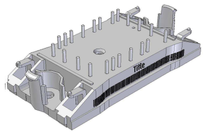
flowSOL 0 BI 600 V / 30 A

Features

- High efficiency
- Ultra fast switching frequency
- Low inductive design
- SiC in boost

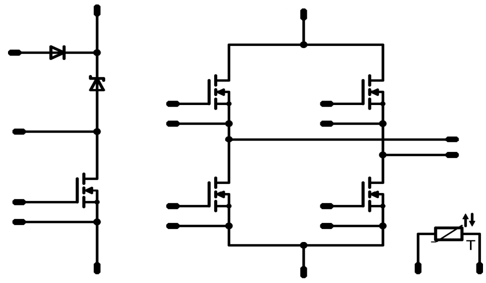
flow0 housing



Target Applications

- Solar inverters with transformer

Schematic



Types

- 10-FZ06BIA083FI-P896E

Maximum Ratings

T_j=25°C, unless otherwise specified

Parameter	Symbol	Condition		Value	Unit
Bypass FWD					
Repetitive peak reverse voltage	V_{RRM}			600	V
Forward current per FWD	I_{FAV}	DC current	T_h=80°C T_c=80°C	36 49	A
Surge forward current	I_{FSM}	t_p=10ms	T_j=25°C	370	A
I2t-value	I^2t	t_p=10ms	T_j=150°C	360	A^2s
Power dissipation per FWD	P_{tot}	T_j=$T_j$max	T_h=80°C T_c=80°C	42 63	W
Maximum Junction Temperature	T_{jmax}			150	°C
Input Boost MOSFET					
Drain to source breakdown voltage	V_{DS}			600	V
DC drain current	I_D	T_j=$T_j$max	T_h=80°C T_c=80°C	30 37	A
Pulsed drain current	I_{Dpulse}	t_p limited by $T_j$max		230	A
Power dissipation	P_{tot}	T_j=$T_j$max	T_h=80°C T_c=80°C	92 139	W
Gate-source peak voltage	V_{GS}			±20	V
Maximum Junction Temperature	T_{jmax}			150	°C

Maximum Ratings

T_j=25°C, unless otherwise specified

Parameter	Symbol	Condition		Value	Unit
Input Boost FWD					
Peak Repetitive Reverse Voltage	V_{RRM}	T_j=25°C		600	V
DC forward current	I_F	T_j=$T_j$max	T_h=80°C T_c=80°C	20 25	A
Repetitive peak forward current	I_{FRM}	t_p limited by $T_j$max		70	A
Power dissipation	P_{tot}	T_j=$T_j$max	T_h=80°C T_c=80°C	41 62	W
Maximum Junction Temperature	T_{jmax}			175	°C
Boost and Buck MOSFET					
Drain to source breakdown voltage	V_{DS}			600	V
DC drain current	I_D	T_j=$T_j$max	T_h=80°C T_c=80°C	17 20	A
Pulsed drain current	I_{Dpulse}	t_p limited by $T_j$max	Tc=25°C	85	A
Power dissipation	P_{tot}	T_j=$T_j$max	T_h=80°C T_c=80°C	74 111	W
Gate-source peak voltage	V_{GS}			±20	V
Maximum Junction Temperature	T_{jmax}			150	°C
Thermal Properties					
Storage temperature	T_{stg}			-40…+125	°C
Operation temperature under switching condition	T_{op}			-40…+(Tjmax - 25)	°C
Insulation Properties					
Insulation voltage	V_{is}	t=2s	DC voltage	4000	V
Creepage distance				min 12,7	mm
Clearance				8,96	mm

Characteristic Values

Parameter	Symbol	Conditions	V_{GE} [V] or V_{GS} [V]	V_r [V] or V_{CE} [V] or V_{DS} [V]	I_C [A] or I_F [A] or I_D [A]	T_j	Value Min	Value Typ	Value Max	Unit
Bypass FWD										
Forward voltage	V_F				15	Tj=25°C Tj=125°C	0,7	1,01 0,93	1,3	V
Threshold voltage (for power loss calc. only)	V_{to}					Tj=25°C Tj=125°C		0,86 0,75		V
Slope resistance (for power loss calc. only)	r_t					Tj=25°C Tj=125°C		0,012		Ω
Reverse current	I_r			1200		Tj=25°C Tj=125°C			0,05	mA
Thermal resistance chip to heatsink	$R_{th(j-s)}$	Thermal grease thickness≤50um λ = 1 W/mK						1,68		K/W
Input Boost MOSFET										
Static drain to source ON resistance	$r_{DS(on)}$		10		44	Tj=25°C Tj=125°C		0,04 0,09		Ω
Gate threshold voltage	$V_{(GS)th}$	VGS=VDS			0,003	Tj=25°C Tj=125°C	2,1	3	3,9	V
Gate to Source Leakage Current	I_{GSS}		20	0		Tj=25°C Tj=125°C			200	nA
Zero Gate Voltage Drain Current	I_{DSS}		0	600		Tj=25°C Tj=125°C			25	µA
Turn On Delay Time	$t_{d(on)}$	Rgoff=4 Ω Rgon=4 Ω	10	400	15	Tj=25°C Tj=125°C		28 27		ns
Rise Time	t_r					Tj=25°C Tj=125°C		5 6		
Turn off delay time	$t_{d(off)}$					Tj=25°C Tj=125°C		154 167		
Fall time	t_f					Tj=25°C Tj=125°C		10 9		
Turn-on energy loss	E_{on}					Tj=25°C Tj=125°C		0,063 0,072		mWs
Turn-off energy loss	E_{off}					Tj=25°C Tj=125°C		0,025 0,025		
Total gate charge	Q_G	Rgon=4 Ω	10	400	44	Tj=25°C Tj=125°C		150		nC
Gate to source charge	Q_{GS}					Tj=25°C Tj=125°C		34		
Gate to drain charge	Q_{GD}					Tj=25°C Tj=125°C		51		
Input capacitance	C_{iss}	f=1MHz	0	100		Tj=25°C		6800		pF
Output capacitance	C_{oss}							320		
Reverse transfer capacitance	C_{rss}							48		
Thermal resistance chip to heatsink	$R_{th(j-s)}$	Thermal grease thickness≤50um λ = 1 W/mK						0,76		K/W
Input Boost FWD										
Forward voltage	V_F				16	Tj=25°C Tj=150°C	1	1,54 1,71	1,8	V
Reverse leakage current	I_{rm}		10	400	15	Tj=25°C Tj=150°C			400	µA
Peak recovery current	I_{RRM}	Rgon=4 Ω	10	400	15	Tj=25°C Tj=150°C		17 15		A
Reverse recovery time	t_{rr}					Tj=25°C Tj=150°C		9 10		ns
Reverse recovery charge	Q_{rr}					Tj=25°C Tj=150°C		0,058 0,064		µC
Reverse recovered energy	E_{rec}					Tj=25°C Tj=150°C		0,005 0,006		mWs
Peak rate of fall of recovery current	$(di_{rf}/dt)_{max}$					Tj=25°C Tj=150°C		4244 2752		A/µs
Thermal resistance chip to heatsink	$R_{th(j-s)}$	Thermal grease thickness≤50um λ = 1 W/mK						2,34		K/W

Characteristic Values

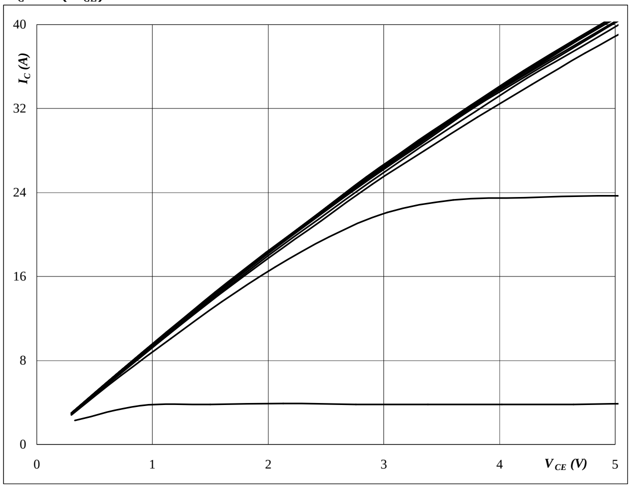
Parameter	Symbol	Conditions					Value			Unit
			V_{GE} [V] or V_{GS} [V]	V_r [V] or V_{CE} [V] or V_{DS} [V]	I_C [A] or I_F [A] or I_D [A]	T_j	Min	Typ	Max	
Boost and Buck MOSFET										
Static drain to source ON resistance	$r_{DS(on)}$		10		21,6	Tj=25°C Tj=125°C		118 233		mΩ
Gate threshold voltage	$V_{GS(th)}$		VDS=VGS		0,0019	Tj=25°C Tj=125°C	3	4	5	V
Gate to Source Leakage Current	I_{GSS}		20	0		Tj=25°C Tj=125°C			200	nA
Zero Gate Voltage Drain Current	I_{DSS}		0	600		Tj=25°C Tj=125°C			25	µA
Turn On Delay Time	$t_{d(on)}$	Rgon=16 Ω Rgoff=4 Ω	10	400	15	Tj=25°C Tj=125°C		58 55		ns
Rise Time	t_r					Tj=25°C Tj=125°C		22 23		
Turn off delay time	$t_{d(off)}$					Tj=25°C Tj=125°C		126 134		
Fall time	t_f					Tj=25°C Tj=125°C		6 8		
Turn-on energy loss	E_{on}					Tj=25°C Tj=125°C		1,54 2,27		mWs
Turn-off energy loss	E_{off}					Tj=25°C Tj=125°C		0,01 0,02		
Total gate charge	Q_G		10	480	46	Tj=25°C		163		nC
Gate to source charge	Q_{GS}							36		
Gate to drain charge	Q_{GD}							87		
Input capacitance	C_{iss}	f=1MHz	0	25		Tj=25°C		5060		pF
Output capacitance	C_{oss}							1400		
Reverse transfer capacitance	C_{rss}							16		
Thermal resistance chip to heatsink	$R_{th(j-s)}$	Thermal grease thickness≤50um λ = 1 W/mK						0,95		K/W
Thermistor										
Rated resistance	R					Tj=25°C		4,7		kΩ
Power dissipation	P					Tj=25°C		210		mW
Power dissipation constant						Tj=25°C		3,5		mW/K
B-value	$B_{(25/50)}$					Tj=25°C		3590		K
B-value	$B_{(25/100)}$					Tj=25°C		3650		K
Vincotech NTC Reference									D	

Boost and Buck

Figure 1 MOSFET

Typical output characteristics

$I_C = f(V_{CE})$



At

t_p = 250 µs

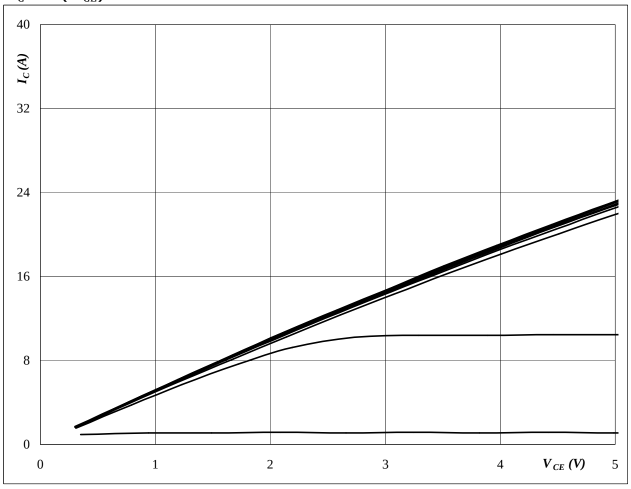
T_j = 25 °C

V_{GE} from 6 V to 16 V in steps of 1 V

Figure 2 MOSFET

Typical output characteristics

$I_C = f(V_{CE})$



At

t_p = 250 µs

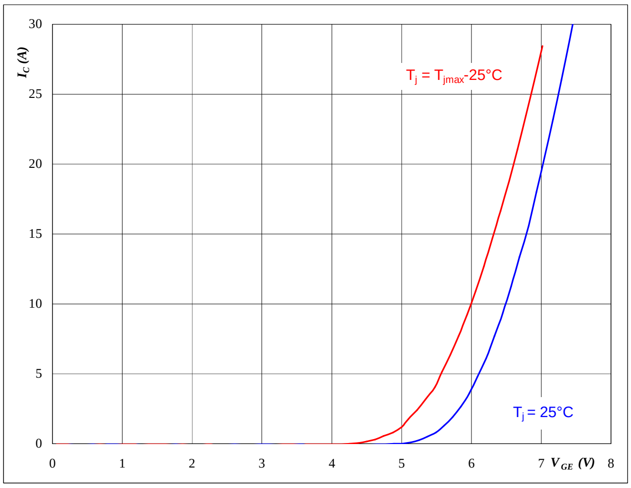
T_j = 125 °C

V_{GE} from 6 V to 16 V in steps of 1 V

Figure 3 MOSFET

Typical transfer characteristics

$I_C = f(V_{GE})$



At

t_p = 250 µs

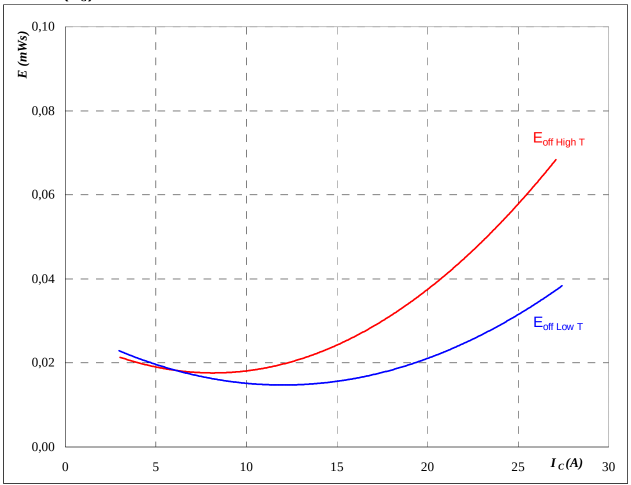
V_{CE} = 10 V

Boost and Buck

Figure 4 MOSFET

Typical switching energy losses as a function of collector current

$E = f(I_C)$



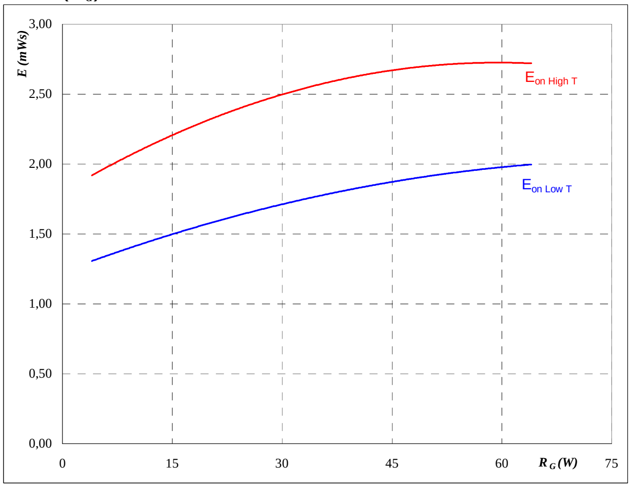
With an inductive load at

T_j =	25/125	°C
V_{CE} =	400	V
V_{GE} =	10	V
R_{gon} =	16	Ω
R_{goff} =	4	Ω

Figure 5 MOSFET

Typical switching energy losses as a function of gate resistor

$E = f(R_G)$



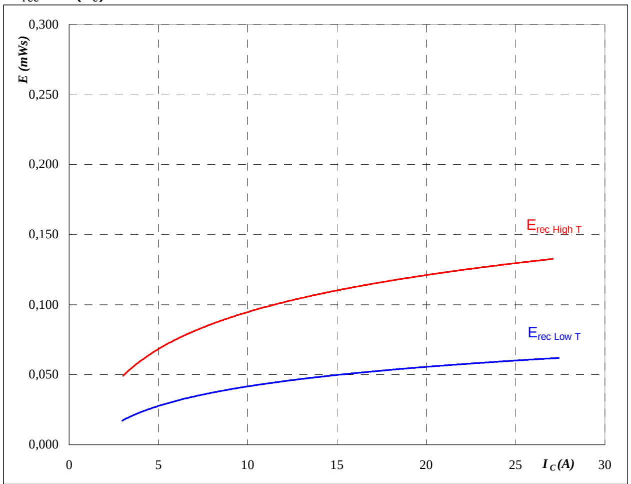
With an inductive load at

T_j =	25/125	°C
V_{CE} =	400	V
V_{GE} =	10	V
I_C =	15	A

Figure 6 FWD

Typical reverse recovery energy loss as a function of collector current

$E_{rec} = f(I_c)$



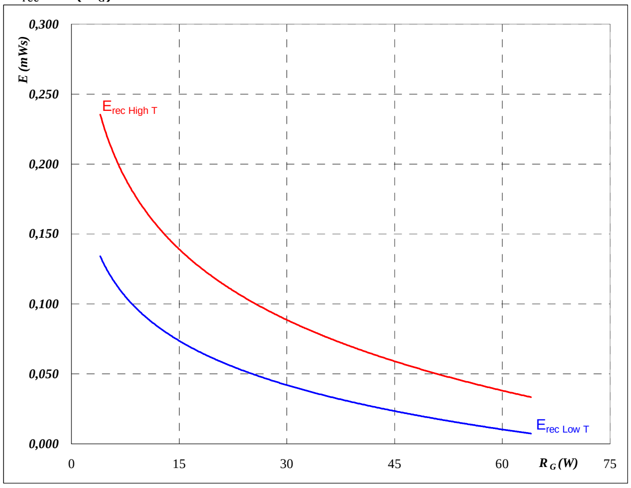
With an inductive load at

T_j =	25/125	°C
V_{CE} =	400	V
V_{GE} =	10	V
R_{gon} =	16	Ω

Figure 7 FWD

Typical reverse recovery energy loss as a function of gate resistor

$E_{rec} = f(R_G)$



With an inductive load at

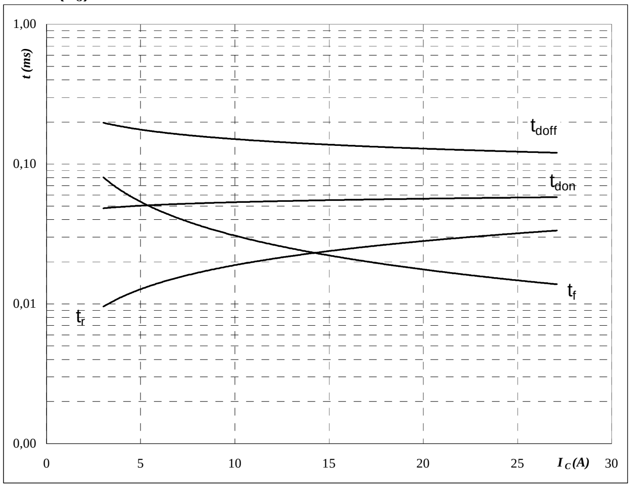
T_j =	25/125	°C
V_{CE} =	400	V
V_{GE} =	10	V
I_C =	15	A

Boost and Buck

Figure 8 MOSFET

Typical switching times as a function of collector current

$t = f(I_C)$



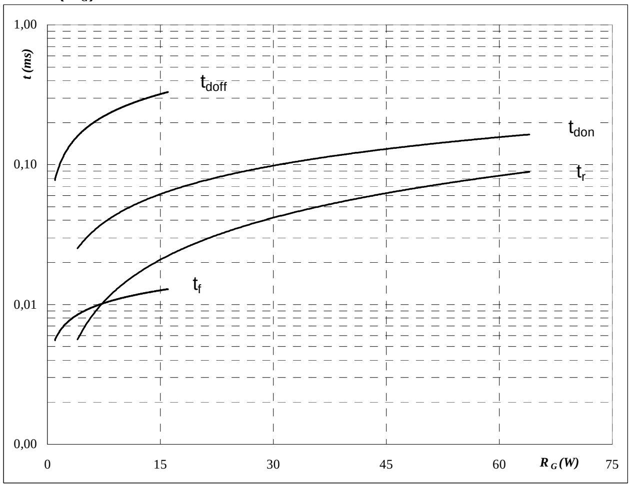
With an inductive load at

T_j =	125	°C
V_{CE} =	400	V
V_{GE} =	10	V
R_{gon} =	16	Ω
R_{goff} =	4	Ω

Figure 9 MOSFET

Typical switching times as a function of gate resistor

$t = f(R_G)$



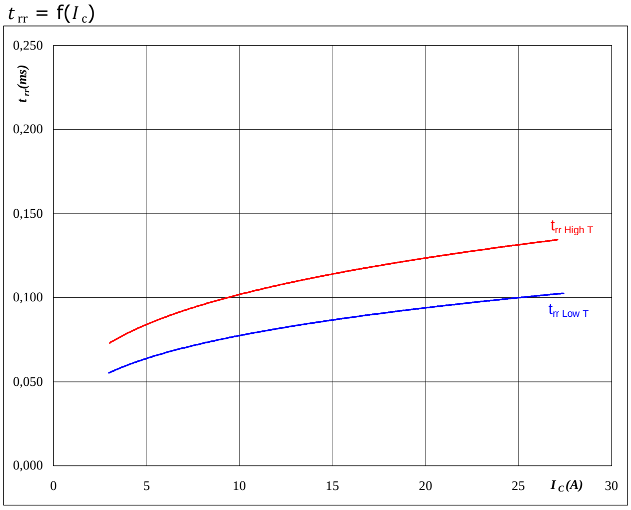
With an inductive load at

T_j =	125	°C
V_{CE} =	400	V
V_{GE} =	10	V
I_C =	15	A

Figure 10 FWD

Typical reverse recovery time as a function of collector current

$t_{rr} = f(I_c)$



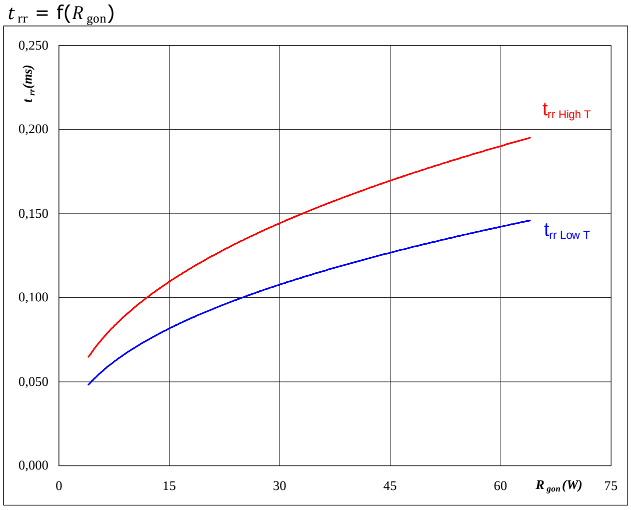
At

T_j =	25/125	°C
V_{CE} =	400	V
V_{GE} =	10	V
R_{gon} =	16	Ω

Figure 11 FWD

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

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



At

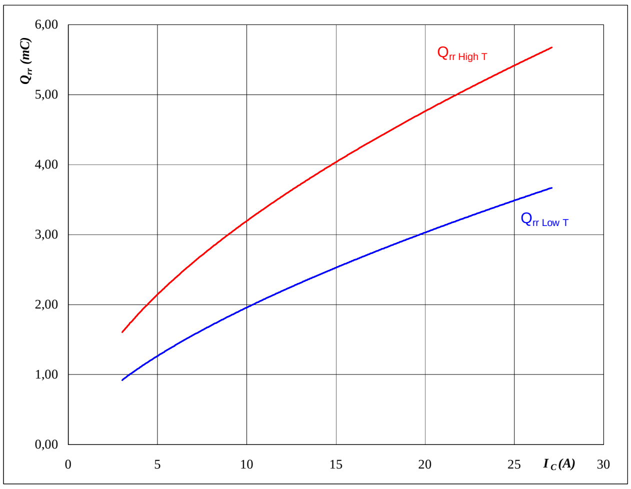
T_j =	25/125	°C
V_R =	400	V
I_F =	15	A
V_{GE} =	10	V

Boost and Buck

Figure 12 FWD

Typical reverse recovery charge as a function of collector current

$Q_{rr} = f(I_C)$



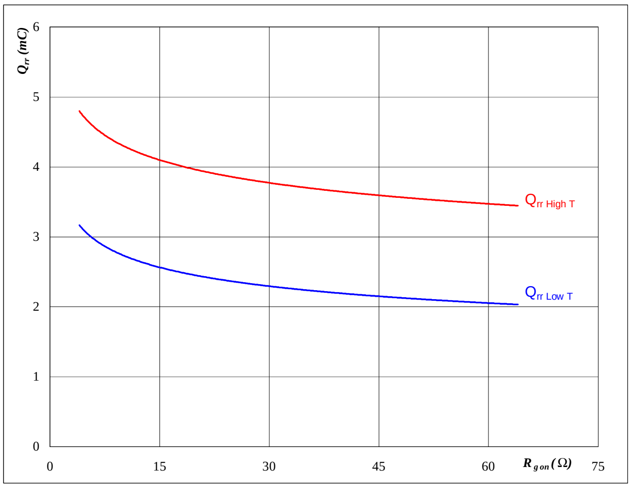
At

T_j =	25/125	°C
V_{CE} =	400	V
V_{GE} =	10	V
R_{gon} =	16	Ω

Figure 13 FWD

Typical reverse recovery charge as a function of MOSFET turn on gate resistor

$Q_{rr} = f(R_{gon})$



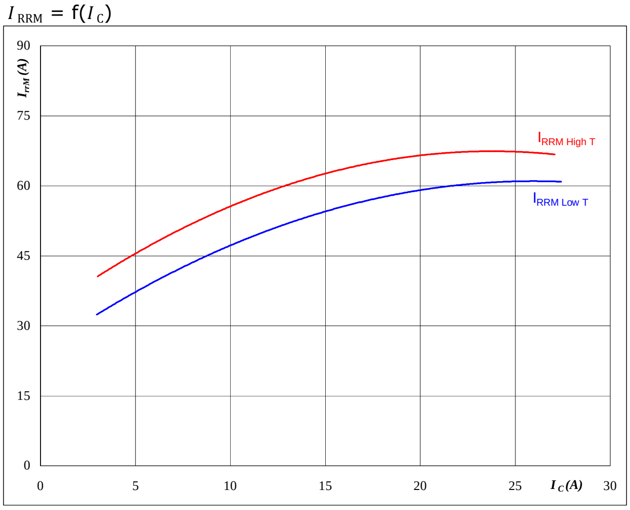
At

T_j =	25/125	°C
V_R =	400	V
I_F =	15	A
V_{GE} =	10	V

Figure 14 FWD

Typical reverse recovery current as a function of collector current

$I_{RRM} = f(I_C)$



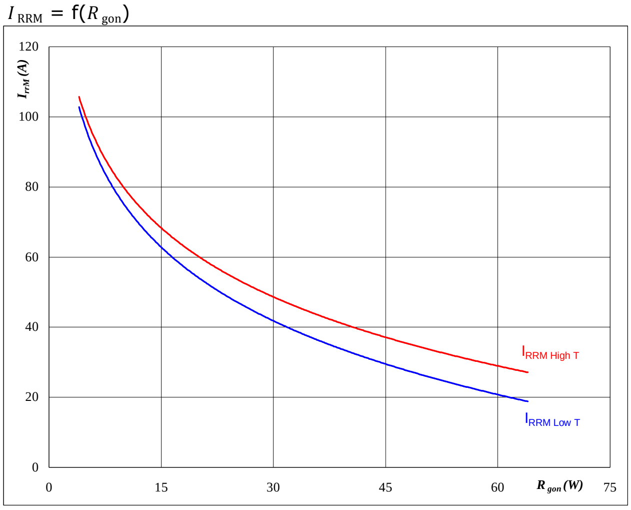
At

T_j =	25/125	°C
V_{CE} =	400	V
V_{GE} =	10	V
R_{gon} =	16	Ω

Figure 15 FWD

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

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



At

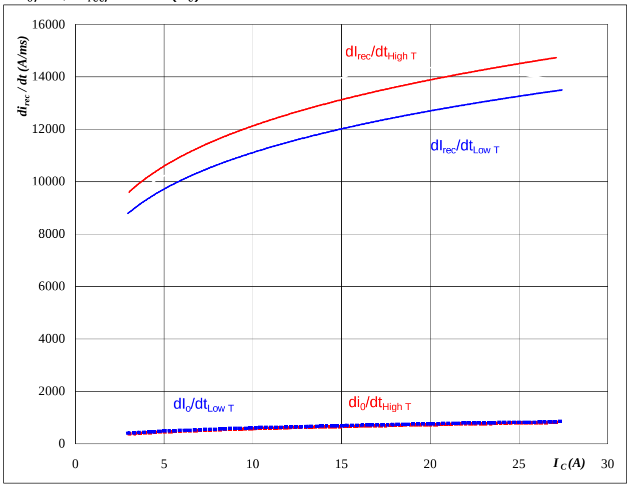
T_j =	25/125	°C
V_R =	400	V
I_F =	15	A
V_{GE} =	10	V

Boost and Buck

Figure 16 FWD

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

$dI_0/dt, dI_{rec}/dt = f(I_c)$



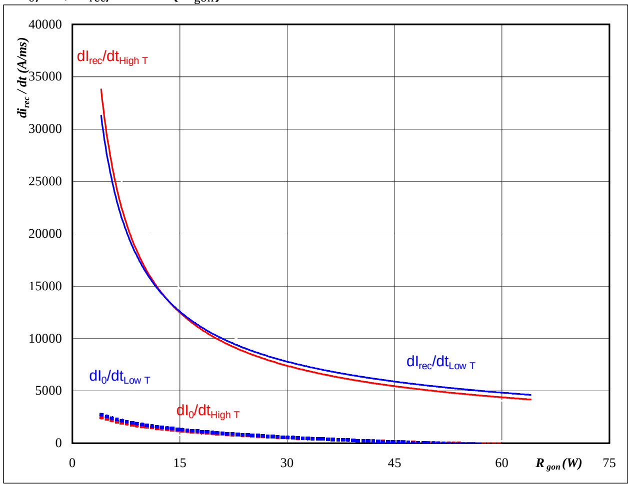
At

T_j =	25/125	°C
V_{CE} =	400	V
V_{GE} =	10	V
R_{gon} =	16	Ω

Figure 17 FWD

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

$dI_0/dt, dI_{rec}/dt = f(R_{gon})$



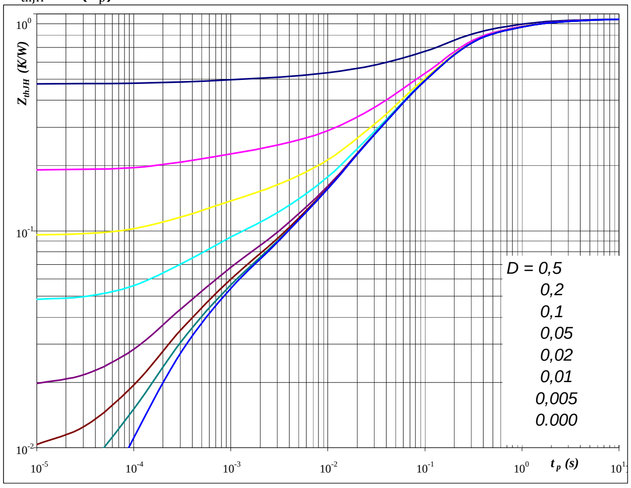
At

T_j =	25/125	°C
V_R =	400	V
I_F =	15	A
V_{GE} =	10	V

Figure 18 MOSFET

MOSFET transient thermal impedance as a function of pulse width

$Z_{thJH} = f(t_p)$



At

D =	t_p / T	
R_{thJH} =	0,95	K/W

IGBT thermal model values

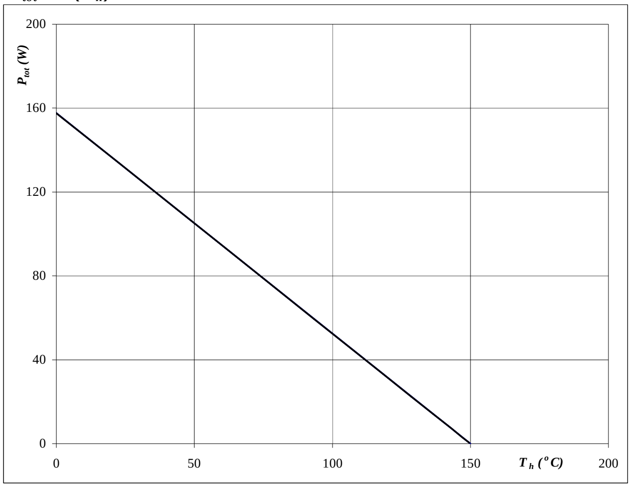
R (K/W)	Tau (s)
0,03	6,6E+00
0,15	9,3E-01
0,55	1,6E-01
0,14	2,5E-02
0,04	2,6E-03
0,03	3,4E-04

Boost and Buck

Figure 19 MOSFET

Power dissipation as a function of heatsink temperature

$P_{tot} = f(T_h)$



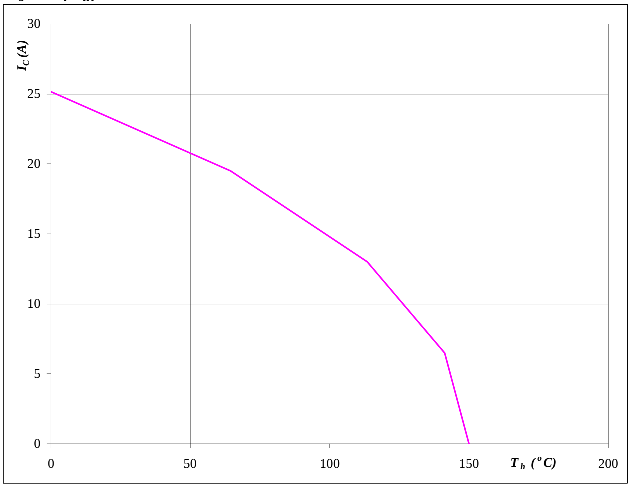
At

T_j = 150 °C

Figure 20 MOSFET

Collector current as a function of heatsink temperature

$I_C = f(T_h)$



At

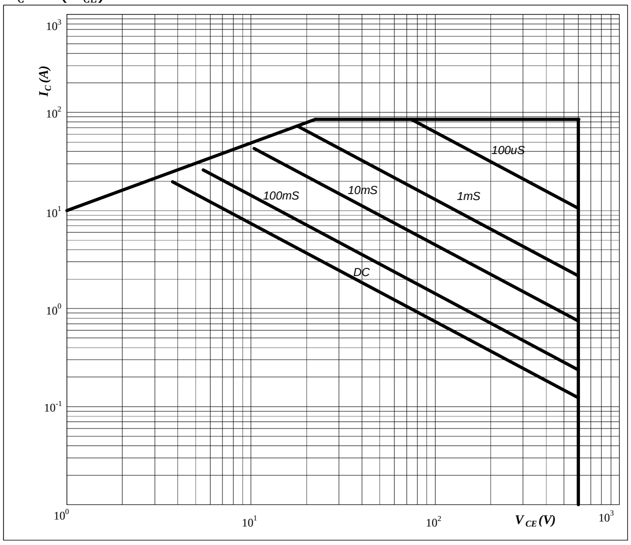
T_j = 150 °C

V_{GE} = 15 V

Figure 21 MOSFET

Safe operating area as a function of collector-emitter voltage

$I_C = f(V_{CE})$



At

D = single pulse

T_h = 80 ºC

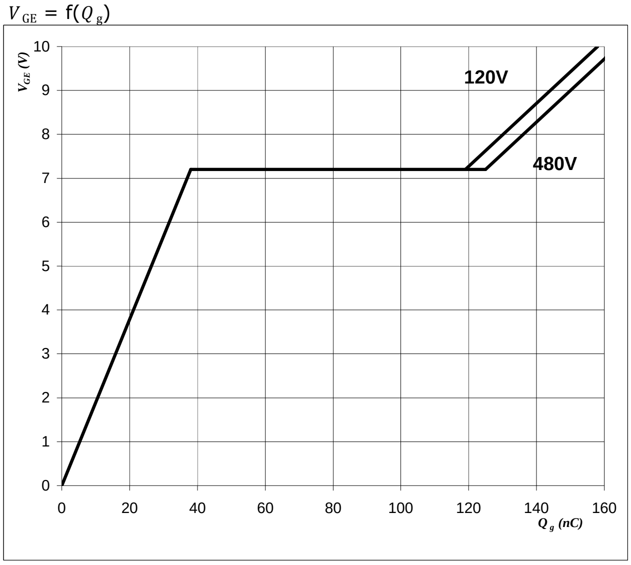
V_{GE} = 15 V

T_j = T_{jmax} ºC

Figure 22 MOSFET

Gate voltage vs Gate charge

$V_{GE} = f(Q_g)$



At

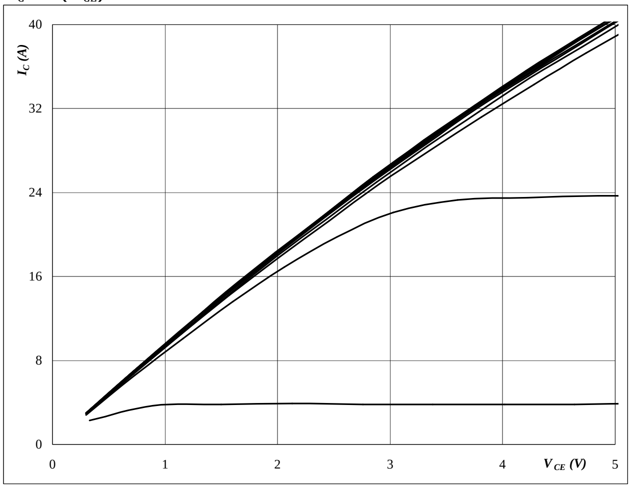
I_D = 47 A

Boost and Buck

Figure 1 IGBT

Typical output characteristics

$I_C = f(V_{CE})$



At

t_p = 250 μs

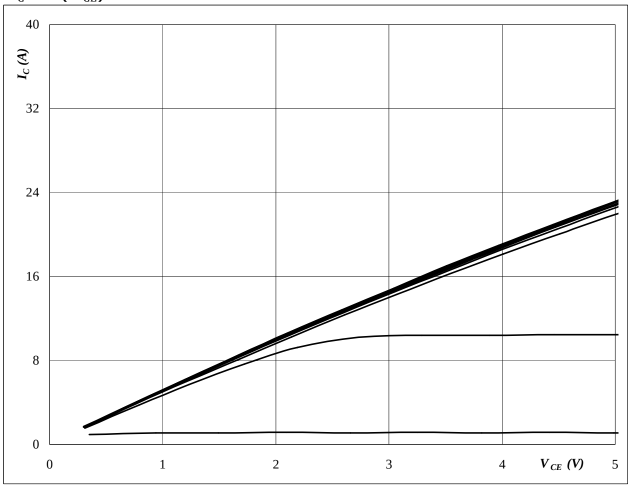
T_j = 25 °C

V_{GE} from 6 V to 16 V in steps of 1 V

Figure 2 IGBT

Typical output characteristics

$I_C = f(V_{CE})$



At

t_p = 250 μs

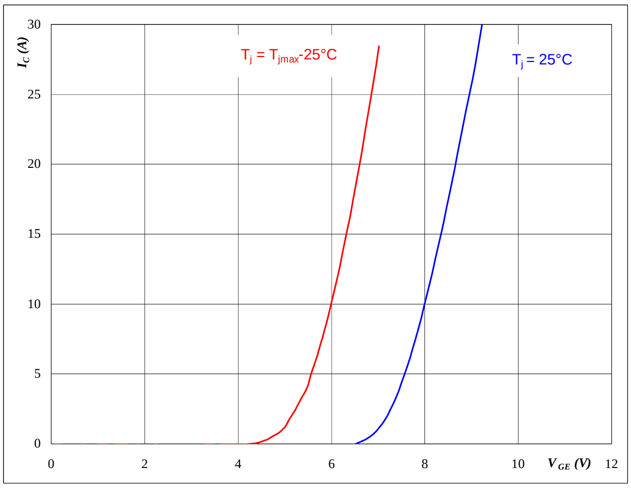
T_j = 125 °C

V_{GE} from 5 V to 15 V in steps of 1 V

Figure 3 IGBT

Typical transfer characteristics

$I_C = f(V_{GE})$



At

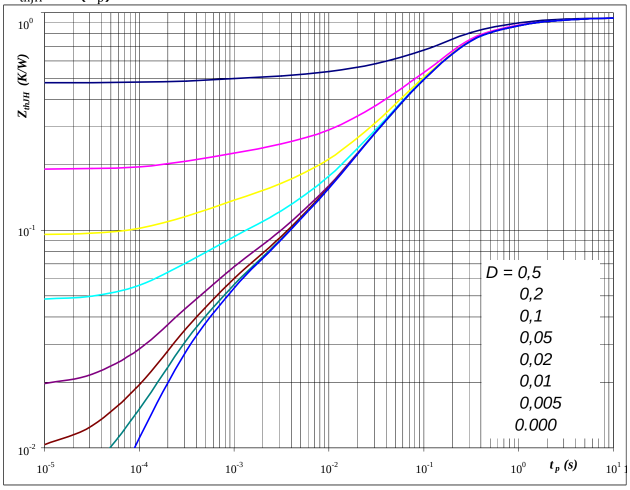
t_p = 250 μs

V_{CE} = 10 V

Figure 4 IGBT

IGBT transient thermal impedance as a function of pulse width

$Z_{thJH} = f(t_p)$



At

$D = t_p / T$

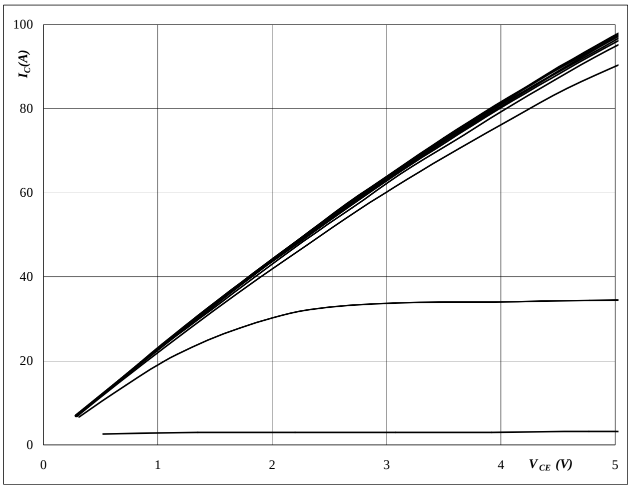
R_{thJH} = 0,95 K/W

Input Boost

Figure 1 BOOST MOSFET

Typical output characteristics

$I_D = f(V_{DS})$



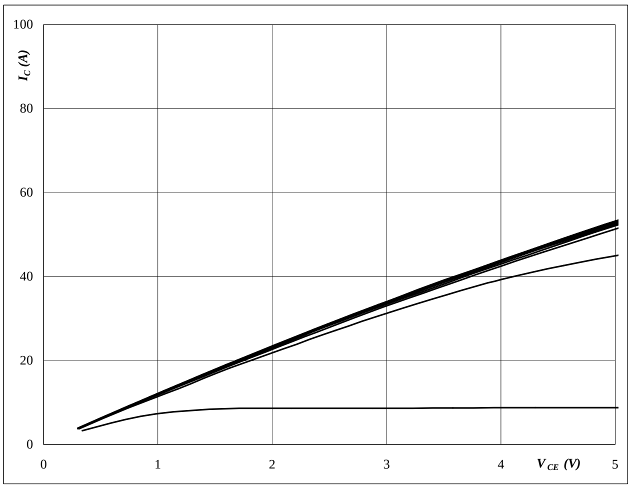
At

t_p =	250	µs
T_j =	25	°C
V_{GS} from	4 V to 14 V in steps of 1 V	

Figure 2 BOOST FWD

Typical output characteristics

$I_D = f(V_{DS})$



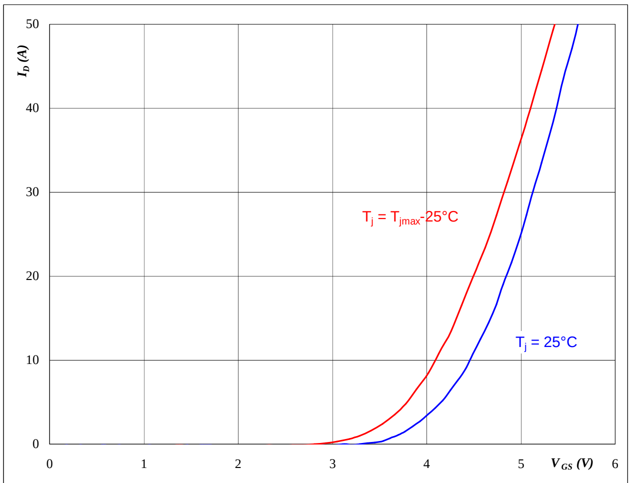
At

t_p =	250	µs
T_j =	126	°C
V_{GS} from	4 V to 14 V in steps of 1 V	

Figure 2 BOOST MOSFET

Typical transfer characteristics

$I_D = f(V_{DS})$



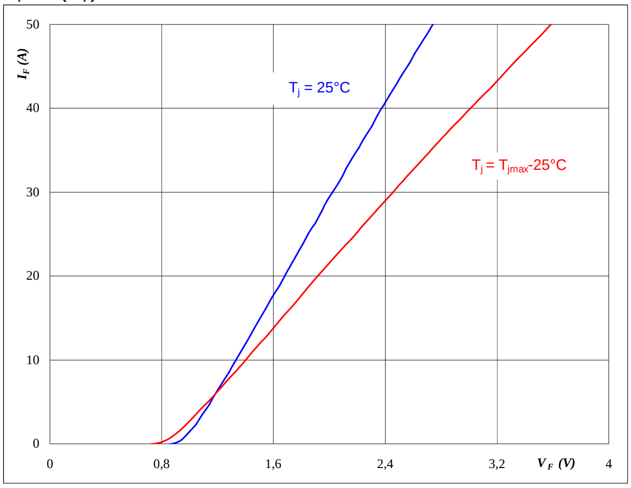
At

t_p =	250	µs
V_{DS} =	10	V

Figure 3 BOOST FWD

Typical FWD forward current as a function of forward voltage

$I_F = f(V_F)$



At

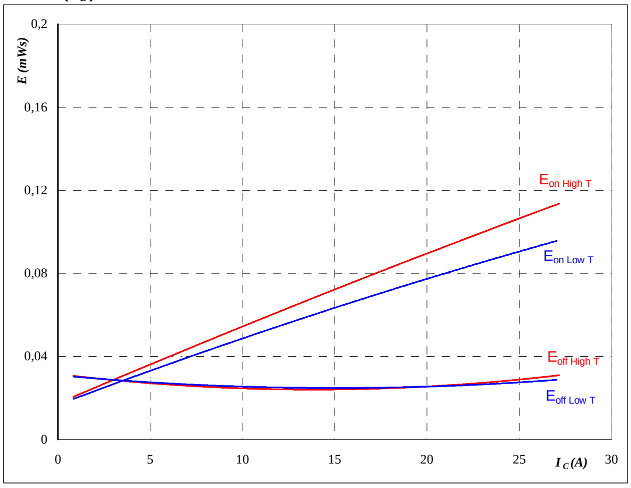
t_p =	250	µs

Input Boost

Figure 4 BOOST MOSFET

Typical switching energy losses as a function of collector current

$E = f(I_D)$



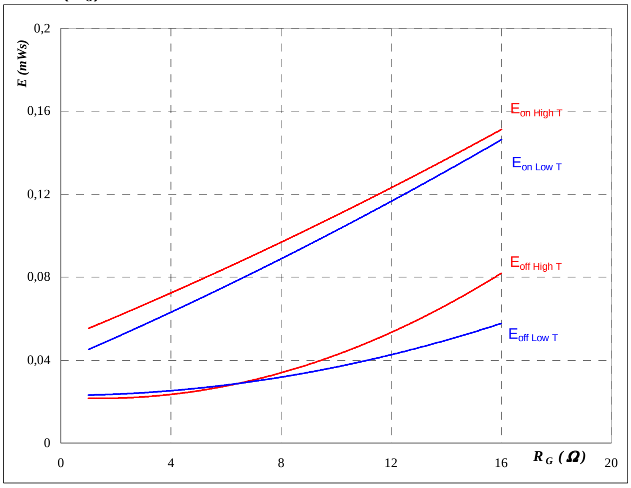
With an inductive load at

T_j =	25/125	°C
V_{DS} =	400	V
V_{GS} =	10	V
R_{gon} =	4	Ω
R_{goff} =	4	Ω

Figure 5 BOOST MOSFET

Typical switching energy losses as a function of gate resistor

$E = f(R_G)$



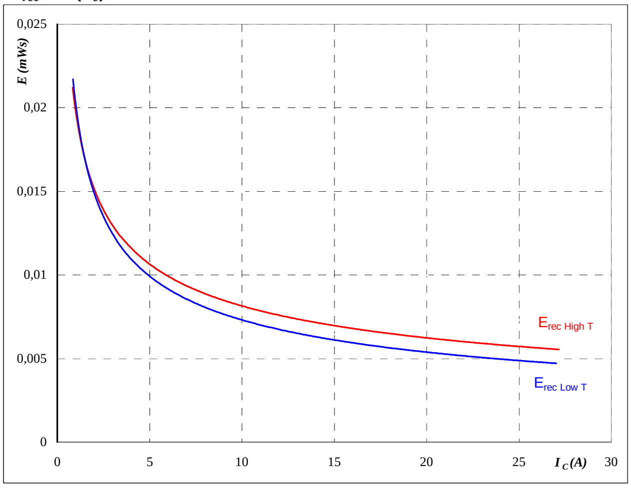
With an inductive load at

T_j =	25/125	°C
V_{DS} =	400	V
V_{GS} =	10	V
I_D =	15	A

Figure 6 BOOST MOSFET

Typical reverse recovery energy loss as a function of collector (drain) current

$E_{rec} = f(I_c)$



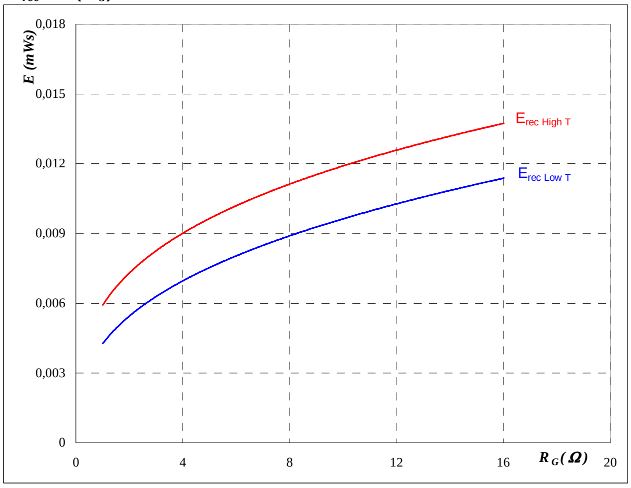
With an inductive load at

T_j =	25/125	°C
V_{DS} =	400	V
V_{GS} =	10	V
R_{gon} =	4	Ω
R_{goff} =	4	Ω

Figure 7 BOOST MOSFET

Typical reverse recovery energy loss as a function of gate resistor

$E_{rec} = f(R_G)$



With an inductive load at

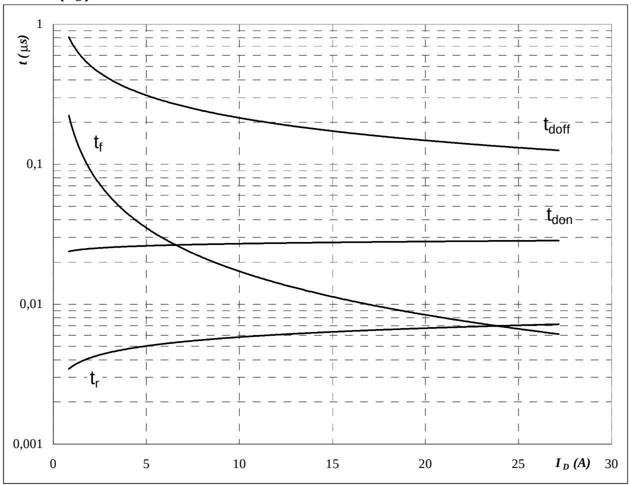
T_j =	25/125	°C
V_{DS} =	400	V
V_{GS} =	10	V
I_D =	15	A

Input Boost

Figure 8 BOOST MOSFET

Typical switching times as a function of collector current

$t = f(I_D)$



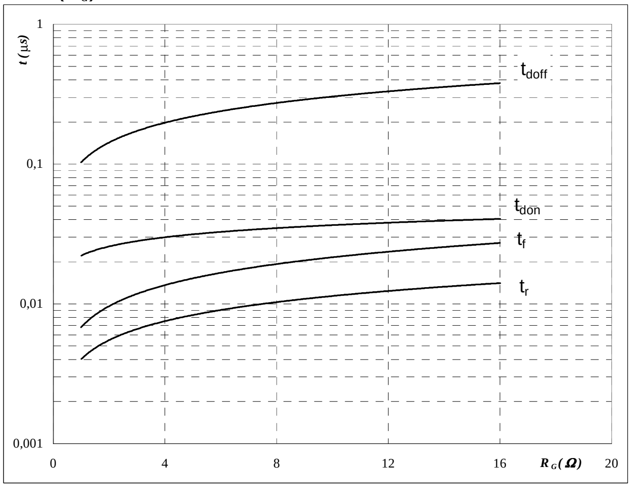
With an inductive load at

T_j =	125	°C
V_{DS} =	400	V
V_{GS} =	10	V
R_{gon} =	4	Ω
R_{goff} =	4	Ω

Figure 9 BOOST MOSFET

Typical switching times as a function of gate resistor

$t = f(R_G)$



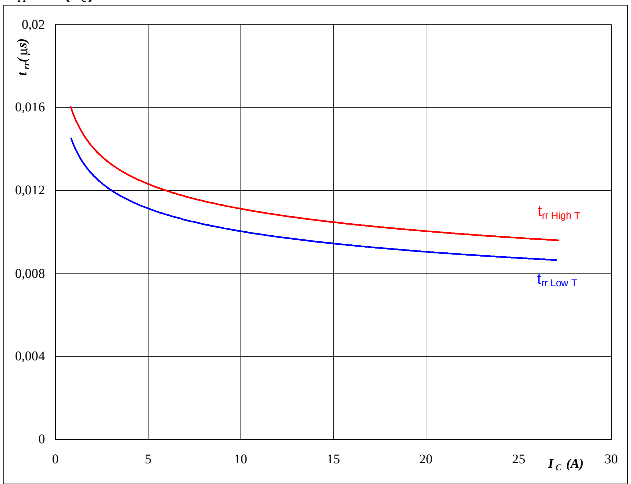
With an inductive load at

T_j =	125	°C
V_{DS} =	400	V
V_{GS} =	10	V
I_C =	15	A

Figure 10 BOOST FWD

Typical reverse recovery time as a function of collector current

$t_{rr} = f(I_c)$



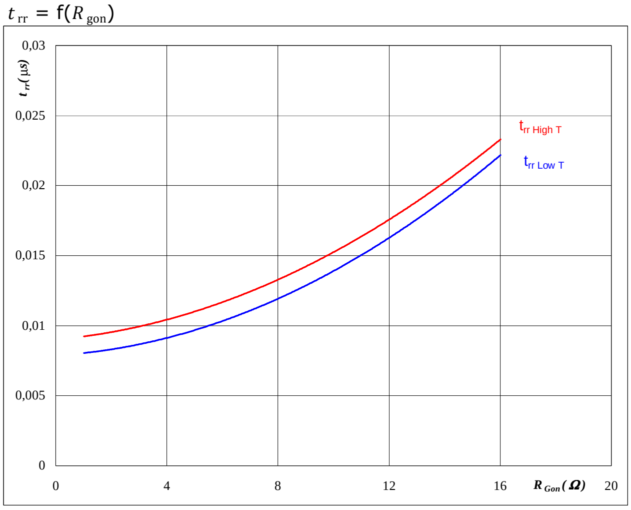
At

T_j =	25/125	°C
V_{CE} =	400	V
V_{GE} =	10	V
R_{gon} =	4	Ω

Figure 11 BOOST FWD

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

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



At

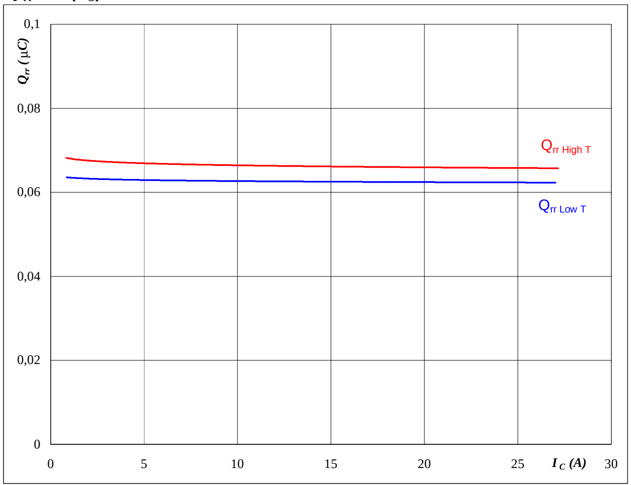
T_j =	25/125	°C
V_R =	400	V
I_F =	15	A
V_{GS} =	10	V

Input Boost

Figure 12 BOOST FWD

Typical reverse recovery charge as a function of collector current

$Q_{rr} = f(I_C)$



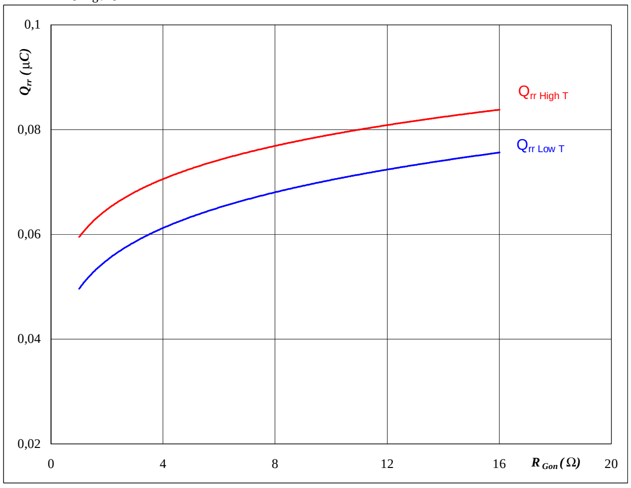
At

T_j =	25/125	°C
V_{CE} =	400	V
V_{GE} =	10	V
R_{gon} =	4	Ω

Figure 13 BOOST FWD

Typical reverse recovery charge as a function of MOSFET turn on gate resistor

$Q_{rr} = f(R_{gon})$



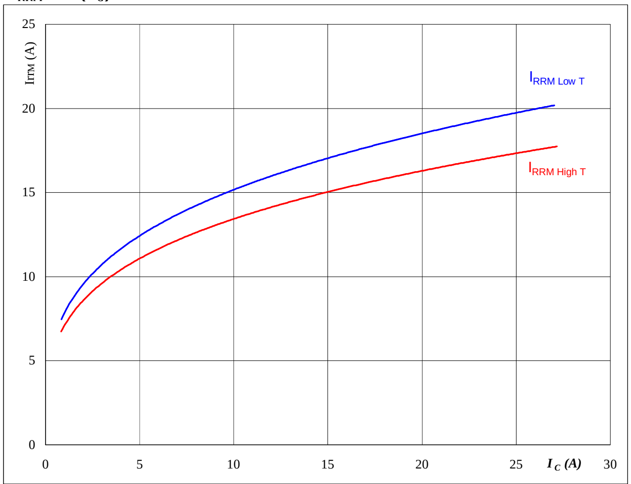
At

T_j =	25/125	°C
V_R =	400	V
I_F =	15	A
V_{GS} =	10	V

Figure 14 BOOST FWD

Typical reverse recovery current as a function of collector current

$I_{RRM} = f(I_C)$



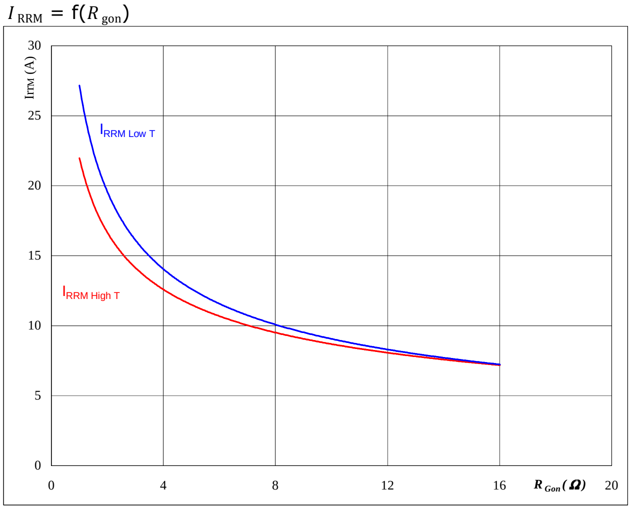
At

T_j =	25/125	°C
V_{CE} =	400	V
V_{GE} =	10	V
R_{gon} =	4	Ω

Figure 15 BOOST FWD

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

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



At

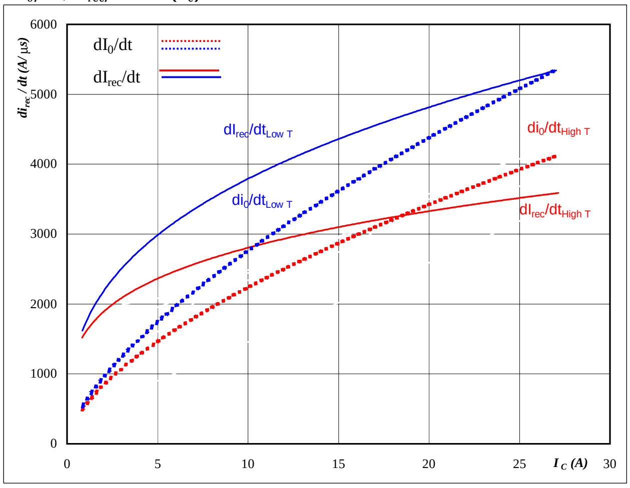
T_j =	25/125	°C
V_R =	400	V
I_F =	15	A
V_{GS} =	10	V

Input Boost

Figure 16 BOOST FWD

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

$dI_0/dt, dI_{rec}/dt = f(I_C)$



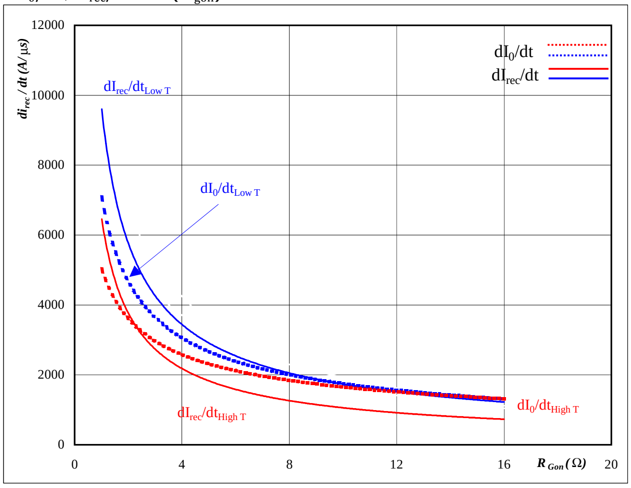
At

T_j =	25/125	°C
V_{CE} =	400	V
V_{GE} =	10	V
R_{gon} =	4	Ω

Figure 17 BOOST FWD

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

$dI_0/dt, dI_{rec}/dt = f(R_{gon})$



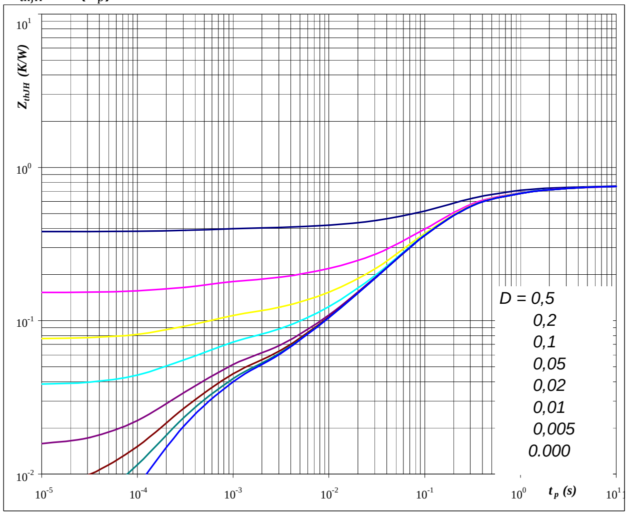
At

T_j =	25/125	°C
V_R =	400	V
I_F =	15	A
V_{GS} =	10	V

Figure 18 BOOST MOSFET

IGBT/MOSFET transient thermal impedance as a function of pulse width

$Z_{thJH} = f(t_p)$



At

D =	t_p / T	
R_{thJH} =	0,76	K/W

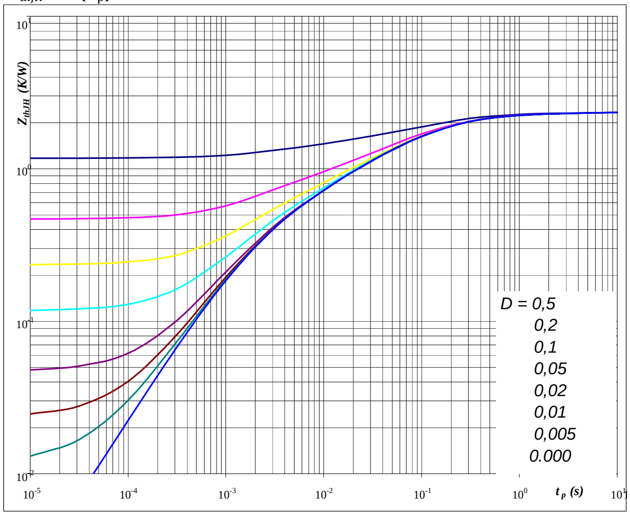
IGBT thermal model values

R (K/W)	Tau (s)
0,03247	9,971
0,1223	1,22
0,4264	0,1797
0,1173	0,04698
0,03103	0,005891
0,03298	0,000404

Figure 19 BOOST FWD

FWD transient thermal impedance as a function of pulse width

$Z_{thJH} = f(t_p)$



At

D =	t_p / T	
R_{thJH} =	2,34	K/W

FWD thermal model values

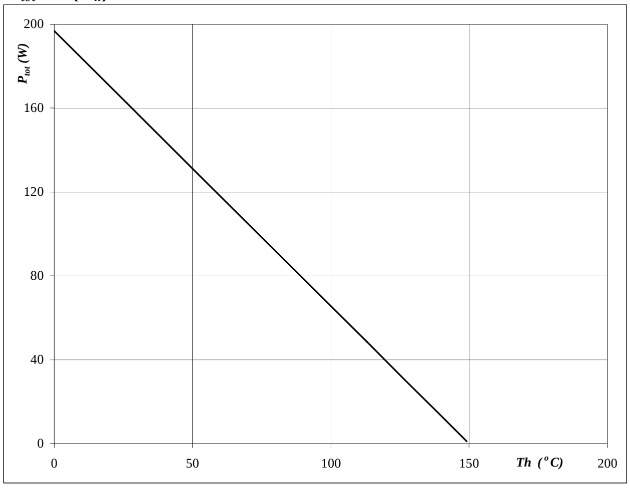
R (K/W)	Tau (s)
0,1024	2,885
0,495	0,3437
0,9886	0,07039
0,4865	0,01004
0,2673	0,001614

Input Boost

Figure 20 BOOST MOSFET

Power dissipation as a function of heatsink temperature

$P_{tot} = f(T_h)$



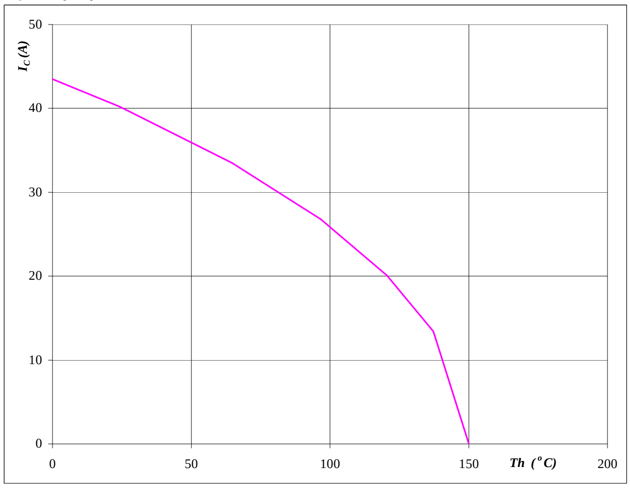
At

T_j = 150 ºC

Figure 21 BOOST MOSFET

Collector/Drain current as a function of heatsink temperature

$I_C = f(T_h)$



At

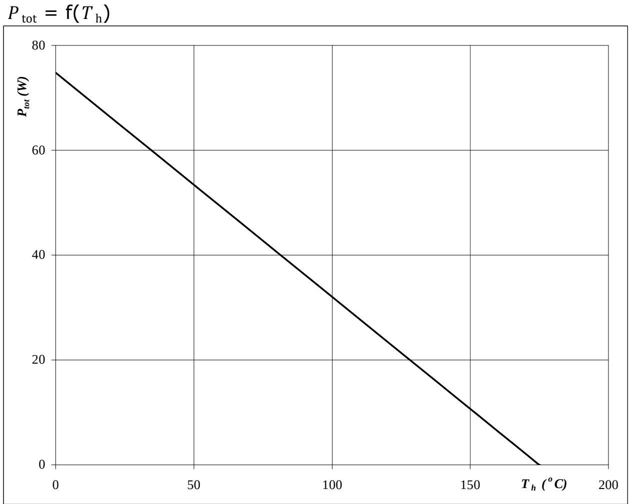
T_j = 150 ºC

V_{GS} = 10 V

Figure 22 BOOST FWD

Power dissipation as a function of heatsink temperature

$P_{tot} = f(T_h)$



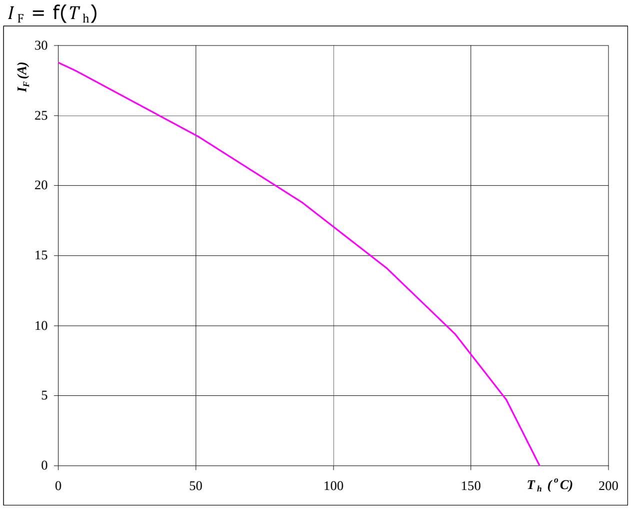
At

T_j = 175 ºC

Figure 23 BOOST FWD

Forward current as a function of heatsink temperature

$I_F = f(T_h)$



At

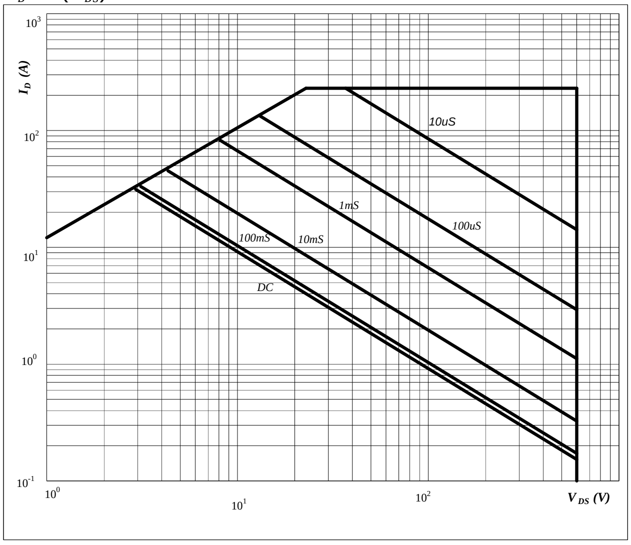
T_j = 175 ºC

Input Boost

Figure 24	BOOST MOSFET

Safe operating area as a function of drain-source voltage

$I_D = f(V_{DS})$



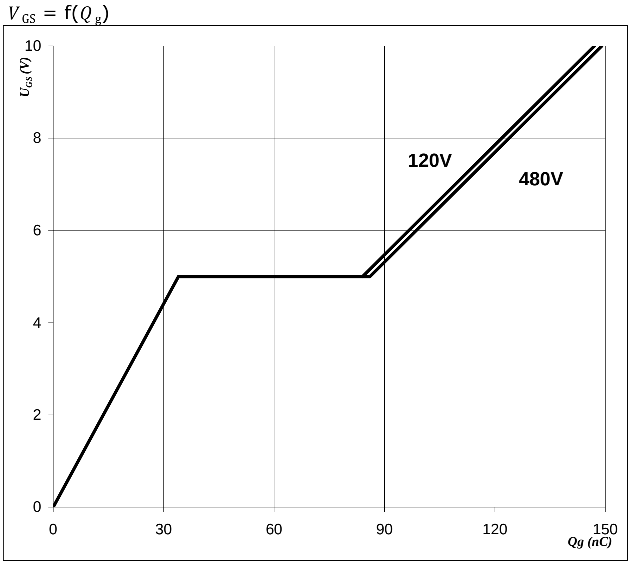
At

D =	single pulse	
T_h =	80	ºC
V_{GS} =	10	V
T_j =	T_{jmax}	ºC

Figure 25	BOOST MOSFET

Gate voltage vs Gate charge

$V_{GS} = f(Q_g)$



At

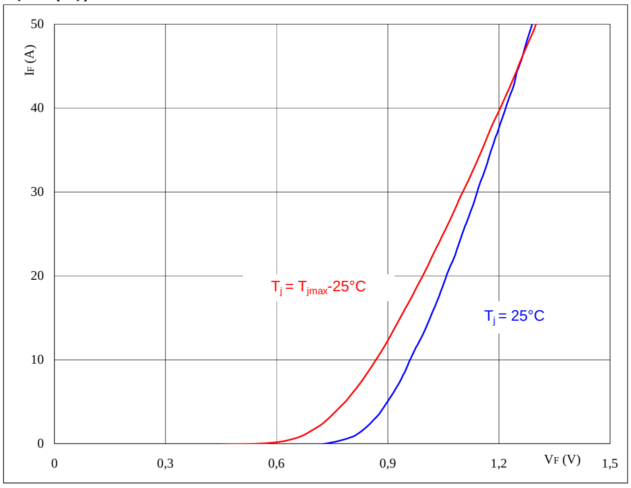
I_D =	44	A

Bypass FWD

Figure 1 Bypass FWD

Typical FWD forward current as a function of forward voltage

$I_F = f(V_F)$



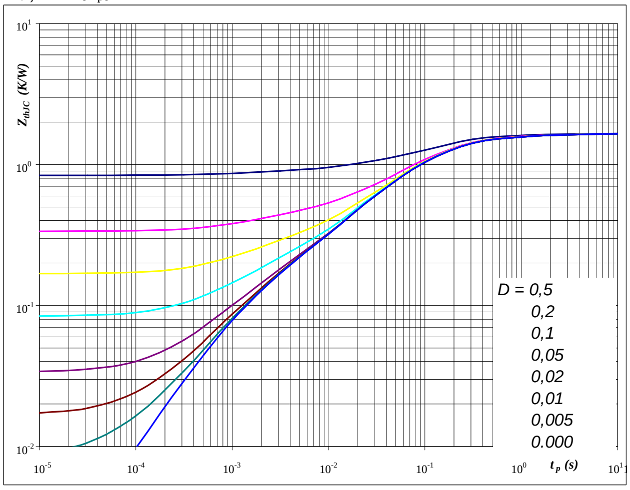
At

t_p = 250 µs

Figure 2 Bypass FWD

FWD transient thermal impedance as a function of pulse width

$Z_{thJH} = f(t_p)$



At

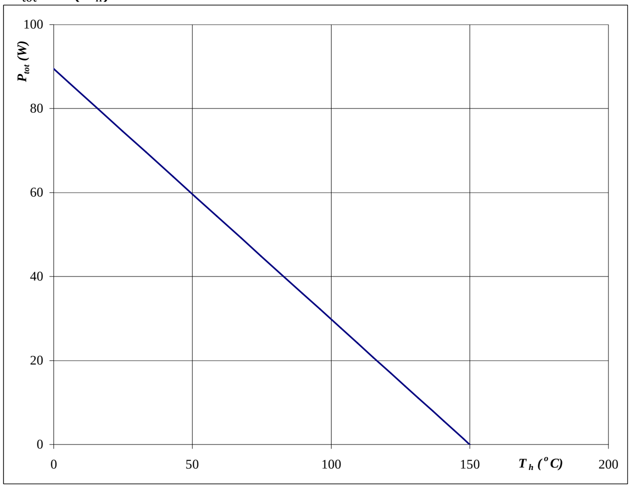
$D = t_p / T$

R_{thJH} = 1,677 K/W

Figure 3 Bypass FWD

Power dissipation as a function of heatsink temperature

$P_{tot} = f(T_h)$



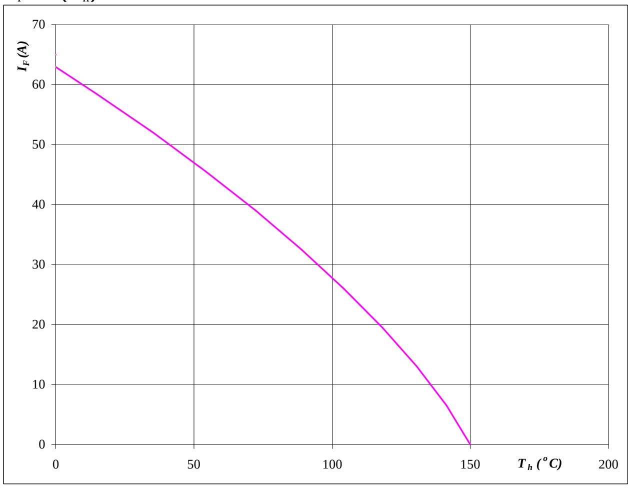
At

T_j = 150 ºC

Figure 4 Bypass FWD

Forward current as a function of heatsink temperature

$I_F = f(T_h)$



At

T_j = 150 ºC

Thermistor

Figure 1 Thermistor

Typical NTC characteristic as a function of temperature

$R_T = f(T)$

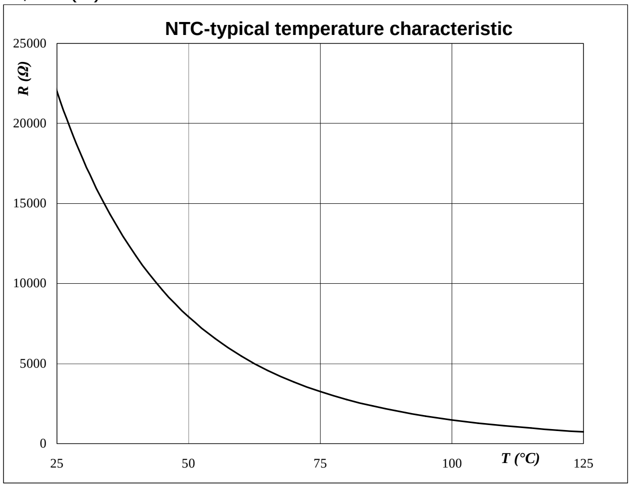


Figure 2 Thermistor

Typical NTC resistance values

$$R(T) = R_{25} \cdot e^{\left(B_{25/100} \cdot \left(\frac{1}{T} - \frac{1}{T_{25}}\right)\right)} \quad [\Omega]$$

T [°C]	R_{nom} [Ω]	R_{min} [Ω]	R_{max} [Ω]	△R/R [±%]
-55	2089434,5	1506495,4	2672373,6	27,9
0	71804,2	59724,4	83884	16,8
10	43780,4	37094,4	50466,5	15,3
20	27484,6	23684,6	31284,7	13,8
25	22000	19109,3	24890,7	13,1
30	17723,3	15512,2	19934,4	12,5
60	5467,9	4980,6	5955,1	8,9
70	3848,6	3546	4151,1	7,9
80	2757,7	2568,2	2947,1	6,9
90	2008,9	1889,7	2128,2	5,9
100	**1486,1**	**1411,8**	**1560,4**	**5**
150	400,2	364,8	435,7	8,8

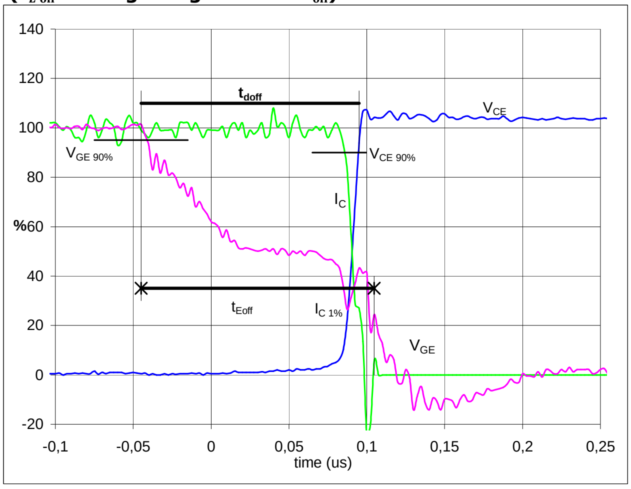
Switching Definitions BUCK MOSFET

General conditions

T_j	=	124 °C
R_{gon}	=	16 Ω
R_{goff}	=	4 Ω

Figure 1 BUCK MOSFET

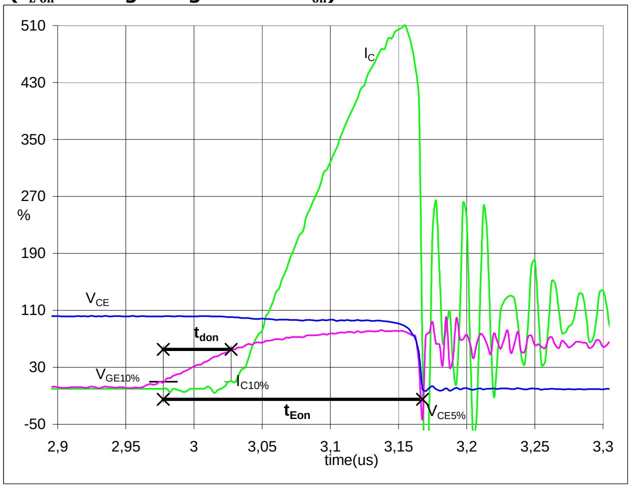
Turn-off Switching Waveforms & definition of t_{doff}, t_{Eoff}
($t_{E\,off}$ = integrating time for E_{off})



V_{GE} (0%) =	0	V
V_{GE} (100%) =	10	V
V_C (100%) =	400	V
I_C (100%) =	15	A
t_{doff} =	0,13	μs
$t_{E\,off}$ =	0,15	μs

Figure 2 BUCK MOSFET

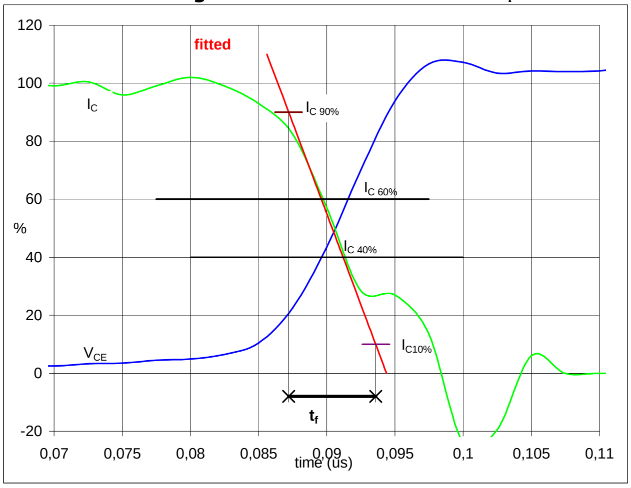
Turn-on Switching Waveforms & definition of t_{don}, t_{Eon}
($t_{E\,on}$ = integrating time for E_{on})



V_{GE} (0%) =	0	V
V_{GE} (100%) =	10	V
V_C (100%) =	400	V
I_C (100%) =	15	A
t_{don} =	0,06	μs
$t_{E\,on}$ =	0,19	μs

Figure 3 BUCK MOSFET

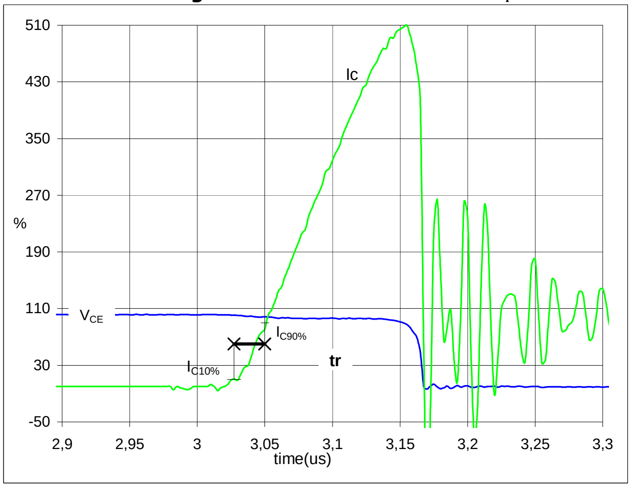
Turn-off Switching Waveforms & definition of t_f



V_C (100%) =	400	V
I_C (100%) =	15	A
t_f =	0,01	μs

Figure 4 BUCK MOSFET

Turn-on Switching Waveforms & definition of t_r

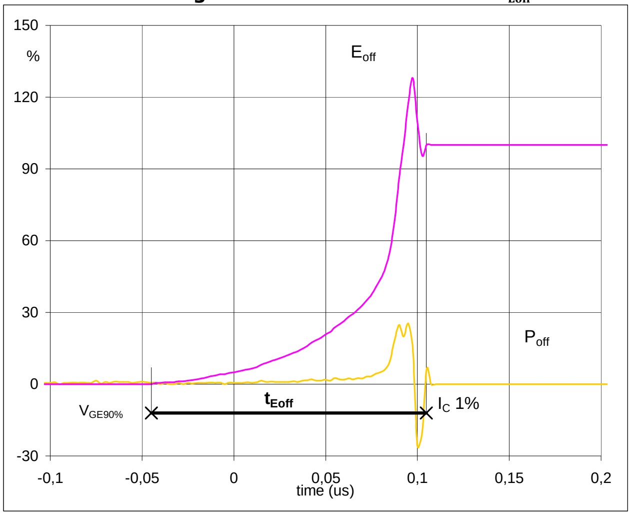


V_C (100%) =	400	V
I_C (100%) =	15	A
t_r =	0,02	μs

Switching Definitions BUCK MOSFET

Figure 5 BUCK MOSFET

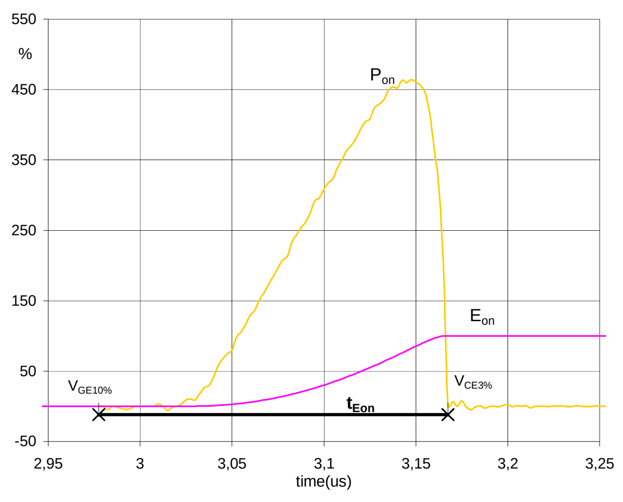
Turn-off Switching Waveforms & definition of t_{Eoff}



P_{off} (100%) =	6,13	kW
E_{off} (100%) =	0,02	mJ
$t_{E\,off}$ =	0,15	μs

Figure 6 BUCK MOSFET

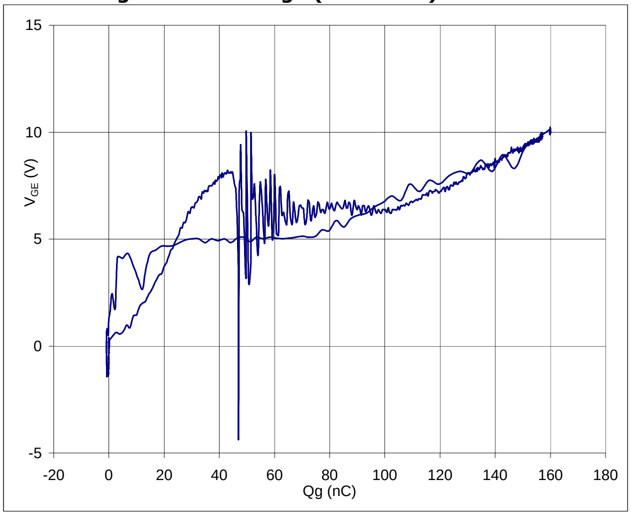
Turn-on Switching Waveforms & definition of t_{Eon}



P_{on} (100%) =	6,13	kW
E_{on} (100%) =	2,27	mJ
$t_{E\,on}$ =	0,19	μs

Figure 7 Output inverter FWD

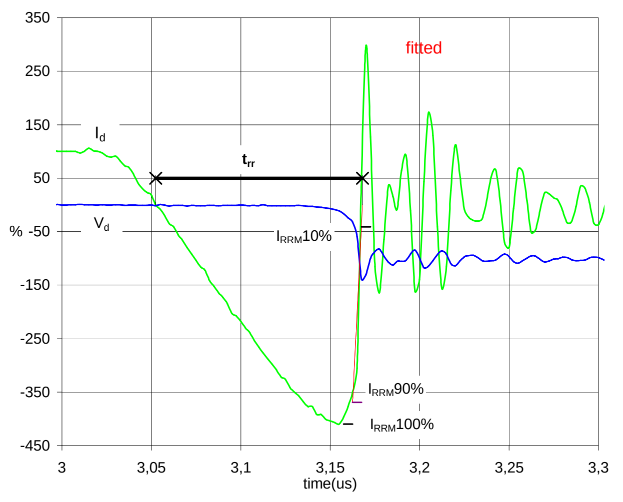
Gate voltage vs Gate charge (measured)



$V_{GE\,off}$ =	0	V
$V_{GE\,on}$ =	10	V
V_C (100%) =	400	V
I_C (100%) =	15	A
Q_g =	159,93	nC

Figure 8 BUCK MOSFET

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

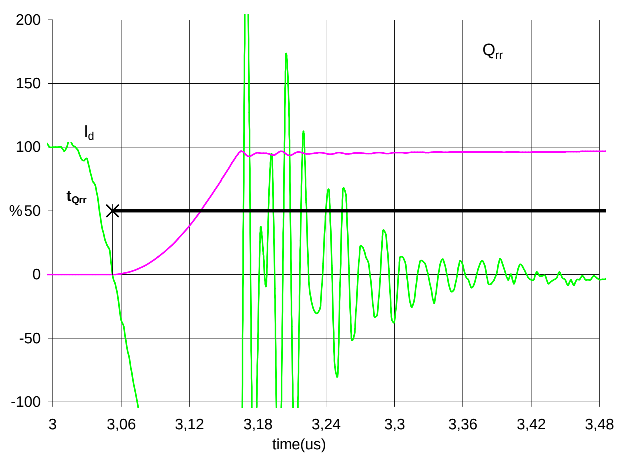


V_d (100%) =	400	V
I_d (100%) =	15	A
I_{RRM} (100%) =	-63	A
t_{rr} =	0,11	μs

Switching Definitions BUCK MOSFET

Figure 9 Output inverter FWD

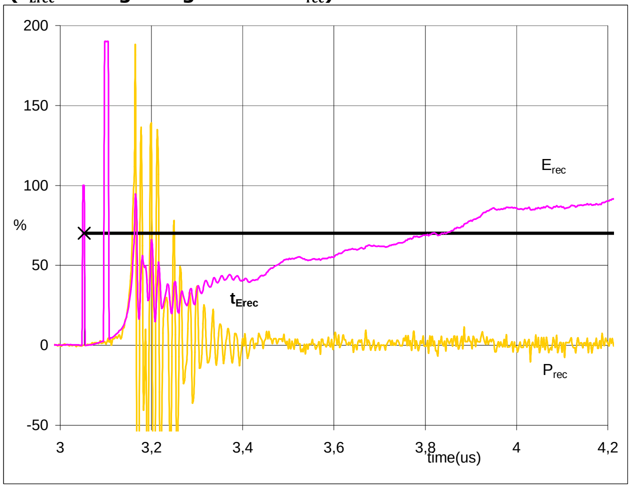
Turn-on Switching Waveforms & definition of t_{Qrr}
($t_{Q\,rr}$ = integrating time for Q_{rr})



I_d (100%) =	15	A
Q_{rr} (100%) =	4,31	µC
$t_{Q\,rr}$ =	######	µs

Figure 10 Output inverter FWD

Turn-on Switching Waveforms & definition of t_{Erec}
(t_{Erec}= integrating time for E_{rec})

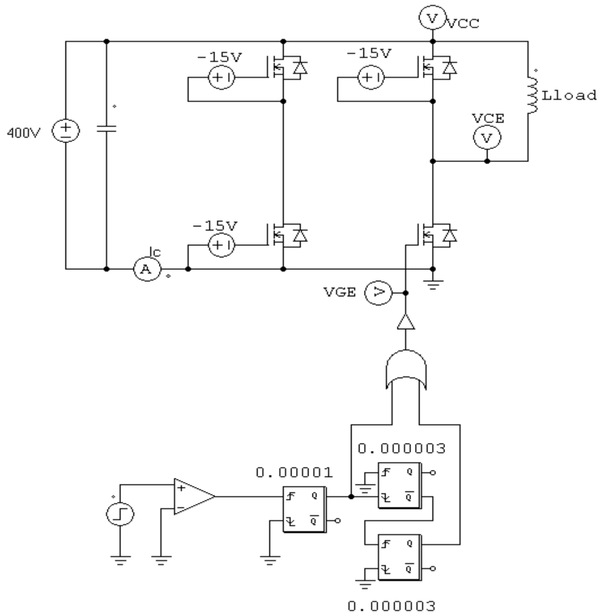


P_{rec} (100%) =	6,13	kW
E_{rec} (100%) =	0,17	mJ
$t_{E\,rec}$ =	######	µs

Measurement circuits

Figure 11

BUCK stage switching measurement circuit



Ordering Code and Marking - Outline - Pinout

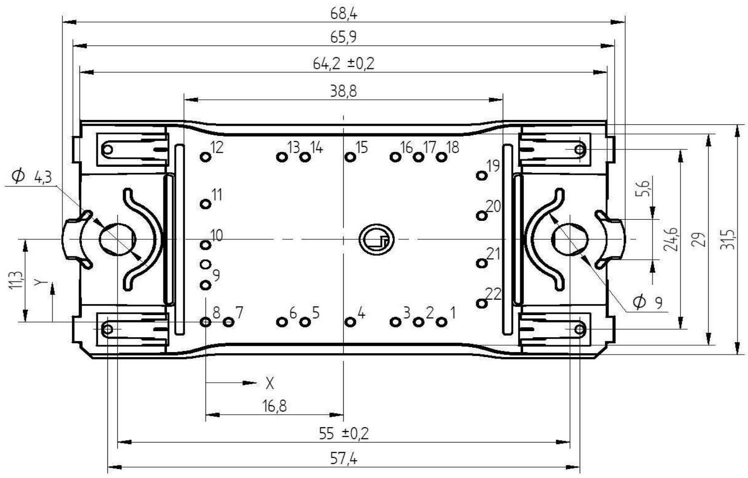
Ordering Code & Marking

Version	Ordering Code	in DataMatrix as	in packaging barcode as
without thermal paste 12mm housing	10-FZ06BIA083FI-P896E	P896E	P896E
with thermal paste 12mm housing	10-FZ06BIA083FI-P896E-/3/	P896E	P896E-/3/

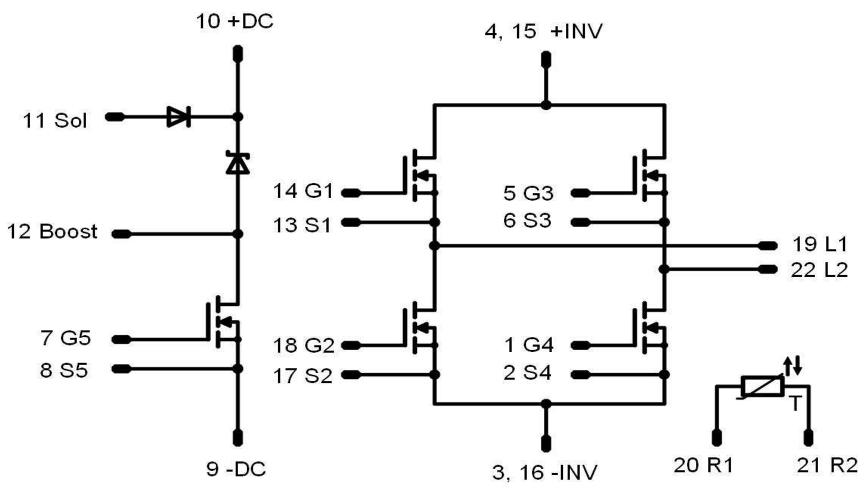
Outline

Pin table

Pin	X	Y
1	28,7	0
2	25,9	0
3	23,1	0
4	17,6	0
5	12,1	0
6	9,3	0
7	2,8	0
8	0	0
9	0	5,05
10	0	10,55
11	0	16,15
12	0	22,6
13	9,3	22,6
14	12,1	22,6
15	17,6	22,6
16	23,1	22,6
17	25,9	22,6
18	28,7	22,6
19	33,6	20,05
20	33,6	14,55
21	33,6	8,05
22	33,6	2,55



Pinout



DISCLAIMER

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As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, or (c) whose failure to perform when properly used in accordance with instructions for use provided in labelling can be reasonably expected to result in significant injury to the user.
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.