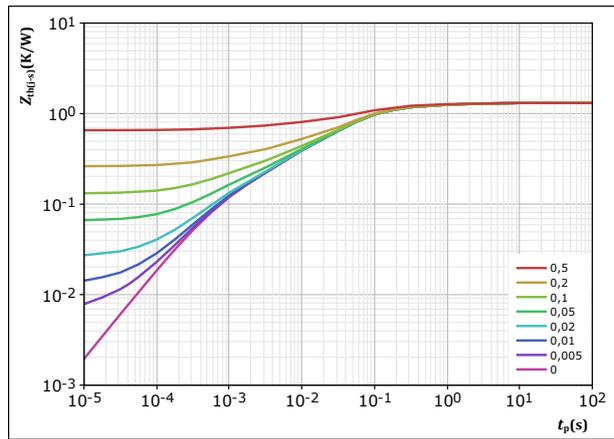


figure 22. FWD

Transient thermal impedance as a function of pulse width

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



$D = t_p / T$

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

FWD thermal model values

$R \text{ (K/W)}$	$\tau \text{ (s)}$
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

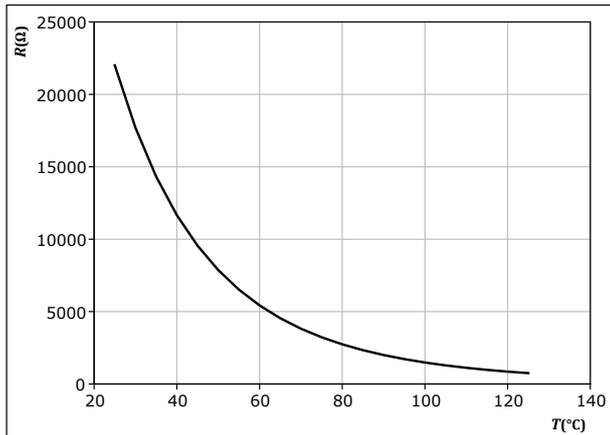


Thermistor Characteristics

figure 23. Thermistor

Typical NTC characteristic as function of temperature

$$R_T = f(T)$$



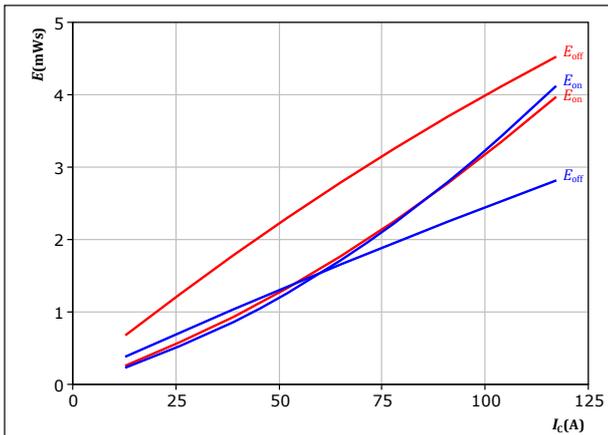


Inner Boost Switching Characteristics

figure 24. IGBT

Typical switching energy losses as a function of collector current

$$E = f(I_c)$$



With an inductive load at

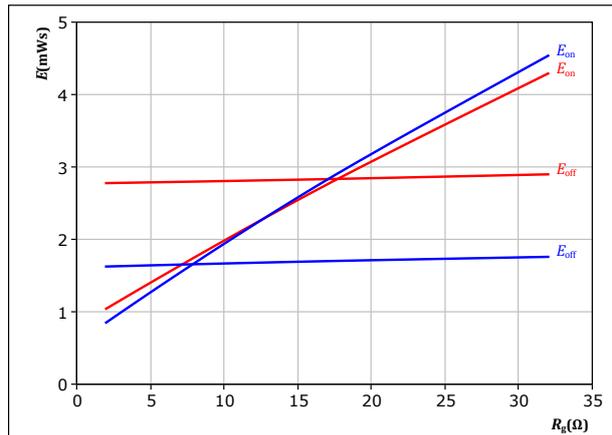
$V_{CE} = 600 \text{ V}$
 $V_{GE} = \pm 15 \text{ V}$
 $R_{gon} = 8 \ \Omega$
 $R_{goff} = 8 \ \Omega$

T_j : — 25 °C
— 125 °C

figure 25. IGBT

Typical switching energy losses as a function of gate resistor

$$E = f(R_g)$$



With an inductive load at

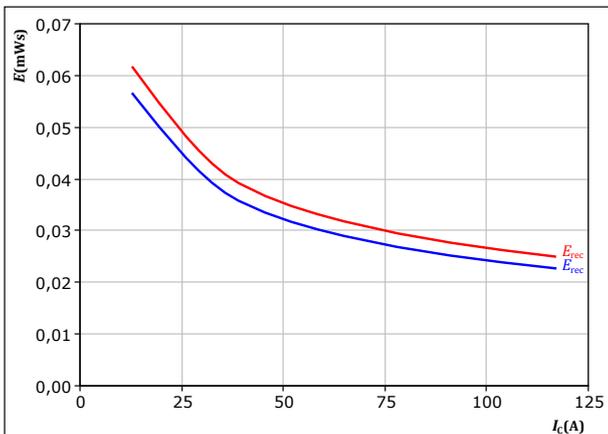
$V_{CE} = 600 \text{ V}$
 $V_{GE} = \pm 15 \text{ V}$
 $I_c = 65 \text{ A}$

T_j : — 25 °C
— 125 °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

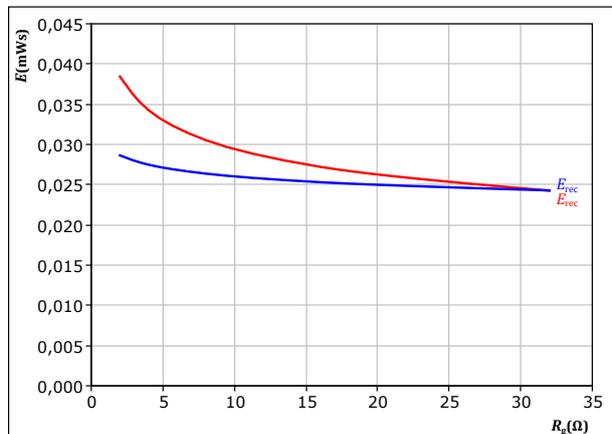
$V_{CE} = 600 \text{ V}$
 $V_{GE} = \pm 15 \text{ V}$
 $R_{gon} = 8 \ \Omega$

T_j : — 25 °C
— 125 °C

figure 27. FWD

Typical reverse recovered energy loss as a function of gate resistor

$$E_{rec} = f(R_g)$$



With an inductive load at

$V_{CE} = 600 \text{ V}$
 $V_{GE} = \pm 15 \text{ V}$
 $I_c = 65 \text{ A}$

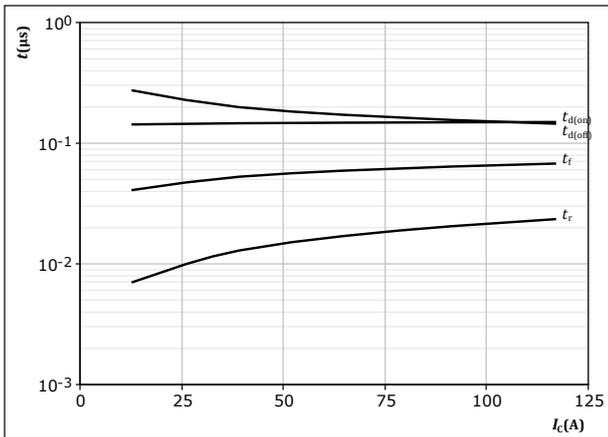
T_j : — 25 °C
— 125 °C



Inner Boost Switching Characteristics

figure 28. IGBT

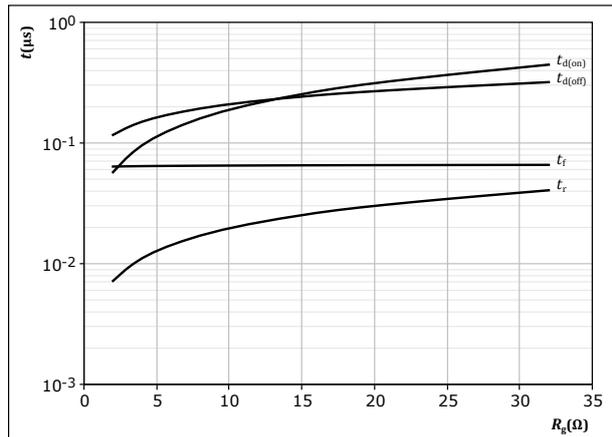
Typical switching times as a function of collector current
 $t = f(I_c)$



With an inductive load at
 $T_j = 125 \text{ }^\circ\text{C}$
 $V_{CE} = 600 \text{ V}$
 $V_{GE} = \pm 15 \text{ V}$
 $R_{gon} = 8 \text{ } \Omega$
 $R_{goff} = 8 \text{ } \Omega$

figure 29. IGBT

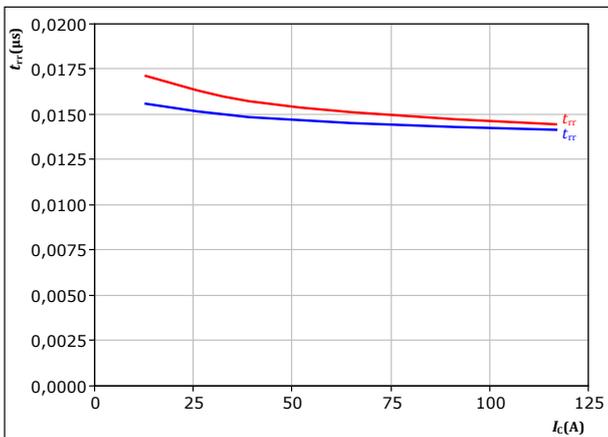
Typical switching times as a function of gate resistor
 $t = f(R_g)$



With an inductive load at
 $T_j = 125 \text{ }^\circ\text{C}$
 $V_{CE} = 600 \text{ V}$
 $V_{GE} = \pm 15 \text{ V}$
 $I_c = 65 \text{ A}$

figure 30. FWD

Typical reverse recovery time as a function of collector current
 $t_{rr} = f(I_c)$

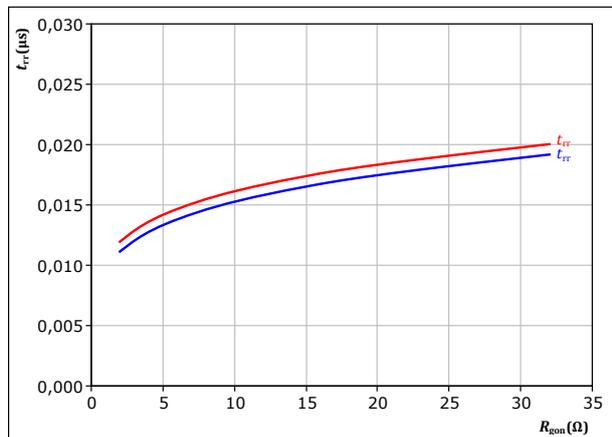


With an inductive load at
 $V_{CE} = 600 \text{ V}$
 $V_{GE} = \pm 15 \text{ V}$
 $R_{gon} = 8 \text{ } \Omega$

T_j : — 25 °C
 — 125 °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
 $V_{CE} = 600 \text{ V}$
 $V_{GE} = \pm 15 \text{ V}$
 $I_c = 65 \text{ A}$

T_j : — 25 °C
 — 125 °C

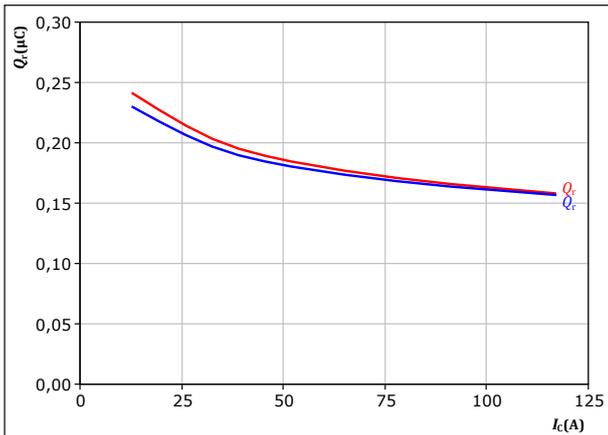


Inner Boost Switching Characteristics

figure 32. FWD

Typical recovered charge as a function of collector current

$$Q_r = f(I_c)$$



With an inductive load at

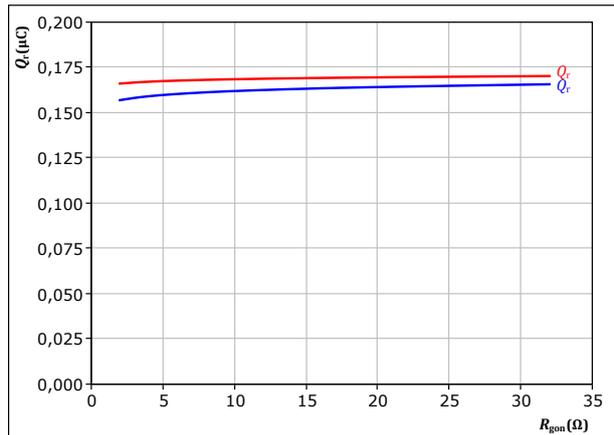
$V_{CE} = 600 \text{ V}$
 $V_{GE} = \pm 15 \text{ V}$
 $R_{gon} = 8 \ \Omega$

T_j : — 25 °C
— 125 °C

figure 33. FWD

Typical recovered charge as a function of turn on gate resistor

$$Q_r = f(R_{gon})$$



With an inductive load at

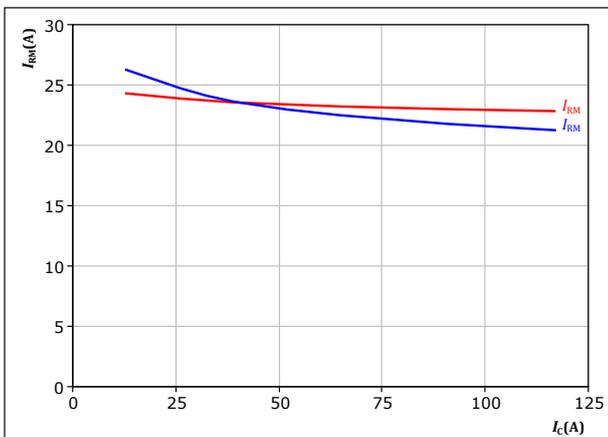
$V_{CE} = 600 \text{ V}$
 $V_{GE} = \pm 15 \text{ V}$
 $I_c = 65 \text{ A}$

T_j : — 25 °C
— 125 °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

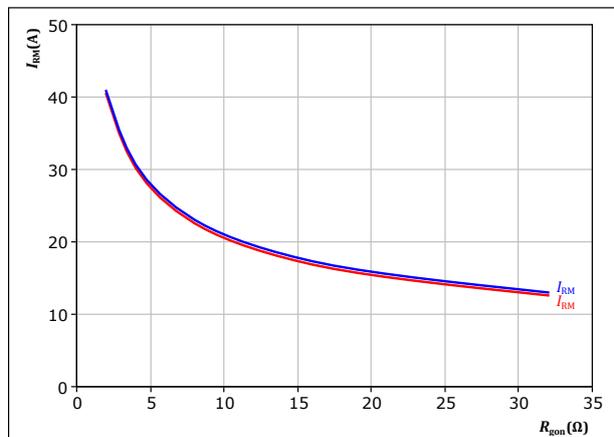
$V_{CE} = 600 \text{ V}$
 $V_{GE} = \pm 15 \text{ V}$
 $R_{gon} = 8 \ \Omega$

T_j : — 25 °C
— 125 °C

figure 35. FWD

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

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



With an inductive load at

$V_{CE} = 600 \text{ V}$
 $V_{GE} = \pm 15 \text{ V}$
 $I_c = 65 \text{ A}$

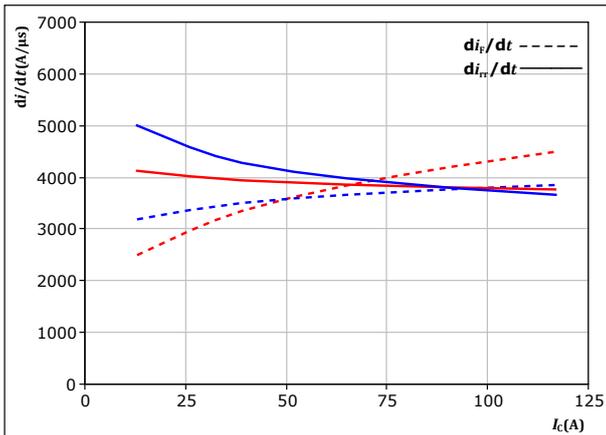
T_j : — 25 °C
— 125 °C



Inner Boost Switching Characteristics

figure 36. FWD

Typical rate of fall of forward and reverse recovery current as a function of collector current
 $di_f/dt, di_r/dt = f(I_c)$



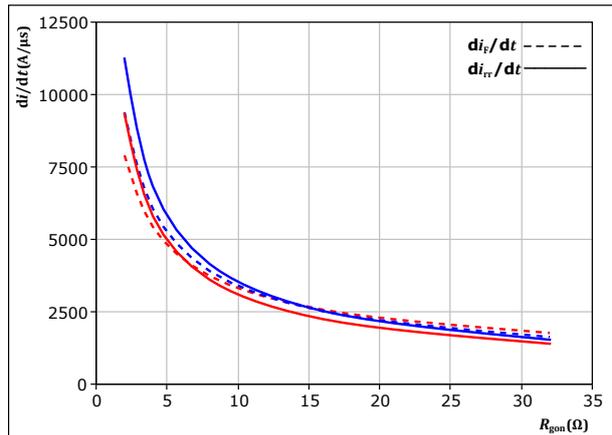
With an inductive load at

$V_{CE} = 600 \text{ V}$
 $V_{GE} = \pm 15 \text{ V}$
 $R_{gon} = 8 \ \Omega$

T_j : — 25 °C
 — 125 °C

figure 37. FWD

Typical rate of fall of forward and reverse recovery current as a function of turn on gate resistor
 $di_f/dt, di_r/dt = f(R_{gon})$



With an inductive load at

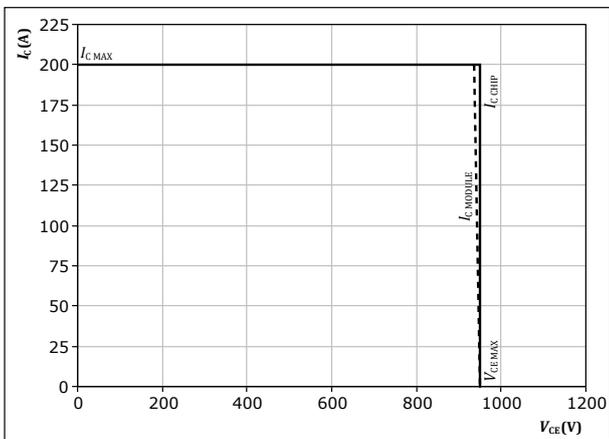
$V_{CE} = 600 \text{ V}$
 $V_{GE} = \pm 15 \text{ V}$
 $I_c = 65 \text{ A}$

T_j : — 25 °C
 — 125 °C

figure 38. IGBT

Reverse bias safe operating area

$I_c = f(V_{CE})$



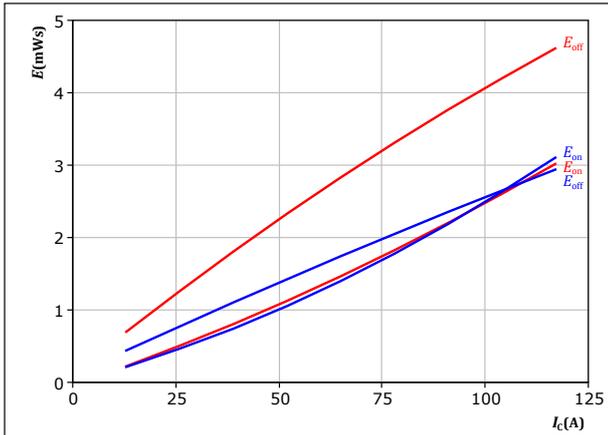
At $T_j = 125 \text{ °C}$
 $R_{gon} = 8 \ \Omega$
 $R_{goff} = 8 \ \Omega$



Outer Boost Switching Characteristics

figure 39. IGBT

Typical switching energy losses as a function of collector current
 $E = f(I_c)$



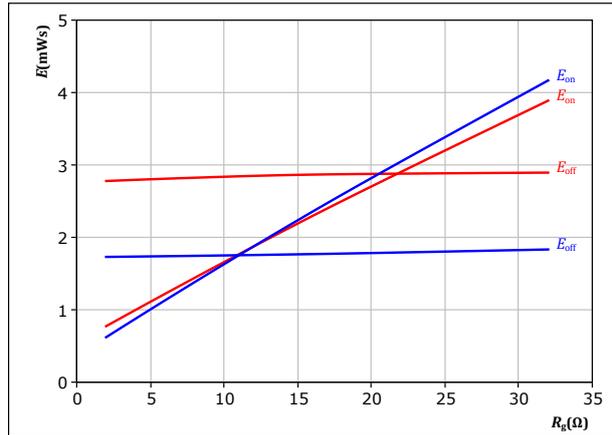
With an inductive load at

$V_{CE} = 600$ V
 $V_{GE} = \pm 15$ V
 $R_{gon} = 8$ Ω
 $R_{goff} = 8$ Ω

T_j : — 25 °C
 — 125 °C

figure 40. IGBT

Typical switching energy losses as a function of gate resistor
 $E = f(R_g)$



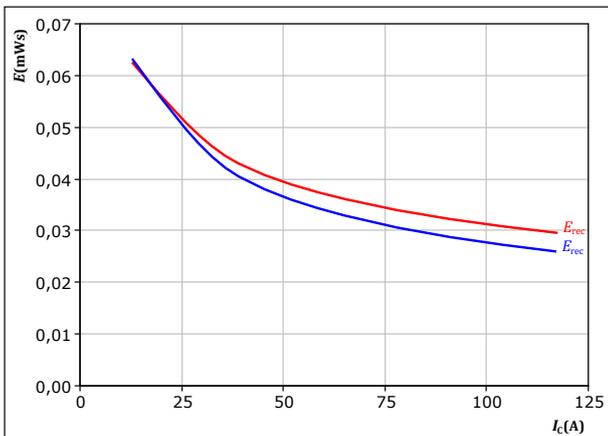
With an inductive load at

$V_{CE} = 600$ V
 $V_{GE} = \pm 15$ V
 $I_c = 65$ A

T_j : — 25 °C
 — 125 °C

figure 41. FWD

Typical reverse recovered energy loss as a function of collector current
 $E_{rec} = f(I_c)$



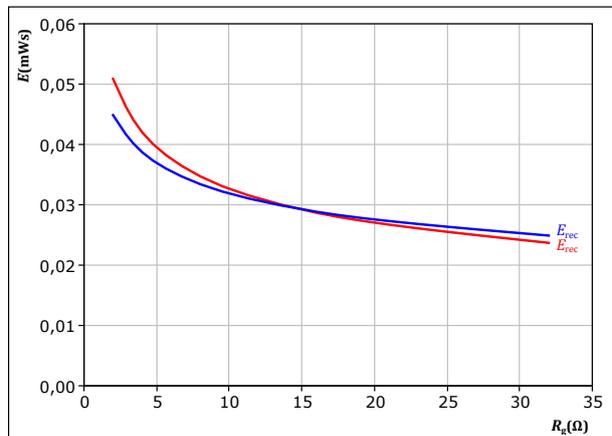
With an inductive load at

$V_{CE} = 600$ V
 $V_{GE} = \pm 15$ V
 $R_{gon} = 8$ Ω

T_j : — 25 °C
 — 125 °C

figure 42. FWD

Typical reverse recovered energy loss as a function of gate resistor
 $E_{rec} = f(R_g)$



With an inductive load at

$V_{CE} = 600$ V
 $V_{GE} = \pm 15$ V
 $I_c = 65$ A

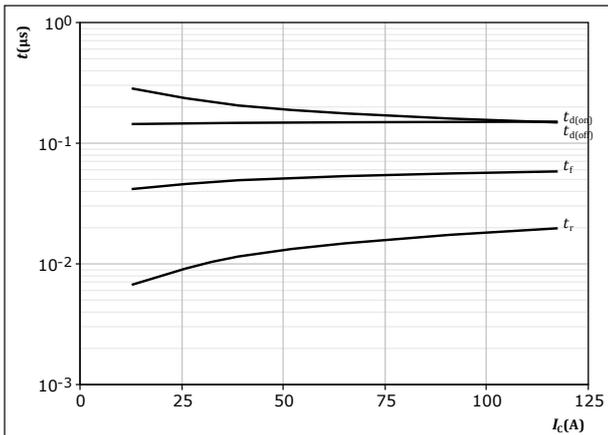
T_j : — 25 °C
 — 125 °C



Outer Boost Switching Characteristics

figure 43. IGBT

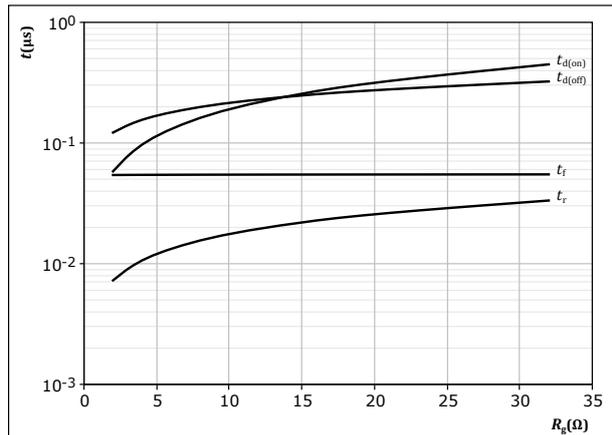
Typical switching times as a function of collector current
 $t = f(I_c)$



With an inductive load at
 $T_j = 125 \text{ }^\circ\text{C}$
 $V_{CE} = 600 \text{ V}$
 $V_{GE} = \pm 15 \text{ V}$
 $R_{gon} = 8 \text{ } \Omega$
 $R_{goff} = 8 \text{ } \Omega$

figure 44. IGBT

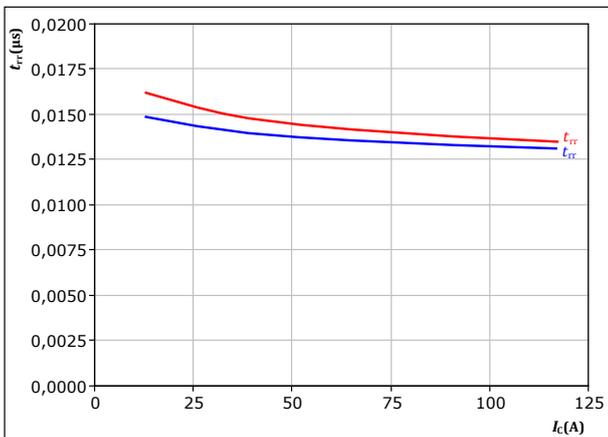
Typical switching times as a function of gate resistor
 $t = f(R_g)$



With an inductive load at
 $T_j = 125 \text{ }^\circ\text{C}$
 $V_{CE} = 600 \text{ V}$
 $V_{GE} = \pm 15 \text{ V}$
 $I_c = 65 \text{ A}$

figure 45. FWD

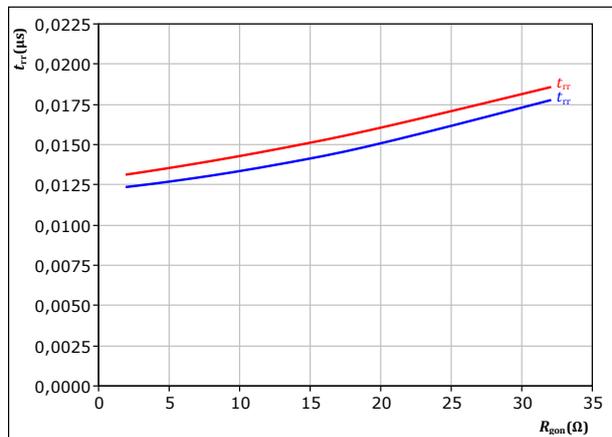
Typical reverse recovery time as a function of collector current
 $t_{rr} = f(I_c)$



With an inductive load at
 $V_{CE} = 600 \text{ V}$
 $V_{GE} = \pm 15 \text{ V}$
 $R_{gon} = 8 \text{ } \Omega$
 $T_j: \text{ — } 25 \text{ }^\circ\text{C}$
 $\text{ — } 125 \text{ }^\circ\text{C}$

figure 46. FWD

Typical reverse recovery time as a function of IGBT turn on gate resistor
 $t_{rr} = f(R_{gon})$



With an inductive load at
 $V_{CE} = 600 \text{ V}$
 $V_{GE} = \pm 15 \text{ V}$
 $I_c = 65 \text{ A}$
 $T_j: \text{ — } 25 \text{ }^\circ\text{C}$
 $\text{ — } 125 \text{ }^\circ\text{C}$

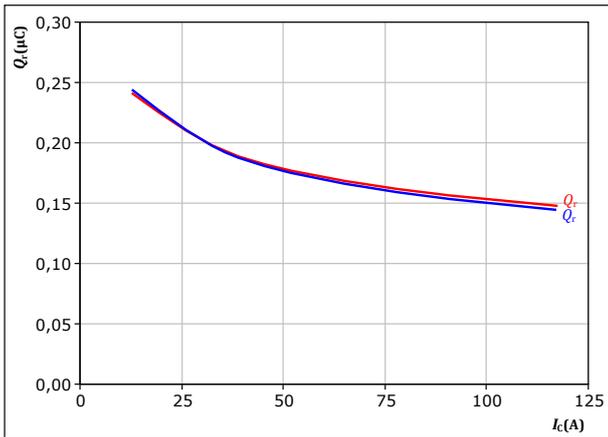


Outer Boost Switching Characteristics

figure 47. FWD

Typical recovered charge as a function of collector current

$$Q_r = f(I_c)$$



With an inductive load at

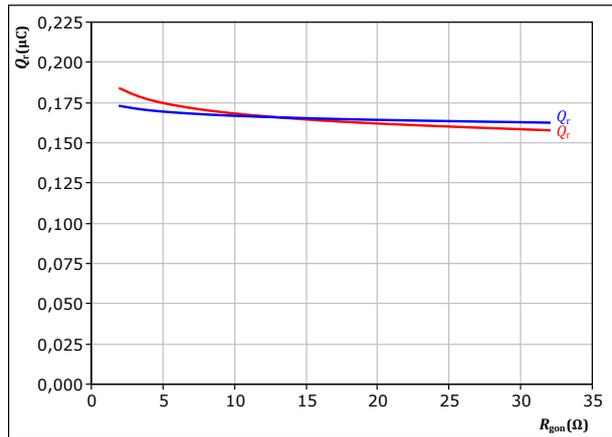
$V_{CE} = 600$ V
 $V_{GE} = \pm 15$ V
 $R_{gon} = 8$ Ω

T_j : — 25 °C
— 125 °C

figure 48. FWD

Typical recovered charge as a function of turn on gate resistor

$$Q_r = f(R_{gon})$$



With an inductive load at

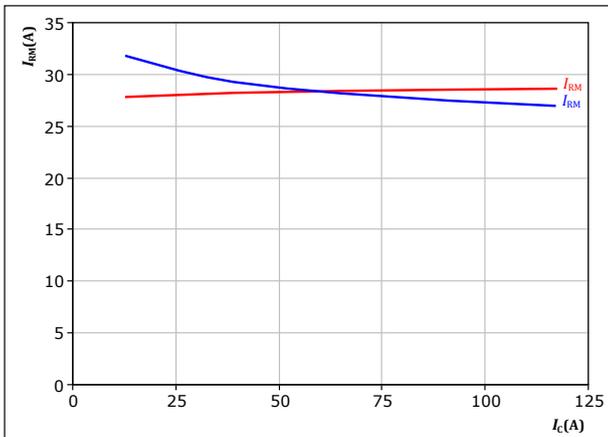
$V_{CE} = 600$ V
 $V_{GE} = \pm 15$ V
 $I_c = 65$ A

T_j : — 25 °C
— 125 °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

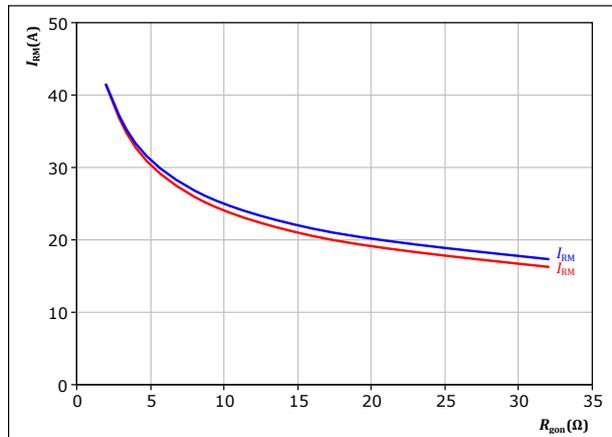
$V_{CE} = 600$ V
 $V_{GE} = \pm 15$ V
 $R_{gon} = 8$ Ω

T_j : — 25 °C
— 125 °C

figure 50. FWD

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

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



With an inductive load at

$V_{CE} = 600$ V
 $V_{GE} = \pm 15$ V
 $I_c = 65$ A

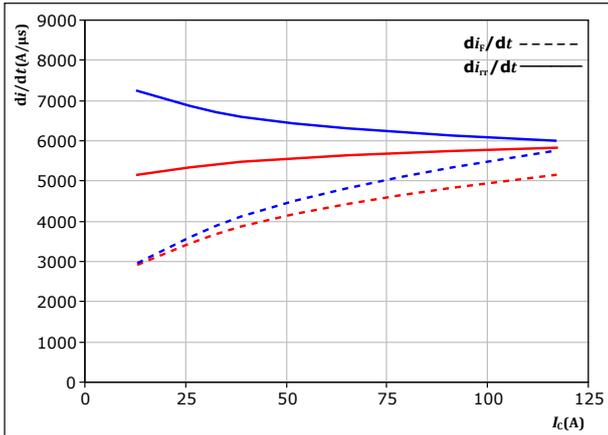
T_j : — 25 °C
— 125 °C



Outer Boost Switching Characteristics

figure 51. FWD

Typical rate of fall of forward and reverse recovery current as a function of collector current
 $di_f/dt, di_r/dt = f(I_C)$



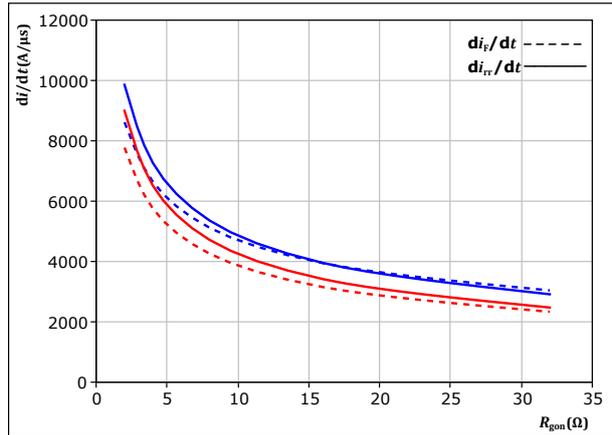
With an inductive load at

$V_{CE} = 600 \text{ V}$
 $V_{GE} = \pm 15 \text{ V}$
 $R_{gon} = 8 \text{ } \Omega$

T_j : — 25 °C
 — 125 °C

figure 52. FWD

Typical rate of fall of forward and reverse recovery current as a function of turn on gate resistor
 $di_f/dt, di_r/dt = f(R_{gon})$



With an inductive load at

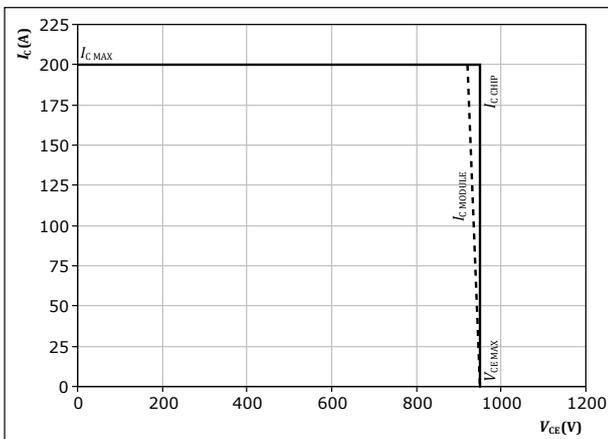
$V_{CE} = 600 \text{ V}$
 $V_{GE} = \pm 15 \text{ V}$
 $I_C = 65 \text{ A}$

T_j : — 25 °C
 — 125 °C

figure 53. IGBT

Reverse bias safe operating area

$I_C = f(V_{CE})$



At $T_j = 125 \text{ } ^\circ\text{C}$
 $R_{gon} = 8 \text{ } \Omega$
 $R_{goff} = 8 \text{ } \Omega$



Switching Definitions

figure 54. IGBT

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

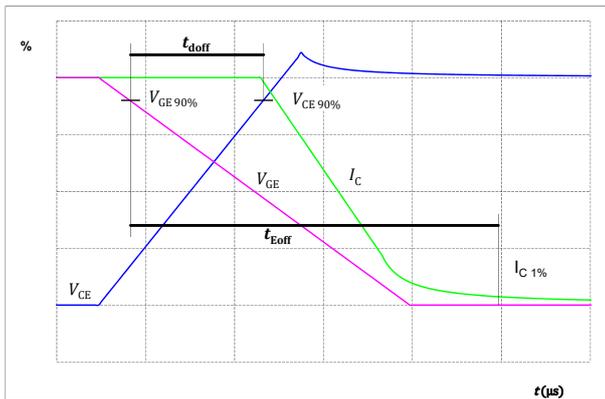


figure 55. IGBT

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

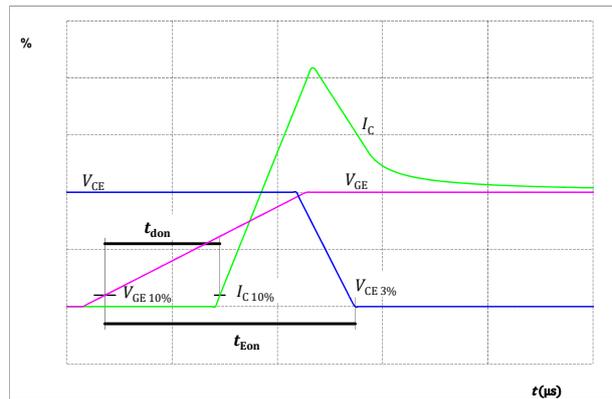


figure 56. IGBT

Turn-off Switching Waveforms & definition of t_f

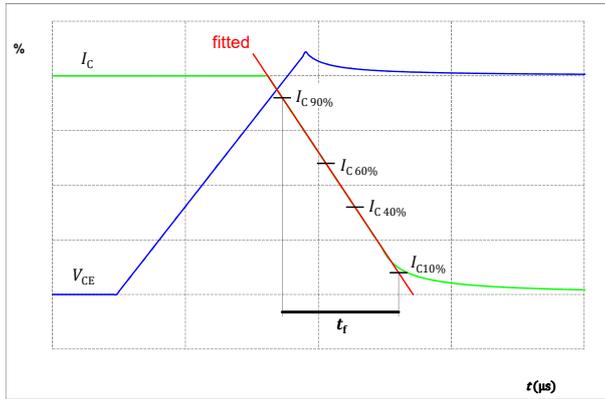
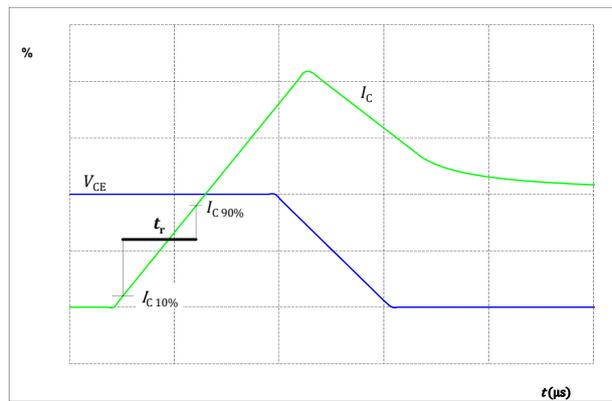


figure 57. IGBT

Turn-on Switching Waveforms & definition of t_r





Switching Definitions

figure 58. FWD

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

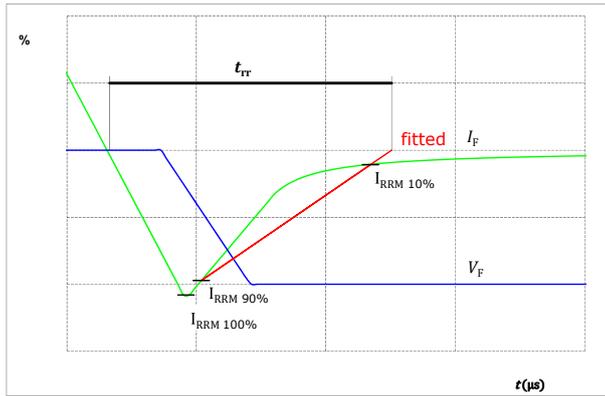
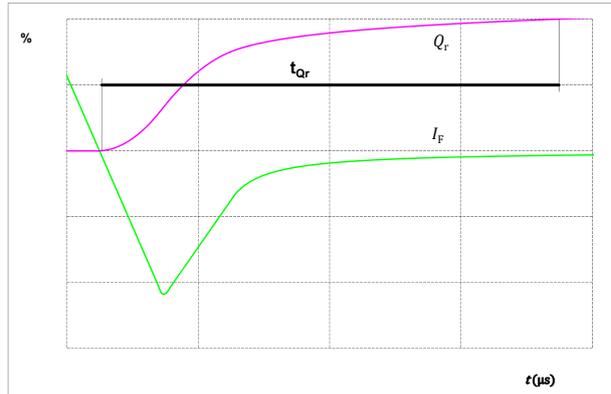


figure 59. FWD

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





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B0-SL103BA100S714-LS60L98Z
datasheet

Ordering Code	
Version	Ordering Code
With thermal paste	B0-SL103BA100S714-LS60L98Z-/7/

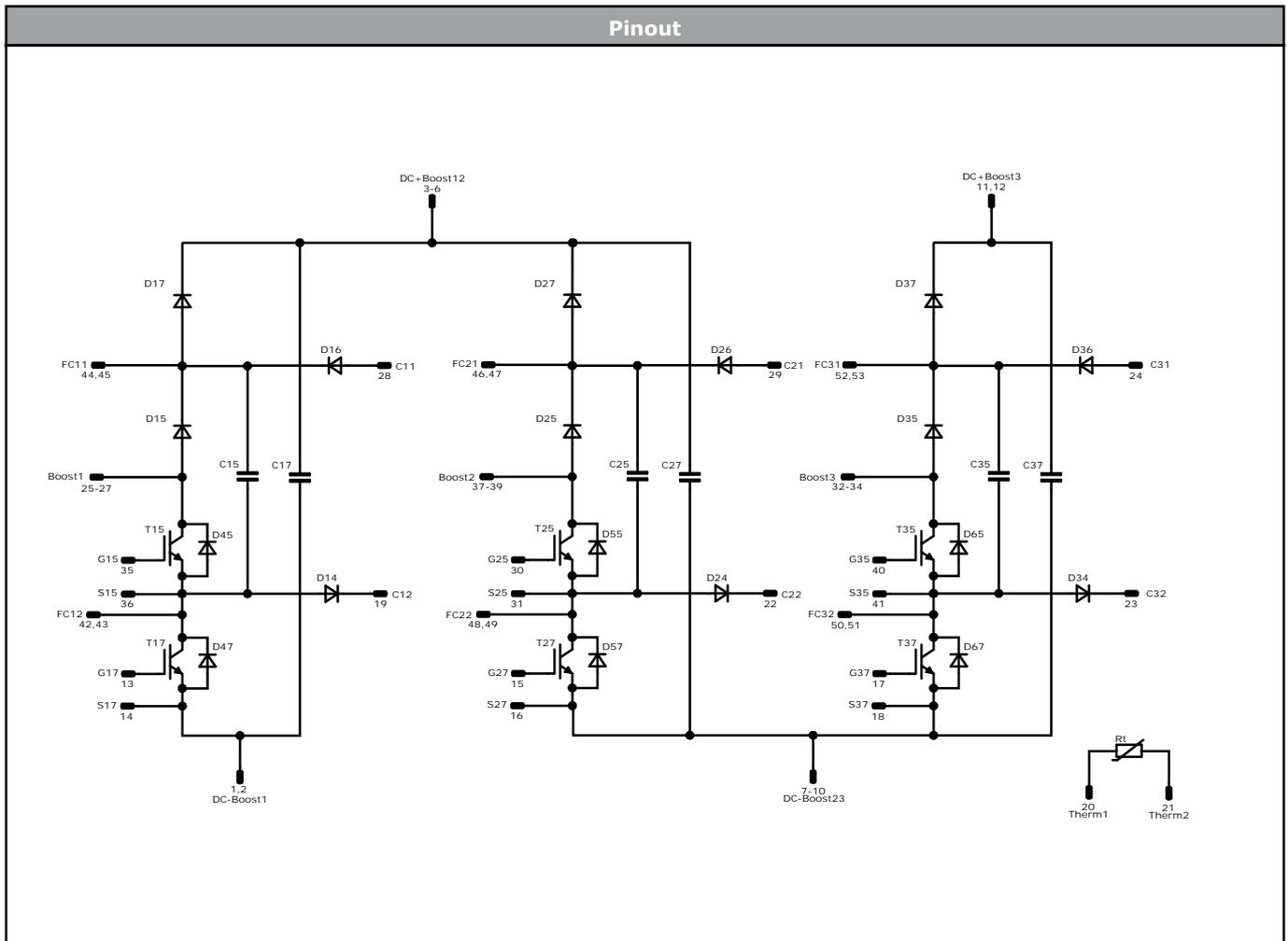
Marking						
	Text	Name NN-NNNNNNNNNNNNNN- TTTTTTVV	Date code WWYY	Logo VIN	Lot LLLLL	Serial SSSS
	Datamatrix	Type&Ver TTTTTTVV	Lot number LLLLL	Serial SSSS	Date code WWYY	

Outline							
Pin table [mm]							
Pin	X	Y	Function	28	11,75	19,5	C11
1	0	50,4	DC-Boost1	29	22,85	19,45	C21
2	2,7	50,4	DC-Boost1	30	34,1	21	G25
3	12,7	50,4	DC+Boost12	31	34,1	18	S25
4	15,4	50,4	DC+Boost12	32	45,4	18,55	Boost3
5	18,5	50,4	DC+Boost12	33	45,4	15,85	Boost3
6	21,2	50,4	DC+Boost12	34	45,4	13,15	Boost3
7	31,2	50,4	DC-Boost23	35	0	9,8	G15
8	33,9	50,4	DC-Boost23	36	0	6,8	S15
9	37	50,4	DC-Boost23	37	34	12,2	Boost2
10	39,7	50,4	DC-Boost23	38	34	9,5	Boost2
11	49,7	50,4	DC+Boost3	39	33,25	6,8	Boost2
12	52,4	50,4	DC+Boost3	40	45,4	7,3	G35
13	0	42,25	G17	41	45,4	4,3	S35
14	0	39,25	S17	42	0	2,7	FC12
15	33,2	44	G27	43	0	0	FC12
16	33,2	41	S27	44	9,55	2,7	FC11
17	44,95	41,6	G37	45	9,55	0	FC11
18	44,95	38,6	S37	46	18,55	2,7	FC21
19	0	29,7	C12	47	18,55	0	FC21
20	15,55	30	Therm1	48	28,35	0	FC22
21	18,75	30	Therm2	49	31,05	0	FC22
22	30,6	29,7	C22	50	42,4	2,7	FC32
23	40,6	29,7	C32	51	42,9	0	FC32
24	46,1	27,85	C31	52	52,4	2,7	FC31
25	0	21	Boost1	53	52,4	0	FC31
26	0	18,3	Boost1				
27	0	15,6	Boost1				

Dimensions of components: *Values at the end of pins.
Dimension of component pins is only shown in this datasheet.



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Identification					
ID	Component	Voltage	Current	Function	Comment
T15, T25, T35	IGBT	950 V	100 A	Inner Boost Switch	
T17, T27, T37	IGBT	950 V	100 A	Outer Boost Switch	
D15, D25, D35	FWD	1200 V	40 A	Inner Boost Diode	
D17, D27, D37	FWD	1200 V	40 A	Outer Boost Diode	
D45, D55, D65	FWD	1200 V	35 A	Inner Boost Sw. Protection Diode	
D47, D57, D67	FWD	1200 V	35 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	
C15, C25, C35	Capacitor	1000 V		Flying Capacitor	
C17, C27, C37	Capacitor	1500 V		Capacitor (DC)	
Rt	Thermistor			Thermistor	



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

Handling instruction
Handling instructions for <i>flow</i> S3 packages see vincotech.com website.

Package data
Package data for <i>flow</i> S3 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
B0-SL103BA100S714-LS60L98Z-D1-14	26 Feb. 2021		

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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.