10-PY07NIB150SG-M136F38Y
datasheet

Vincotech

flow NPC 1	650 V / 150 A

Features

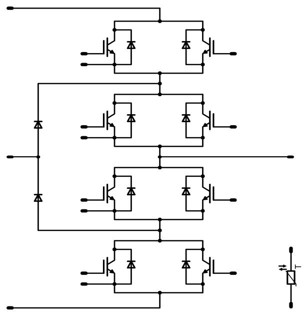
- Neutral-point-Clamped inverter
- Compact *flow* 1 housing
- Low Inductance Layout

***flow* 1 12mm housing**

Target Applications

- UPS
- Motor Drive
- Solar inverters

Schematic



Types

- 10-PY07NIB150SG-M136F38Y

Maximum Ratings

T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Condition		Value	Unit
Buck IGBT					
Collector-emitter breakdown voltage	V_{CE}			650	V
DC collector current	I_C	$T_j = T_{jmax}$	T_s = 80 °C	128	A
Repetitive peak collector current	I_{CRM}	t_p limited by T_{jmax}		450	A
Power dissipation	P_{tot}	$T_j = T_{jmax}$	T_s = 80 °C	279	W
Gate-emitter peak voltage	V_{GE}			±20	V
Short circuit ratings	t_{SC} V_{CC}	T_j ≤ 150 °C V_{GE} = 15 V		5 400	μs V
Maximum Junction Temperature	T_{jmax}			175	°C
Buck Diode					
Peak Repetitive Reverse Voltage	V_{RRM}			650	V
DC forward current	I_F	$T_j = T_{jmax}$	T_s = 80 °C	125	A
Diode surge non repetitive forward current	I_{FSM}	t_p = 10 ms, sine half wave	T_j=100°C	1280	A
Power dissipation	P_{tot}	$T_j = T_{jmax}$	T_s = 80 °C	241	W
Maximum Junction Temperature	T_{jmax}			175	°C

Maximum Ratings

T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Condition		Value	Unit
Boost IGBT					
Collector-emitter breakdown voltage	V_{CE}			600	V
DC collector current	I_C	$T_j = T_{jmax}$	T_s = 80 °C	173	A
Repetitive peak collector current	I_{CRM}	t_p limited by T_{jmax}		450	A
Power dissipation	P_{tot}	$T_j = T_{jmax}$	T_s = 80 °C	324	W
Gate-emitter peak voltage	V_{GE}			±20	V
Short circuit ratings	t_{SC} V_{CC}	T_j ≤ 150 °C V_{GE} = 15 V		6 360	μs V
Maximum Junction Temperature	T_{jmax}			175	°C
Boost Inverse Diode					
Peak Repetitive Reverse Voltage	V_{RRM}			600	V
DC forward current	I_F	$T_j = T_{jmax}$	T_s = 80 °C	124	A
Repetitive peak forward current	I_{FRM}	t_p limited by T_{jmax}		200	A
Power dissipation	P_{tot}	$T_j = T_{jmax}$	T_s = 80 °C	204	W
Maximum Junction Temperature	T_{jmax}			175	°C
Boost Diode					
Peak Repetitive Reverse Voltage	V_{RRM}			650	V
DC forward current	I_F	$T_j = T_{jmax}$	T_s = 80 °C	120	A
Repetitive peak forward current	I_{FRM}	t_p limited by T_{jmax}		200	A
Power dissipation	P_{tot}	$T_j = T_{jmax}$	T_s = 80 °C	203	W
Maximum Junction Temperature	T_{jmax}			175	°C
Thermal Properties					
Storage temperature	T_{stg}			-40…+125	°C
Operation temperature under switching condition	T_{op}			-40…+(T_{jmax} - 25)	°C
Isolation Properties					
Isolation voltage	V_{is}	t = 2 s	DC Test Voltage	4000	V
Creepage distance				min 12,7	mm
Clearance				min 12,7	mm
Comparative Tracking Index	CTI			>200	

Characteristic Values

Parameter	Symbol	Conditions	V_{GE} [V] V_{GS} [V]	V_r [V] V_{CE} [V] V_{DS} [V]	I_C [A] I_F [A] I_D [A]	T_j [°C]	Value Min	Typ	Max	Unit
Buck IGBT										
Gate emitter threshold voltage	$V_{GE(th)}$	$V_{CE} = V_{GE}$			0,0024	25	4,2	5,1	5,6	V
Collector-emitter saturation voltage	V_{CEsat}		15		150	25 150	1,38	1,94 2,26	2,22	V
Collector-emitter cut-off current incl. Diode	I_{CES}		0	650		25			0,0076	mA
Gate-emitter leakage current	I_{GES}		20	0		25			300	nA
Integrated Gate resistor	R_{gint}							none		Ω
Turn-on delay time	$t_{d(on)}$	R_{goff} = 4 Ω R_{gon} = 4 Ω	±15	350	150	25 150		147 149		ns
Rise time	t_r					25 150		30 34		
Turn-off delay time	$t_{d(off)}$					25 150		197 219		
Fall time	t_f					25 150		18 27		
Turn-on energy loss	E_{on}					25 150		1,53 2,45		mWs
Turn-off energy loss	E_{off}					25 150		1,69 2,68		
Input capacitance	C_{ies}	f = 1 MHz	0	25		25		9240		pF
Output capacitance	C_{oss}							480		
Reverse transfer capacitance	C_{rss}							274		
Gate charge	Q_G		15	480	150	25		940		nC
Thermal resistance junction to sink	$R_{th(j-s)}$	phase-change material λ = 3,4 W/mK						0,34		K/W
Buck Diode										
Diode forward voltage	V_F				160	25 150		1,67 2,01	1,7	V
Reverse leakage current	I_r			650		25			160	µA
Peak reverse recovery current	I_{RRM}	R_{gon} = 4 Ω	±15	350	150	25 150		104 157		A
Reverse recovery time	t_{rr}					25 150		59 97		ns
Reverse recovered charge	Q_{rr}					25 150		5 10		µC
Peak rate of fall of recovery current	$(di_{rf}/dt)_{max}$					25 150		6885 3093		A/µs
Reverse recovered energy	E_{rec}					25 150		0,92 2,07		mWs
Thermal resistance junction to sink	$R_{th(j-s)}$	phase-change material λ = 3,4 W/mK						0,39		K/W

Characteristic Values

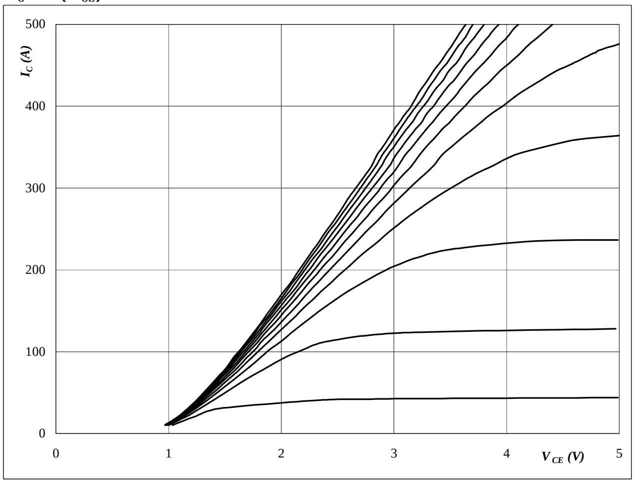
Parameter	Symbol	Conditions					Value			Unit
			V_{GE} [V] V_{GS} [V]	V_r [V] V_{CE} [V] V_{DS} [V]	I_C [A] I_F [A] I_D [A]	T_j [°C]	Min	Typ	Max	
Boost IGBT										
Gate emitter threshold voltage	$V_{GE(th)}$	$V_{CE} = V_{GE}$			0,0024	25	5	5,8	6,5	V
Collector-emitter saturation voltage	V_{CEsat}		15		150	25 150	1,05	1,46 1,65	1,85	V
Collector-emitter cut-off incl diode	I_{CES}		0	600		25			0,0076	mA
Gate-emitter leakage current	I_{GES}		20	0		25			1200	nA
Integrated Gate resistor	R_{gint}					25		none		Ω
Turn-on delay time	$t_{d(on)}$	R_{goff} = 4 Ω R_{gon} = 4 Ω	±15	350	150	25 150		149 151		ns
Rise time	t_r					25 150		31 36		
Turn-off delay time	$t_{d(off)}$					25 150		220 245		
Fall time	t_f					25 150		58 78		
Turn-on energy loss	E_{on}					25 150		1,77 2,38		mWs
Turn-off energy loss	E_{off}					25 150		4,26 5,95		
Input capacitance	C_{ies}	f = 1 MHz	0	25		25		9240		pF
Output capacitance	C_{oss}							576		
Reverse transfer capacitance	C_{rss}							274		
Gate charge	Q_G		15	480	150			940		nC
Thermal resistance junction to sink	$R_{th(j-s)}$	phase-change material λ = 3,4 W/mK						0,29		K/W
Boost Inverse Diode										
Diode forward voltage	V_F				100	25 150	1,20	1,77 1,54	1,90	V
Thermal resistance junction to sink	$R_{th(j-s)}$	phase-change material λ = 3,4 W/mK						0,46		K/W
Boost Diode										
Diode forward voltage	V_F				100	25 150	1,2	1,77 1,57	1,9	V
Reverse leakage current	I_r			650		25			48	µA
Peak reverse recovery current	I_{RRM}	R_{gon} = 4 Ω	±15	350	150	25 150		82 114		A
Reverse recovery time	t_{rr}					25 150		133 290		ns
Reverse recovered charge	Q_{rr}					25 150		6 13		µC
Peak rate of fall of recovery current	$(di_{rf}/dt)_{max}$					25 150		559 676		A/µs
Reverse recovery energy	E_{rec}					25 150		1,65 3,68		mWs
Thermal resistance junction to sink	$R_{th(j-s)}$	phase-change material λ = 3,4 W/mK						0,47		K/W
Thermistor										
Rated resistance	R					25		21511		Ω
Deviation of R_{100}	$\Delta_{R/R}$	R_{100} = 1486 Ω				100	-4,5		+4,5	%
Power dissipation	P					25		210		mW
Power dissipation constant						25		3,5		mW/K
B-value	$B_{(25/50)}$					25		3884		K
B-value	$B_{(25/100)}$	Tol. ±1%				25		3964		K
Vincotech NTC Reference									F	

Buck

figure 1. **IGBT**

Typical output characteristics

$I_C = f(V_{CE})$



At

t_p = 350 µs

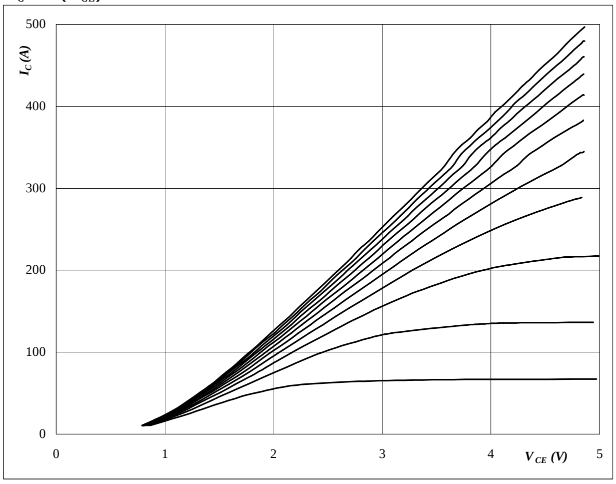
T_j = 25 °C

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

figure 2. **IGBT**

Typical output characteristics

$I_C = f(V_{CE})$



At

t_p = 350 µs

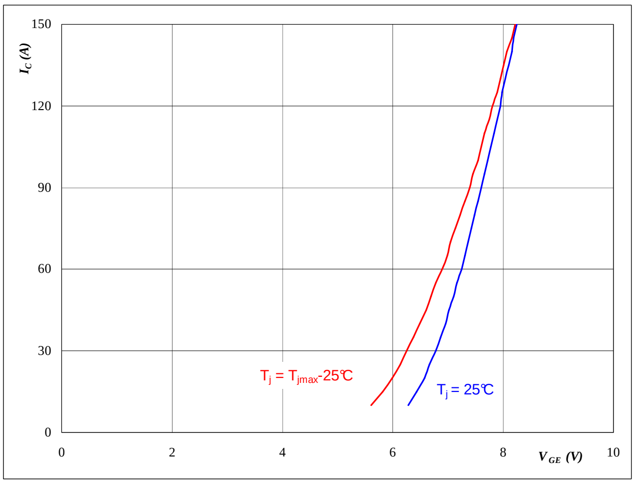
T_j = 150 °C

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

figure 3. **IGBT**

Typical transfer characteristics

$I_C = f(V_{GE})$



At

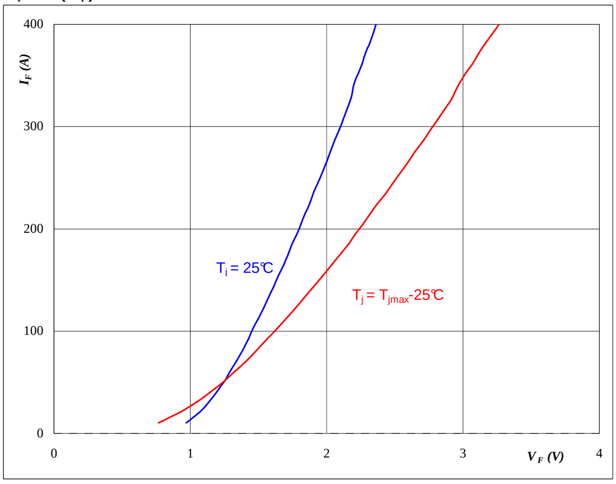
t_p = 350 µs

V_{CE} = 10 V

figure 4. **FWD**

Typical diode forward current as a function of forward voltage

$I_F = f(V_F)$



At

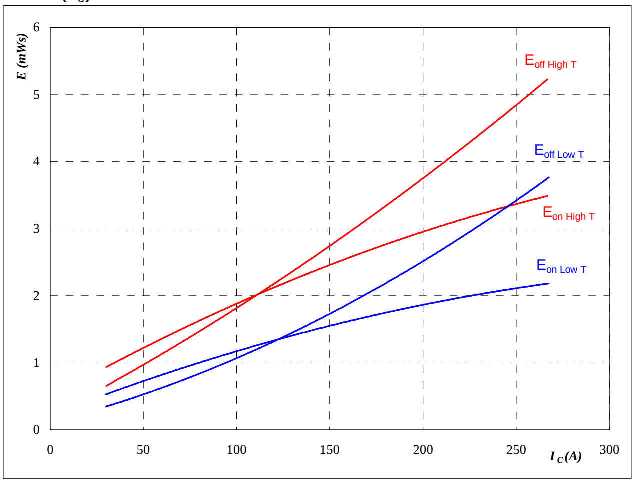
t_p = 350 µs

Buck

figure 5. **IGBT**

Typical switching energy losses
as a function of collector current

$E = f(I_C)$



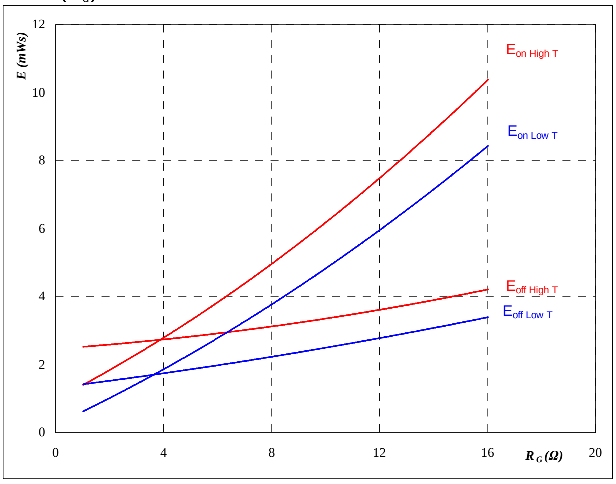
With an inductive load at

T_j =	25/150	°C
V_{CE} =	350	V
V_{GE} =	±15	V
R_{gon} =	4	Ω
R_{goff} =	4	Ω

figure 6. **IGBT**

Typical switching energy losses
as a function of gate resistor

$E = f(R_G)$



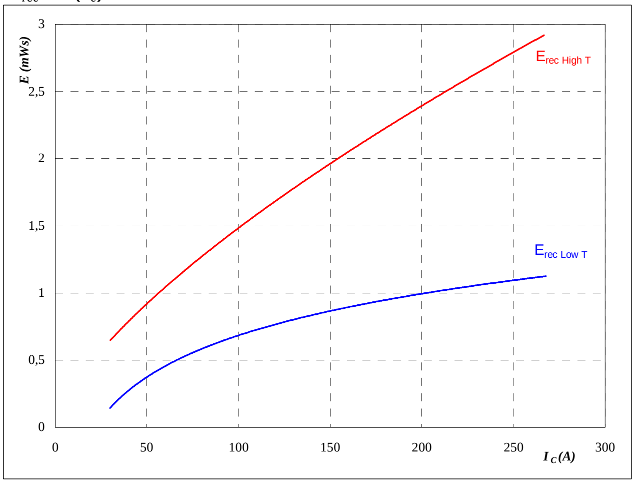
With an inductive load at

T_j =	25/150	°C
V_{CE} =	350	V
V_{GE} =	±15	V
I_C =	150	A

figure 7. **FWD**

Typical reverse recovery energy loss
as a function of collector current

$E_{rec} = f(I_c)$



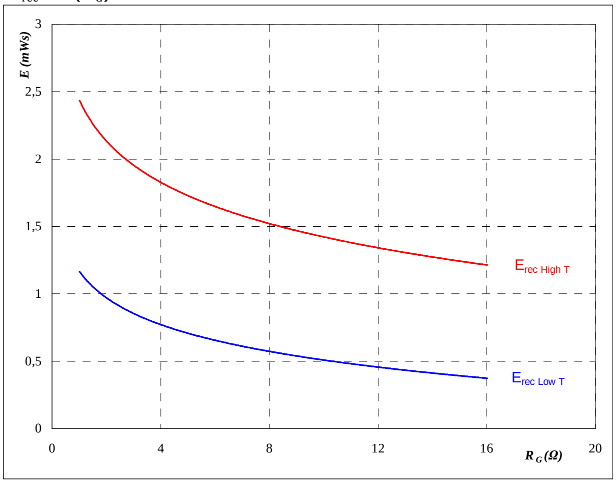
With an inductive load at

T_j =	25/150	°C
V_{CE} =	350	V
V_{GE} =	±15	V
R_{gon} =	4	Ω

figure 8. **FWD**

Typical reverse recovery energy loss
as a function of gate resistor

$E_{rec} = f(R_G)$



With an inductive load at

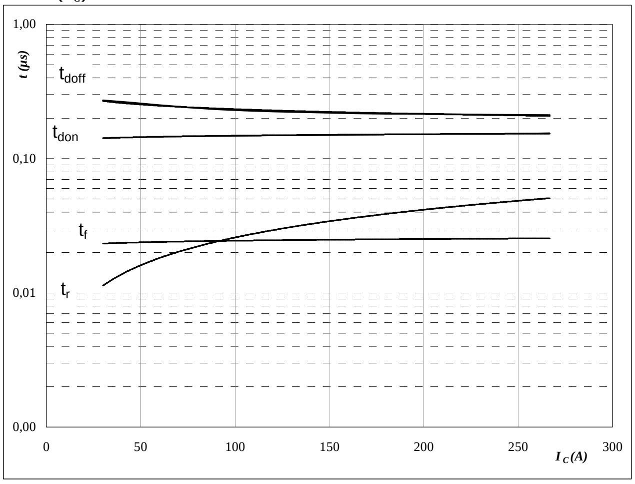
T_j =	25/150	°C
V_{CE} =	350	V
V_{GE} =	±15	V
I_C =	150	A

Buck

figure 9. **IGBT**

Typical switching times as a function of collector current

$t = f(I_C)$



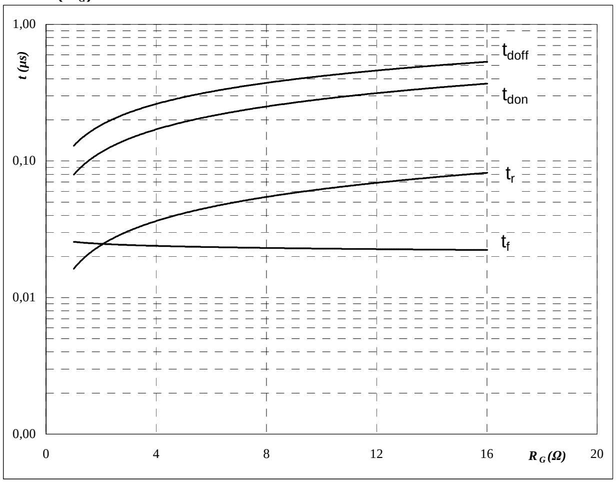
With an inductive load at

T_j =	150	°C
V_{CE} =	350	V
V_{GE} =	±15	V
R_{gon} =	4	Ω
R_{goff} =	4	Ω

figure 10. **IGBT**

Typical switching times as a function of gate resistor

$t = f(R_G)$



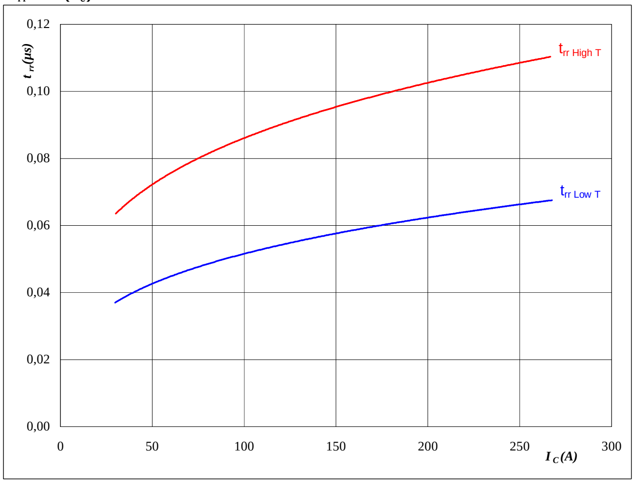
With an inductive load at

T_j =	150	°C
V_{CE} =	350	V
V_{GE} =	±15	V
I_C =	150	A

figure 11. **FWD**

Typical reverse recovery time as a function of collector current

$t_{rr} = f(I_c)$



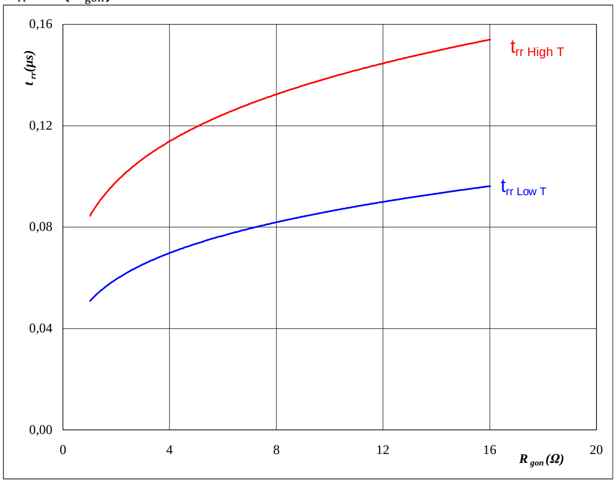
At

T_j =	25/150	°C
V_{CE} =	350	V
V_{GE} =	±15	V
R_{gon} =	4	Ω

figure 12. **FWD**

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

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



At

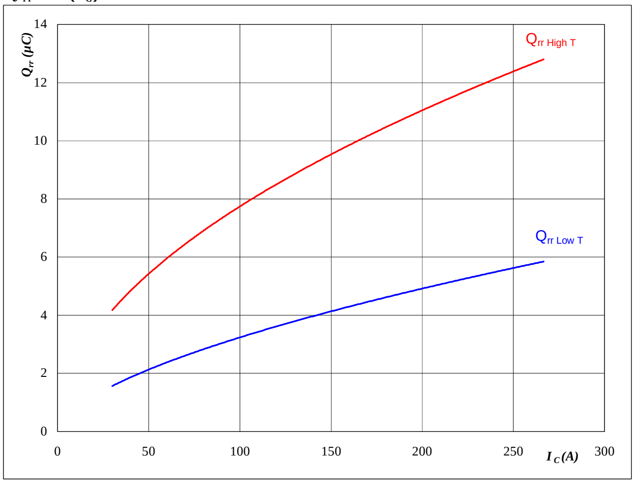
T_j =	25/150	°C
V_R =	350	V
I_F =	150	A
V_{GE} =	±15	V

Buck

figure 13. **FWD**

Typical reverse recovery charge as a function of collector current

$Q_{rr} = f(I_C)$



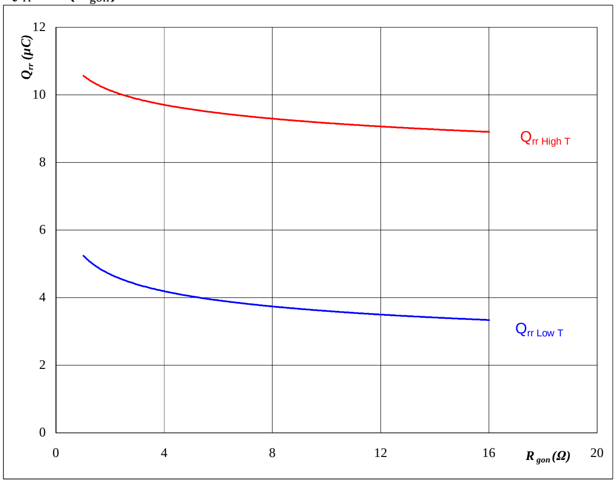
At

T_j =	25/150	°C
V_{CE} =	350	V
V_{GE} =	±15	V
R_{gon} =	4	Ω

figure 14. **FWD**

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

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



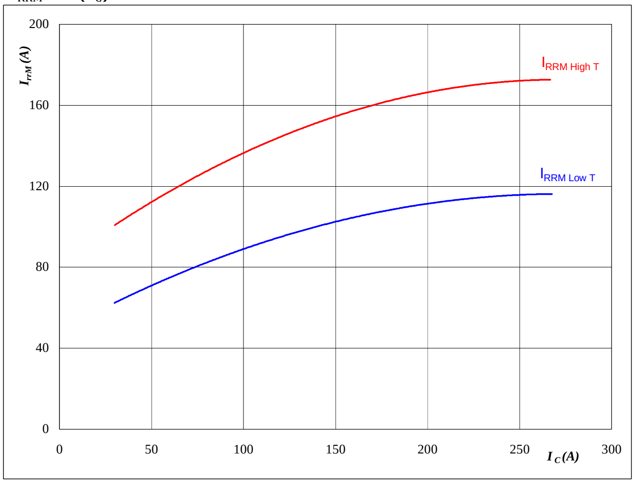
At

T_j =	25/150	°C
V_R =	350	V
I_F =	150	A
V_{GE} =	±15	V

figure 15. **FWD**

Typical reverse recovery current as a function of collector current

$I_{RRM} = f(I_C)$



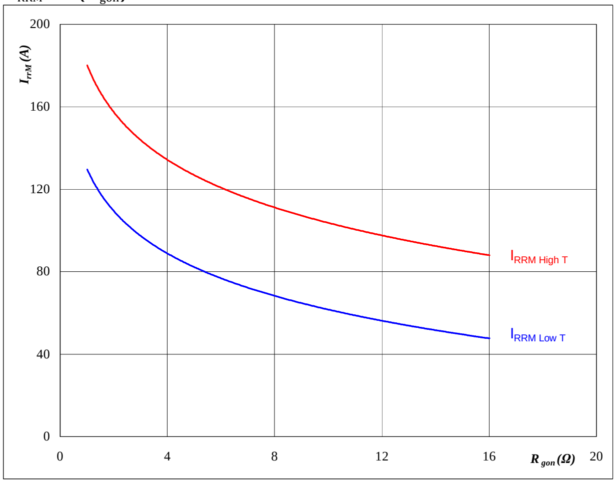
At

T_j =	25/150	°C
V_{CE} =	350	V
V_{GE} =	±15	V
R_{gon} =	4	Ω

figure 16. **FWD**

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

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



At

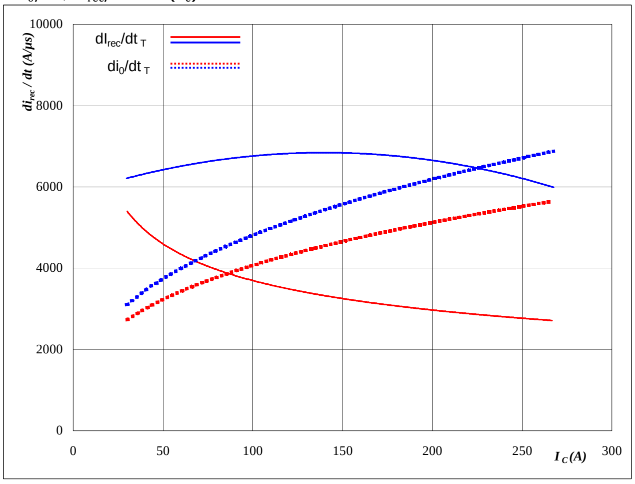
T_j =	25/150	°C
V_R =	350	V
I_F =	150	A
V_{GE} =	±15	V

Buck

figure 17. FWD

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

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



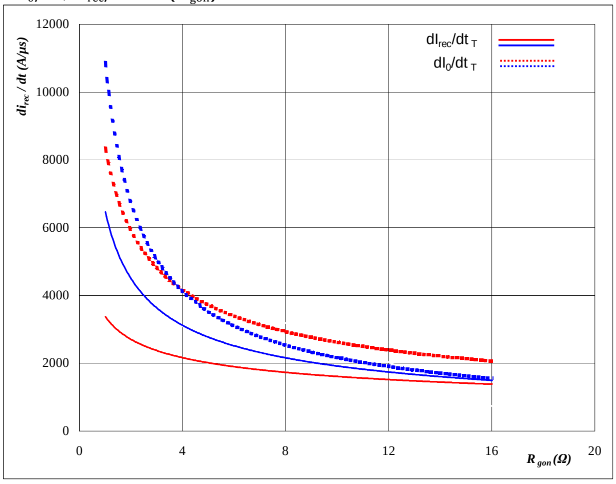
At

T_j =	25/150	°C
V_{CE} =	350	V
V_{GE} =	±15	V
R_{gon} =	4	Ω

figure 18. FWD

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

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



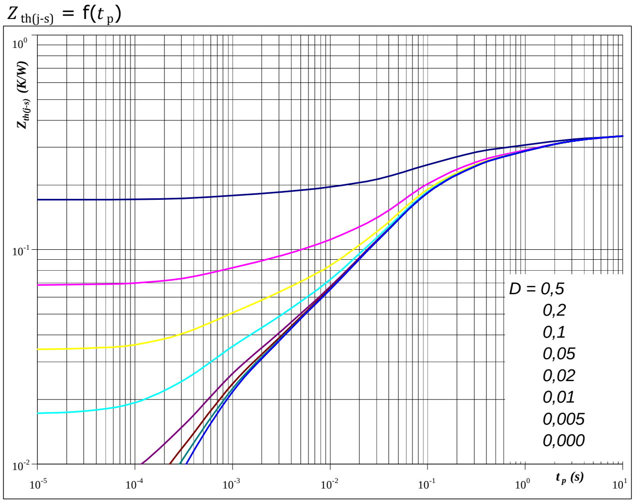
At

T_j =	25/150	°C
V_R =	350	V
I_F =	150	A
V_{GE} =	±15	V

figure 19. IGBT

IGBT transient thermal impedance as a function of pulse width

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



At

D =	t_p / T	
$R_{th(j\text{-}s)}$ =	0,34	K/W

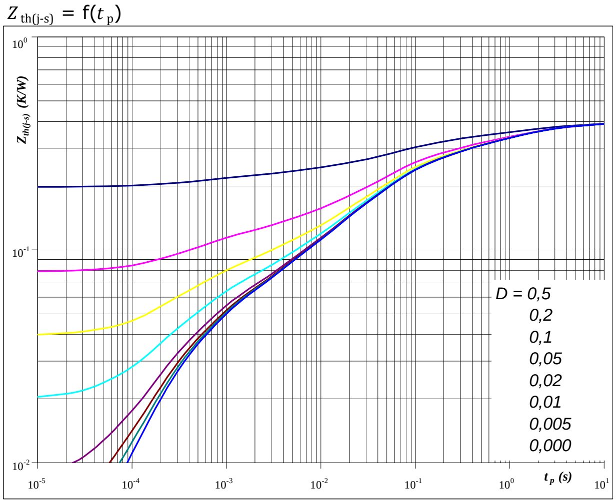
IGBT thermal model values

R (K/W)	Tau (s)
4,43E-02	3,55E+00
6,46E-02	8,58E-01
1,01E-01	1,36E-01
9,03E-02	4,30E-02
2,31E-02	4,39E-03
1,76E-02	6,24E-04

figure 20. FWD

FWD transient thermal impedance as a function of pulse width

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



At

D =	t_p / T	
$R_{th(j\text{-}s)}$ =	0,39	K/W

FWD thermal model values

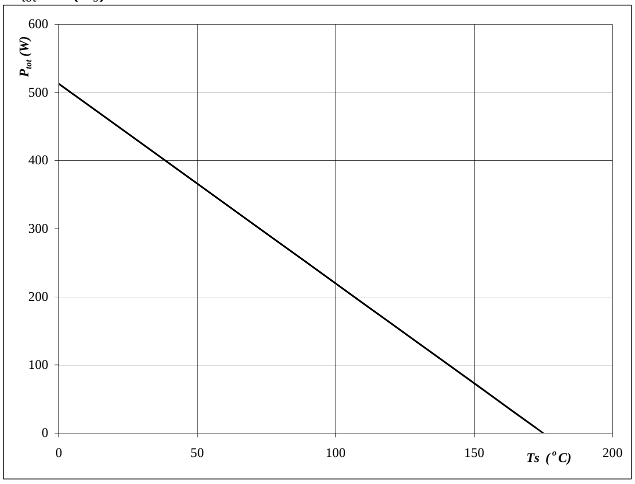
R (K/W)	Tau (s)
4,62E-02	3,80E+00
6,71E-02	9,22E-01
5,38E-02	2,23E-01
1,26E-01	5,05E-02
3,49E-02	1,17E-02
3,03E-02	2,42E-03

Buck

figure 21. **IGBT**

Power dissipation as a function of heatsink temperature

$P_{tot} = f(T_s)$



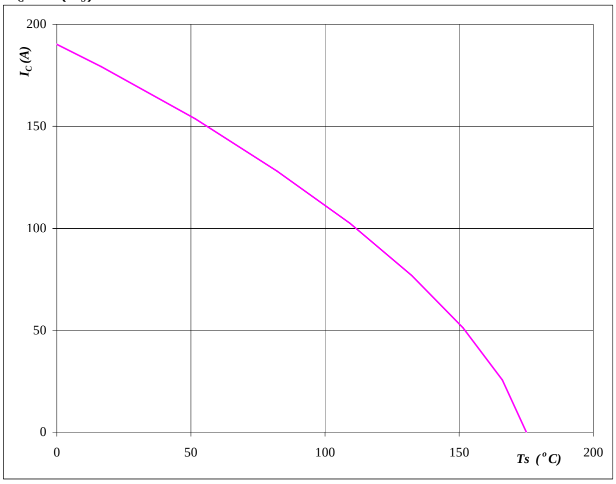
At

T_j = 175 °C

figure 22. **IGBT**

Collector current as a function of heatsink temperature

$I_C = f(T_s)$



At

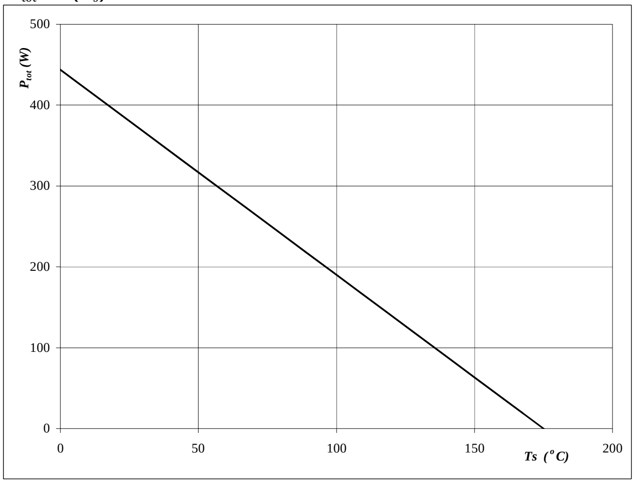
T_j = 175 °C

V_{GE} = 15 V

figure 23. **FWD**

Power dissipation as a function of heatsink temperature

$P_{tot} = f(T_s)$



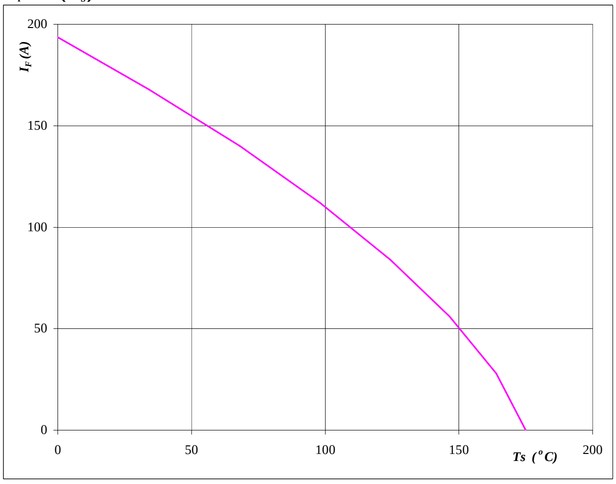
At

T_j = 175 °C

figure 24. **FWD**

Forward current as a function of heatsink temperature

$I_F = f(T_s)$



At

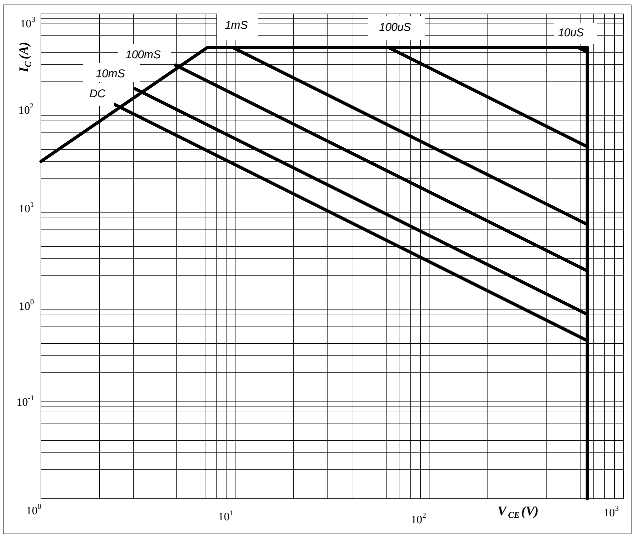
T_j = 175 °C

Buck

figure 25.	IGBT

Safe operating area as a function of collector-emitter voltage

$I_C = f(V_{CE})$



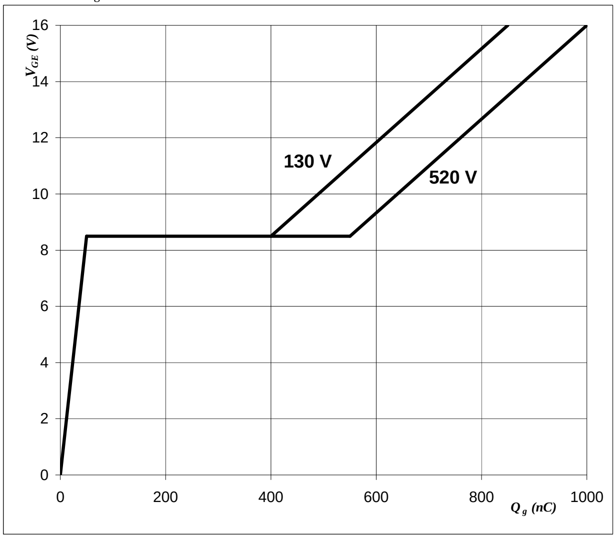
At

D =	single pulse	
T_s =	80	ºC
V_{GE} =	±15	V
T_j =	T_{jmax}	ºC

figure 26.	IGBT

Gate voltage vs Gate charge

$V_{GE} = f(Q_g)$



At

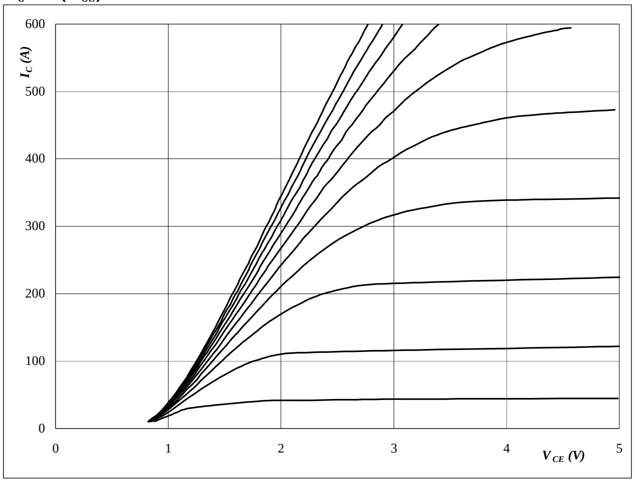
I_C =	150	A

Boost

figure 1. **IGBT**

Typical output characteristics

$I_C = f(V_{CE})$



At

t_p = 350 µs

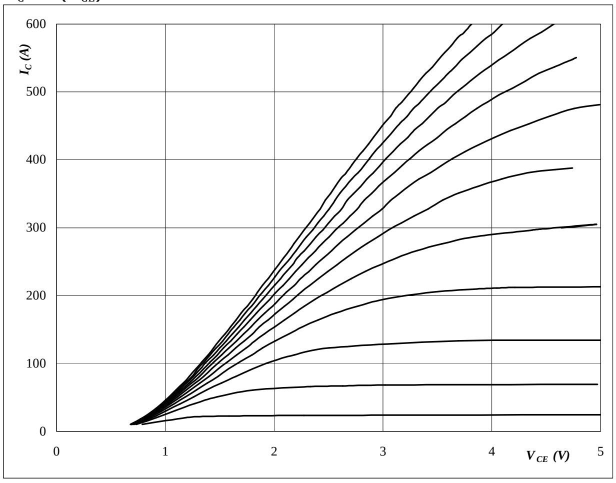
T_j = 25 °C

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

figure 2. **IGBT**

Typical output characteristics

$I_C = f(V_{CE})$



At

t_p = 350 µs

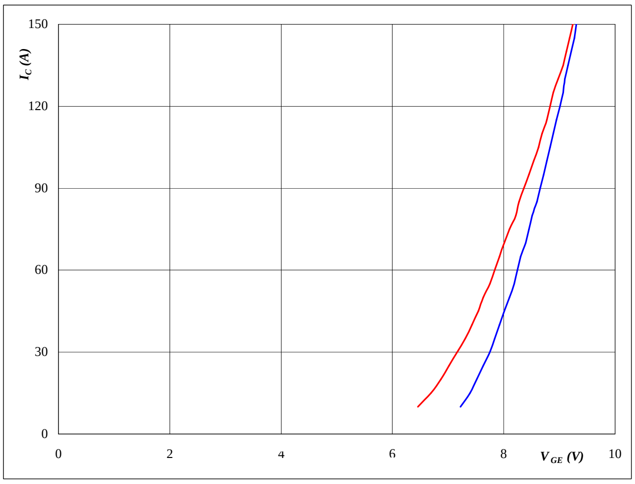
T_j = 150 °C

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

figure 3. **IGBT**

Typical transfer characteristics

$I_C = f(V_{GE})$



At

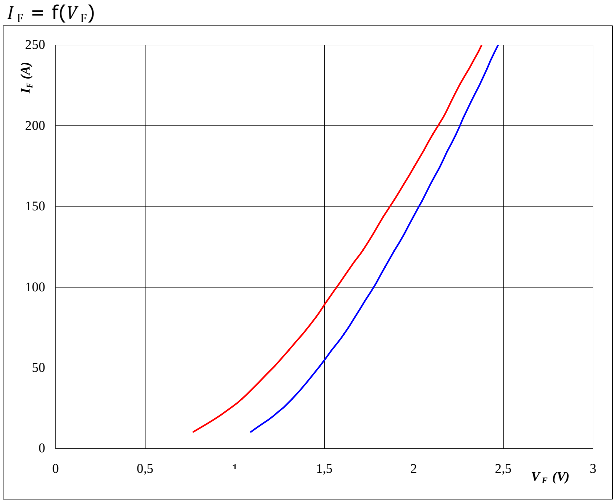
t_p = 350 µs

V_{CE} = 10 V

figure 4. **FWD**

Typical diode forward current as a function of forward voltage

$I_F = f(V_F)$



At

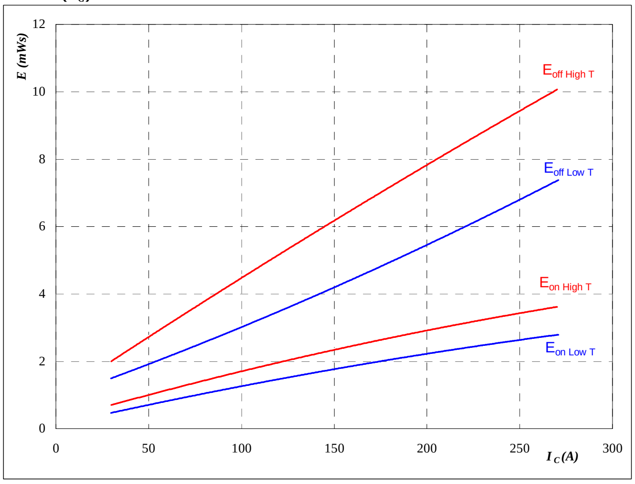
t_p = 350 µs

Boost

figure 5. **IGBT**

Typical switching energy losses
as a function of collector current

$E = f(I_C)$



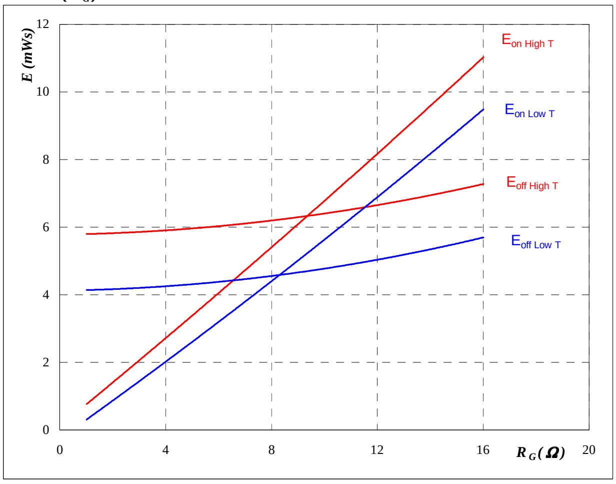
With an inductive load at

T_j =	25/150	°C
V_{CE} =	350	V
V_{GE} =	±15	V
R_{gon} =	4	Ω
R_{goff} =	4	Ω

figure 6. **IGBT**

Typical switching energy losses
as a function of gate resistor

$E = f(R_G)$



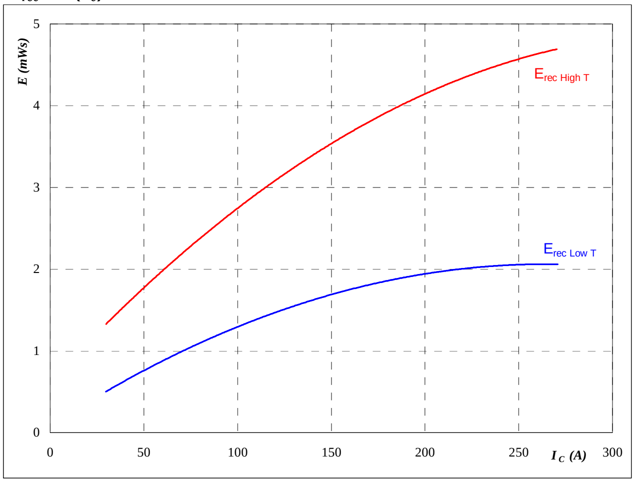
With an inductive load at

T_j =	25/150	°C
V_{CE} =	350	V
V_{GE} =	±15	V
I_C =	150	A

figure 7. **FWD**

Typical reverse recovery energy loss
as a function of collector current

$E_{rec} = f(I_C)$



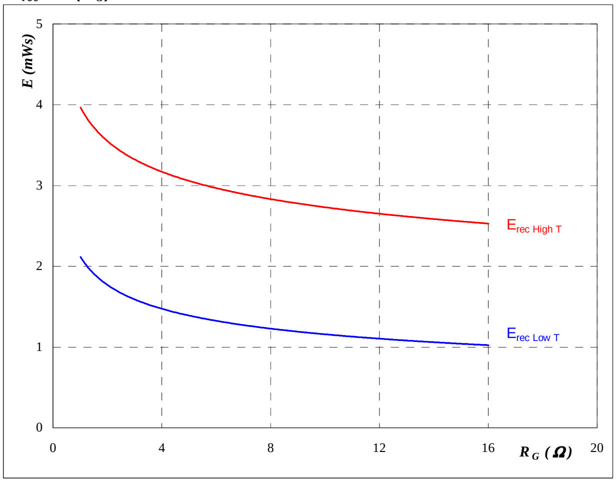
With an inductive load at

T_j =	25/150	°C
V_{CE} =	350	V
V_{GE} =	±15	V
R_{gon} =	4	Ω

figure 8. **FWD**

Typical reverse recovery energy loss
as a function of gate resistor

$E_{rec} = f(R_G)$



With an inductive load at

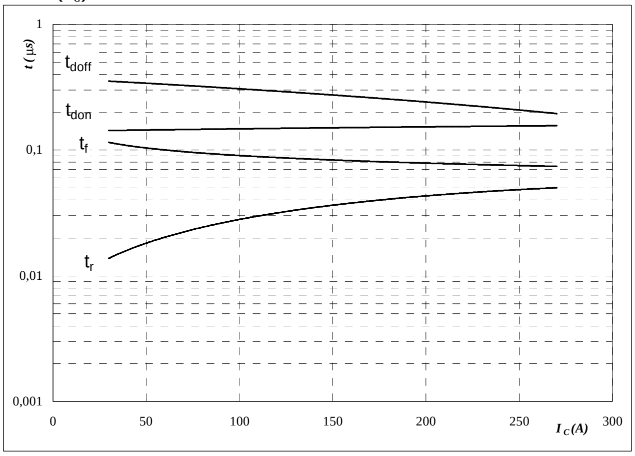
T_j =	25/150	°C
V_{CE} =	350	V
V_{GE} =	±15	V
I_C =	150	A

Boost

figure 9. **IGBT**

Typical switching times as a function of collector current

$t = f(I_C)$



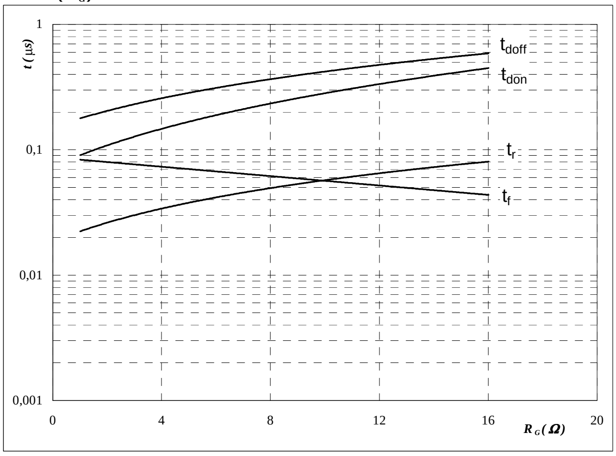
With an inductive load at

T_j =	150	°C
V_{CE} =	350	V
V_{GE} =	±15	V
R_{gon} =	4	Ω
R_{goff} =	4	Ω

figure 10. **IGBT**

Typical switching times as a function of gate resistor

$t = f(R_G)$



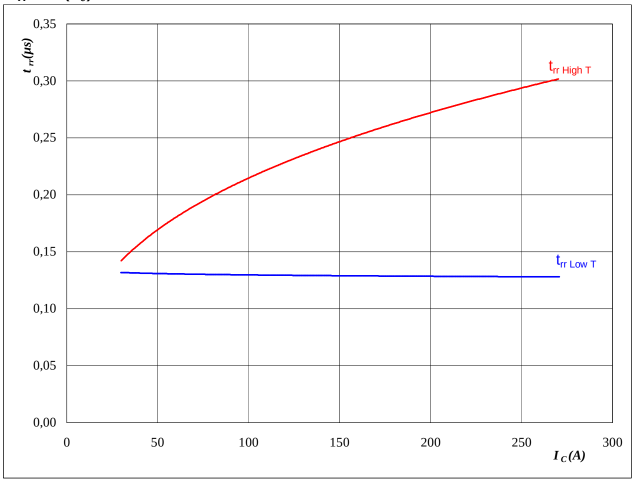
With an inductive load at

T_j =	150	°C
V_{CE} =	350	V
V_{GE} =	±15	V
I_C =	150	A

figure 11. **FWD**

Typical reverse recovery time as a function of collector current

$t_{rr} = f(I_c)$



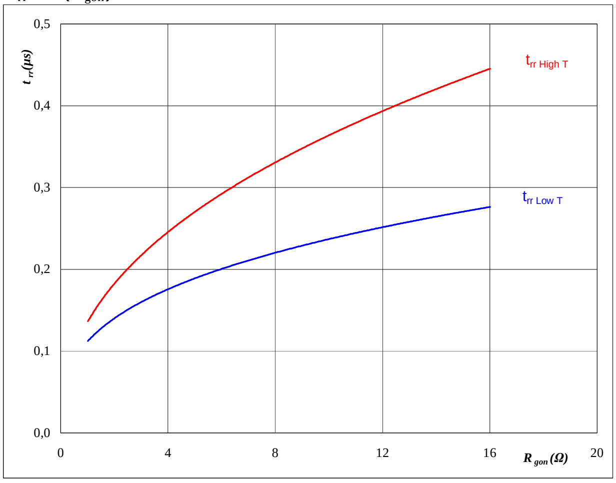
At

T_j =	25/150	°C
V_{CE} =	350	V
V_{GE} =	±15	V
R_{gon} =	4	Ω

figure 12. **FWD**

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

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



At

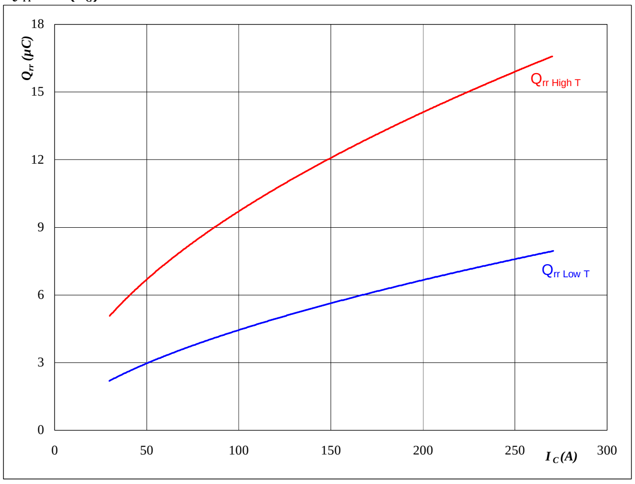
T_j =	25/150	°C
V_R =	350	V
I_F =	150	A
V_{GE} =	±15	V

Boost

figure 13. **FWD**

Typical reverse recovery charge as a function of collector current

$Q_{rr} = f(I_C)$



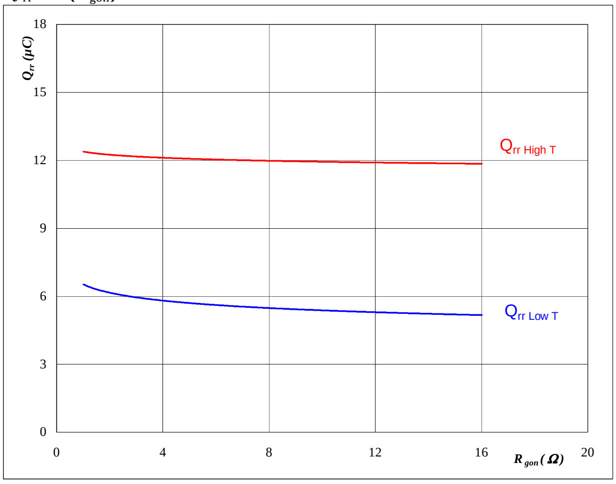
At

T_j =	25/150	°C
V_{CE} =	350	V
V_{GE} =	±15	V
R_{gon} =	4	Ω

figure 14. **FWD**

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

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



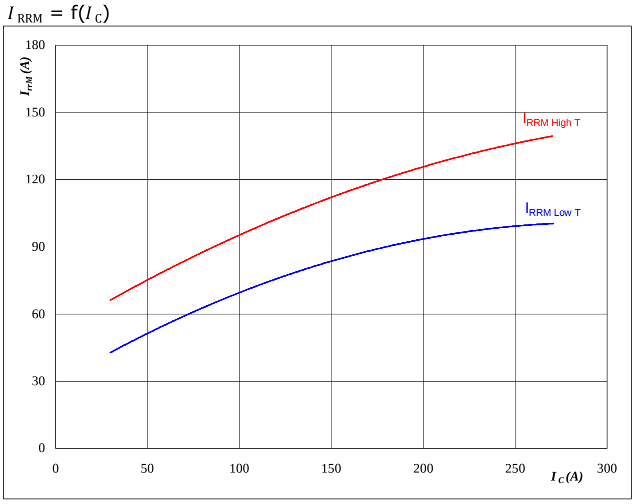
At

T_j =	25/150	°C
V_R =	350	V
I_F =	150	A
V_{GE} =	±15	V

figure 15. **FWD**

Typical reverse recovery current as a function of collector current

$I_{RRM} = f(I_C)$



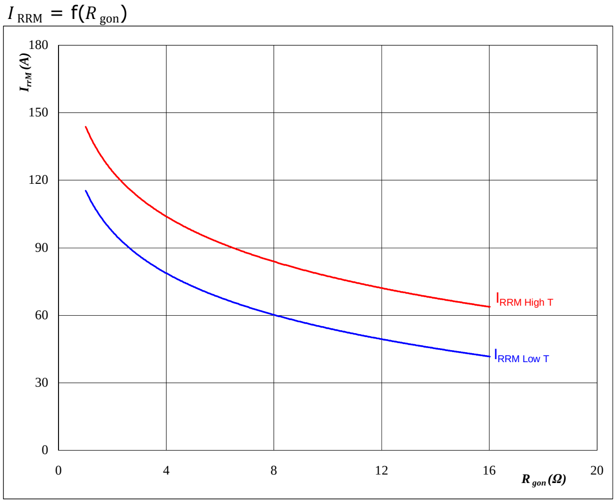
At

T_j =	25/150	°C
V_{CE} =	350	V
V_{GE} =	±15	V
R_{gon} =	4	Ω

figure 16. **FWD**

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

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



At

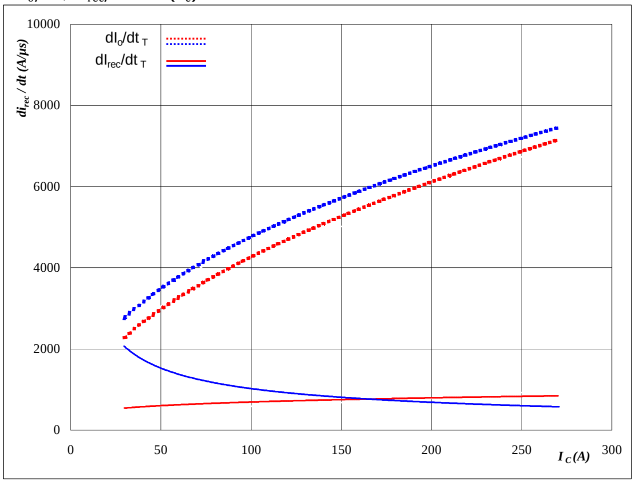
T_j =	25/150	°C
V_R =	350	V
I_F =	150	A
V_{GE} =	±15	V

Boost

figure 17. **FWD**

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

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



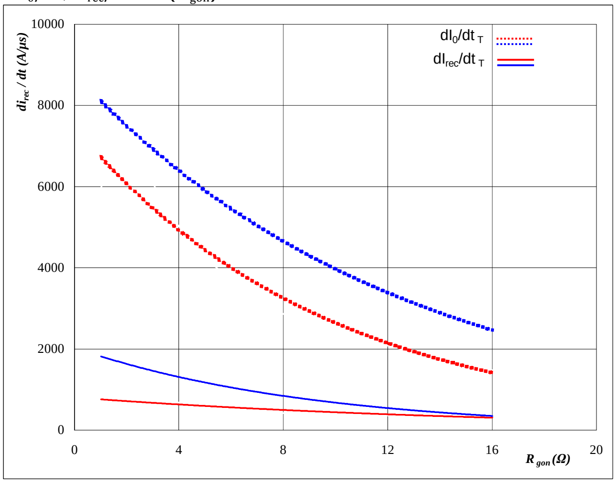
At

T_j =	25/150	°C
V_{CE} =	350	V
V_{GE} =	±15	V
R_{gon} =	4	Ω

figure 18. **FWD**

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

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



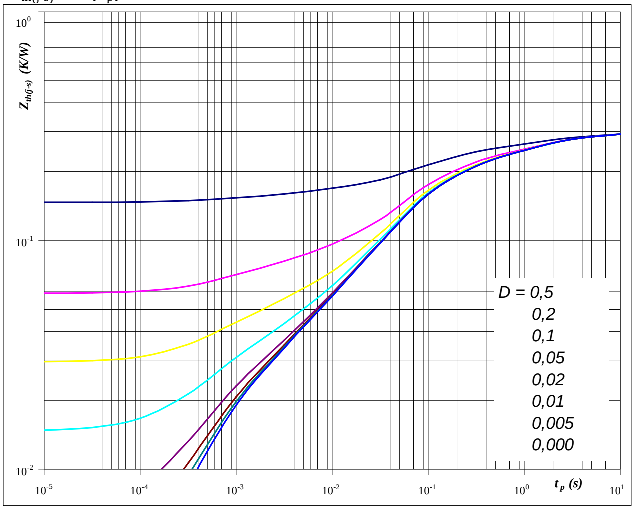
At

T_j =	25/150	°C
V_R =	350	V
I_F =	150	A
V_{GE} =	±15	V

figure 19. **IGBT**

IGBT transient thermal impedance as a function of pulse width

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



At

D =	t_p / T	
$R_{th(j-s)}$ =	0,29	K/W

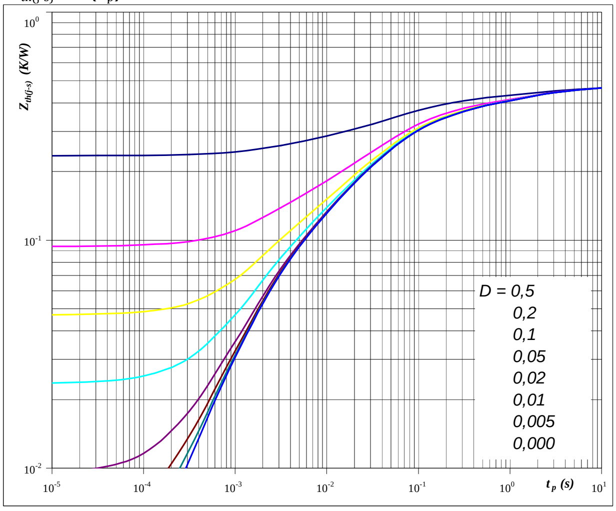
IGBT thermal model values

R (K/W)	Tau (s)
4,40E-02	2,95E+00
5,08E-02	7,93E-01
7,83E-02	1,41E-01
8,59E-02	4,33E-02
2,00E-02	3,83E-03
1,46E-02	5,99E-04

figure 20. **FWD**

FWD transient thermal impedance as a function of pulse width

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



At

D =	t_p / T	
$R_{th(j-s)}$ =	0,47	K/W

FWD thermal model values

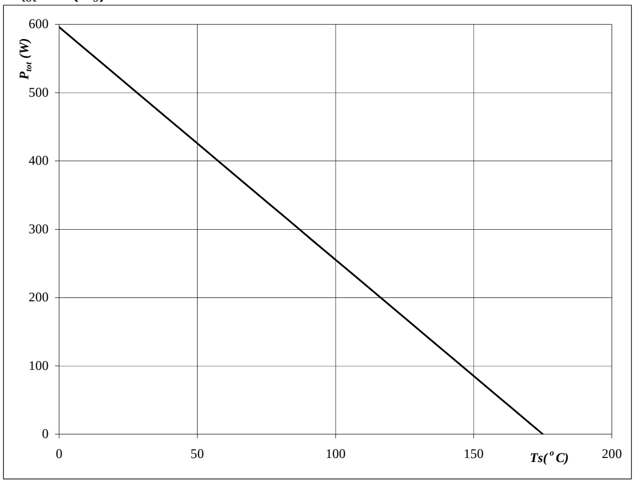
R (K/W)	Tau (s)
4,73E-02	4,12E+00
6,76E-02	9,18E-01
1,01E-01	1,37E-01
1,41E-01	3,83E-02
6,28E-02	8,98E-03
4,92E-02	1,99E-03

Boost

figure 21. **IGBT**

Power dissipation as a function of heatsink temperature

$P_{tot} = f(T_s)$



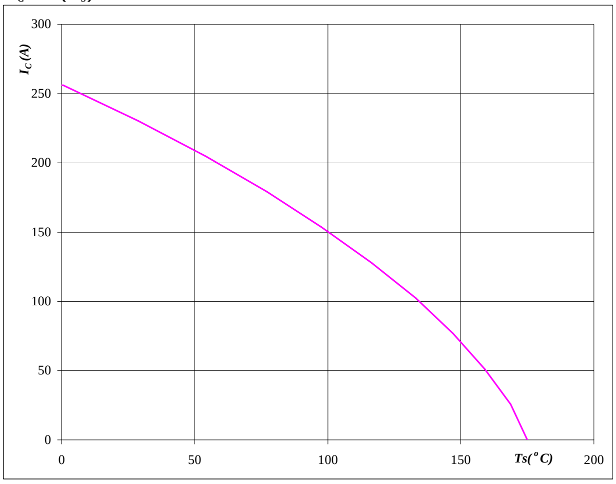
At

T_j = 175 ºC

figure 22. **IGBT**

Collector current as a function of heatsink temperature

$I_C = f(T_s)$



At

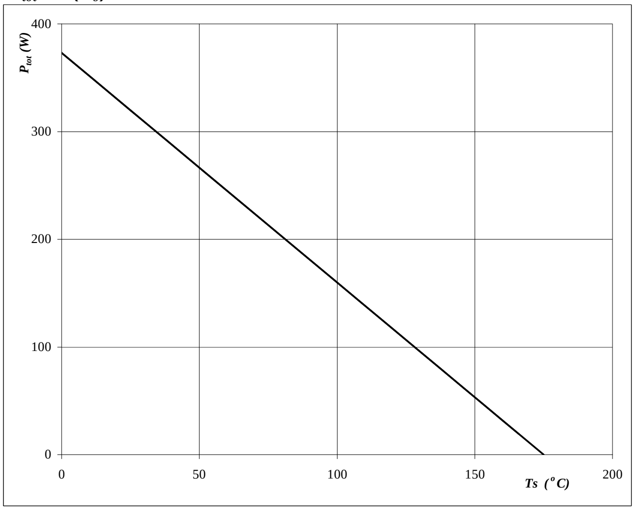
T_j = 175 ºC

V_{GE} = 15 V

figure 23. **FWD**

Power dissipation as a function of heatsink temperature

$P_{tot} = f(T_s)$



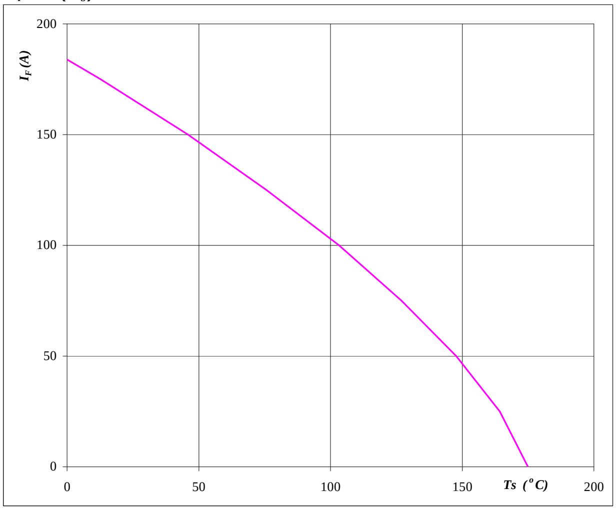
At

T_j = 175 ºC

figure 24. **FWD**

Forward current as a function of heatsink temperature

$I_F = f(T_s)$



At

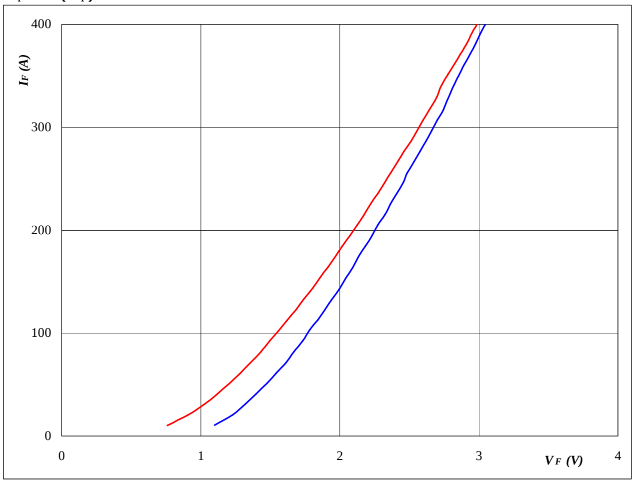
T_j = 175 ºC

Boost inv. Diode

figure 25. **Boost Inverse Diode**

Typical diode forward current as a function of forward voltage

$I_F = f(V_F)$



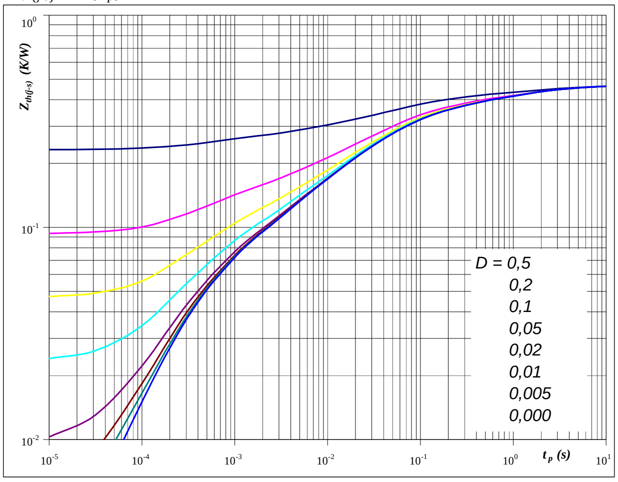
At

t_p = 250 µs

figure 26. **Boost Inverse Diode**

Diode transient thermal impedance as a function of pulse width

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



At

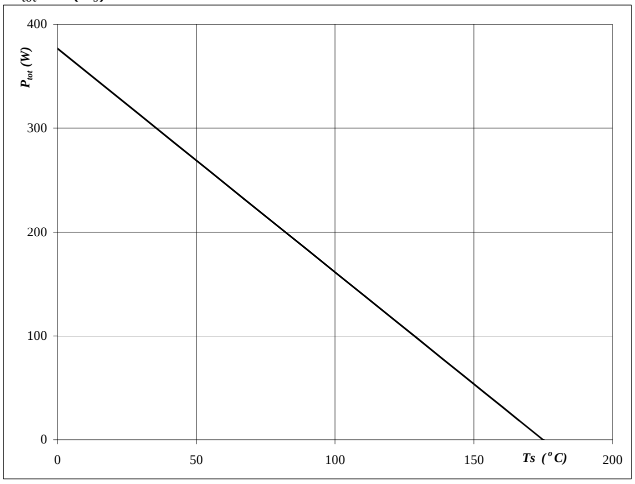
D = t_p / T

$R_{th(j\text{-}s)}$ = 0,46 K/W

figure 27. **Boost Inverse Diode**

Power dissipation as a function of heatsink temperature

$P_{tot} = f(T_s)$



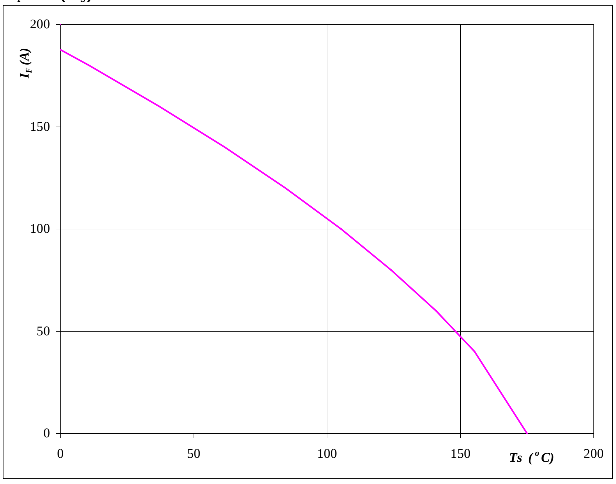
At

T_j = 175 ºC

figure 28. **Boost Inverse Diode**

Forward current as a function of heatsink temperature

$I_F = f(T_s)$



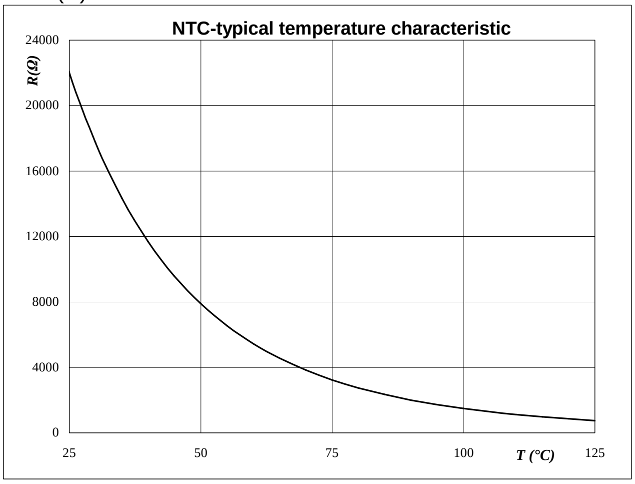
At

T_j = 175 ºC

Thermistor

figure 1.	Thermistor

Typical NTC characteristic
as a function of temperature
$R = \mathrm{f}(T)$



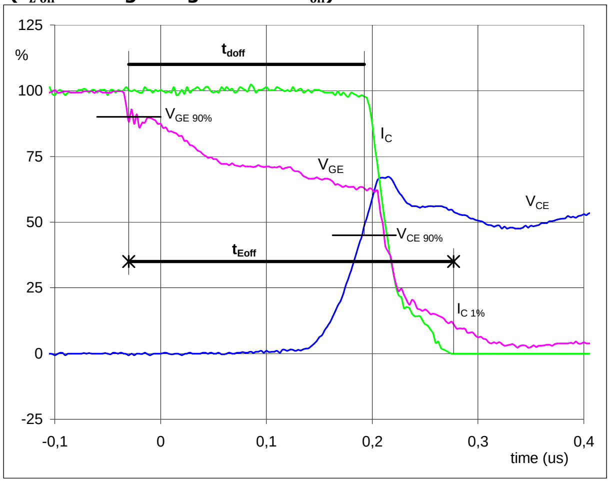
Switching Definitions BUCK

General conditions

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

figure 1. **IGBT**

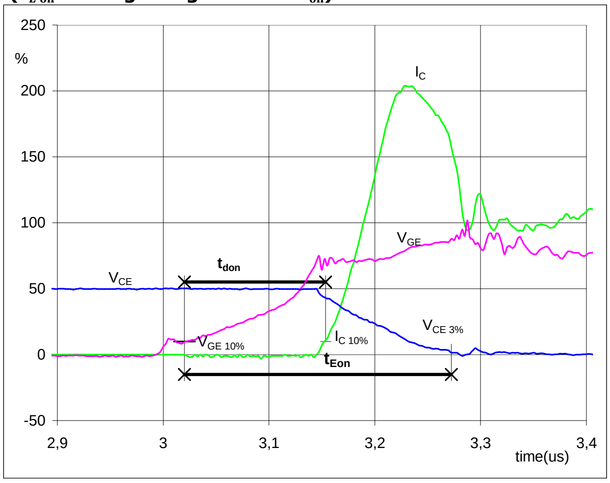
Turn-off Switching Waveforms & definition of t_{doff}, t_{Eoff}
($t_{E\,off}$ = integrating time for E_{off})



V_{GE} (0%) =	-15	V
V_{GE} (100%) =	15	V
V_C (100%) =	700	V
I_C (100%) =	150	A
t_{doff} =	0,22	μs
$t_{E\,off}$ =	0,31	μs

figure 2. **IGBT**

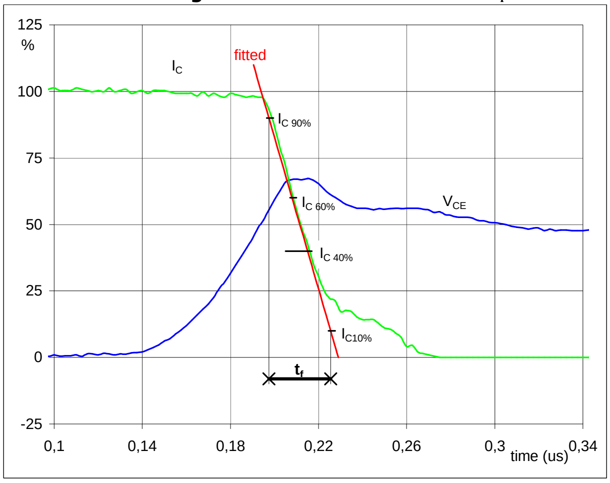
Turn-on Switching Waveforms & definition of t_{don}, t_{Eon}
($t_{E\,on}$ = integrating time for E_{on})



V_{GE} (0%) =	-15	V
V_{GE} (100%) =	15	V
V_C (100%) =	700	V
I_C (100%) =	150	A
t_{don} =	0,15	μs
$t_{E\,on}$ =	0,25	μs

figure 3. **IGBT**

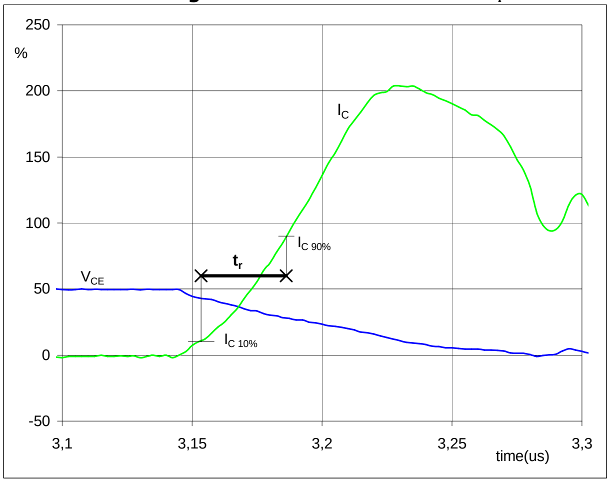
Turn-off Switching Waveforms & definition of t_f



V_C (100%) =	700	V
I_C (100%) =	150	A
t_f =	0,03	μs

figure 4. **IGBT**

Turn-on Switching Waveforms & definition of t_r

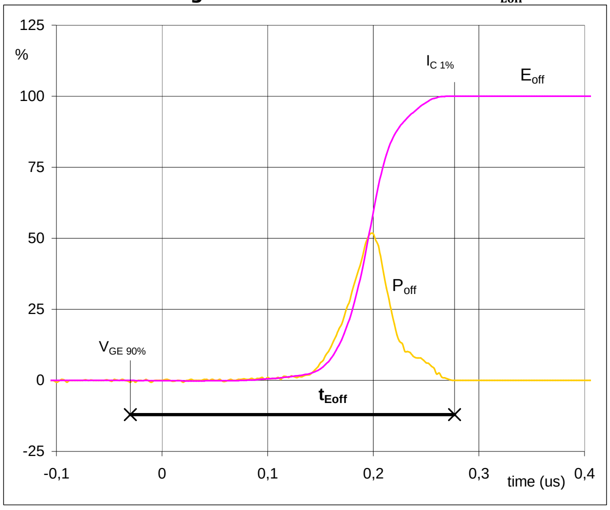


V_C (100%) =	700	V
I_C (100%) =	150	A
t_r =	0,03	μs

Switching Definitions BUCK

figure 5.	IGBT

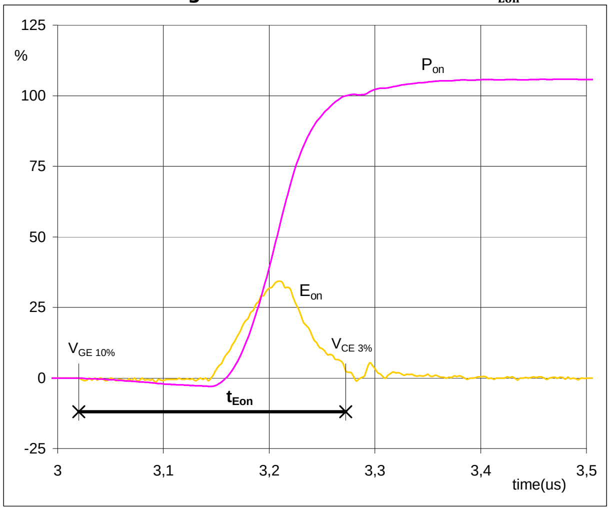
Turn-off Switching Waveforms & definition of t_{Eoff}



P_{off} (100%) = 105 kW
E_{off} (100%) = 2,68 mJ
$t_{E\,off}$ = 0,31 µs

figure 6.	IGBT

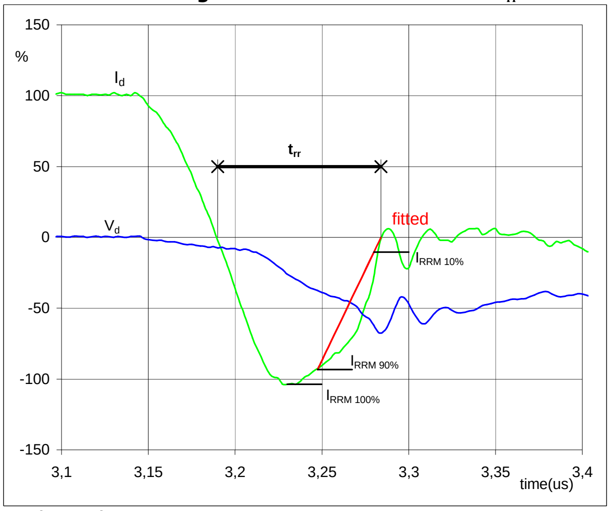
Turn-on Switching Waveforms & definition of t_{Eon}



P_{on} (100%) = 105 kW
E_{on} (100%) = 2,45 mJ
$t_{E\,on}$ = 0,25 µs

figure 8.	FWD

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

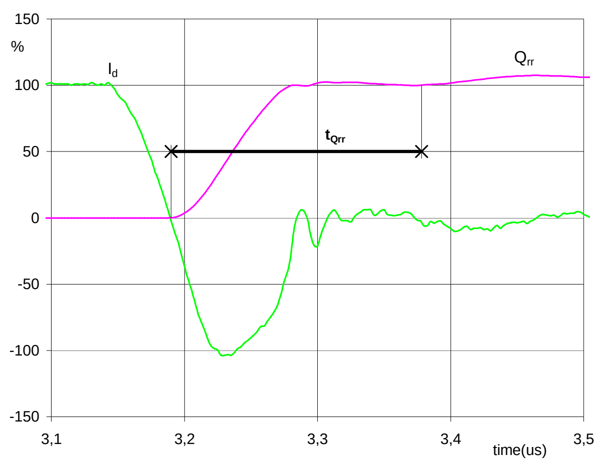


V_d (100%) = 700 V
I_d (100%) = 150 A
I_{RRM} (100%) = -157 A
t_{rr} = 0,10 µs

Switching Definitions BUCK

figure 9. **FWD**

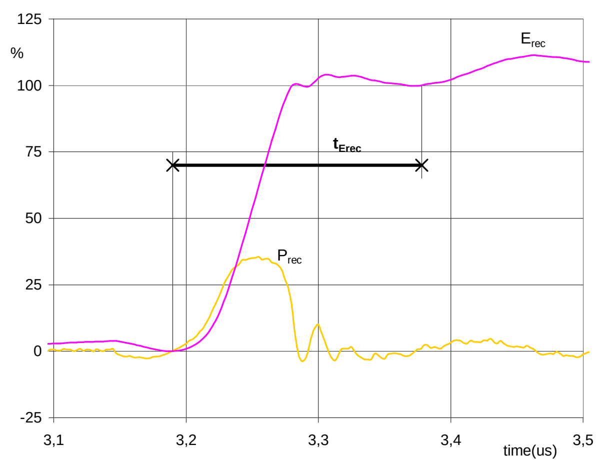
Turn-on Switching Waveforms & definition of t_{Qrr}
($t_{Q\,rr}$ = integrating time for Q_{rr})



I_d (100%) =	150	A
Q_{rr} (100%) =	9,91	μC
$t_{Q\,rr}$ =	0,19	μs

figure 10. **FWD**

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



P_{rec} (100%) =	105,00	kW
E_{rec} (100%) =	2,07	mJ
$t_{E\,rec}$ =	0,19	μs

Ordering Code and Marking - Outline - Pinout

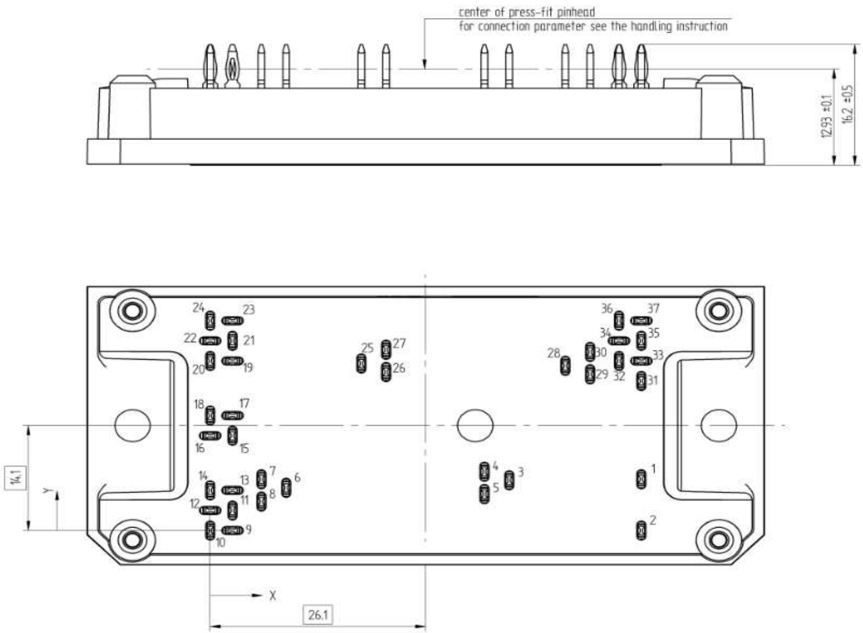
Ordering Code & Marking

Version	Ordering Code
with thermal paste 12mm housing with Press-fit pins	10-PY07NIB150SG-M136F38Y-/3/

Text	VIN	Date code	Name&Ver	UL	Lot	Serial
	VIN	WWYY	NNNNNNVV	UL	LLLLL	SSSS
Datamatrix	Type&Ver	Lot number	Serial	Date code		
	TTTTTTVV	LLLLL	SSSS	WWYY		

Outline

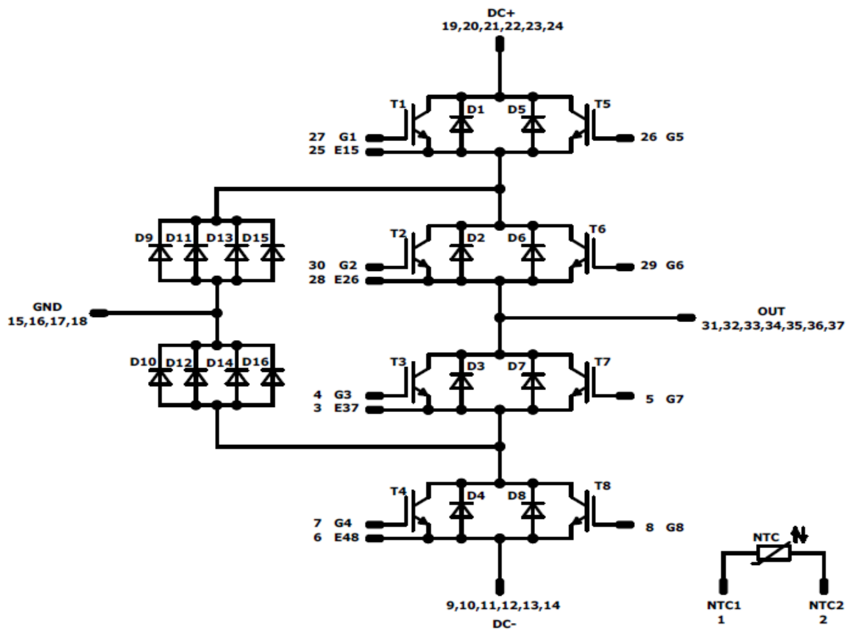
Pin table			
Pin	X	Y	Function
1	52,2	6,9	NTC1
2	52,2	0	NTC2
3	36,2	6,75	E37
4	33,2	7,9	G3
5	33,2	4,9	G7
6	9,2	5,75	E48
7	6,2	6,9	G4
8	6,2	3,9	G8
9	2,7	0	DC-
10	0	0	DC-
11	2,7	2,7	DC-
12	0	2,7	DC-
13	2,7	5,4	DC-
14	0	5,4	DC-
15	2,7	12,75	GND
16	0	12,75	GND
17	2,7	15,45	GND
18	0	15,45	GND
19	2,7	22,8	DC+
20	0	22,8	DC+
21	2,7	25,5	DC+
22	0	25,5	DC+
23	2,7	28,2	DC+
24	0	28,2	DC+
25	18,3	22,45	E15
26	21,3	21,3	G5
27	21,3	24,3	G1
28	43	22,15	E26
29	46	21	G6
30	46	24	G2
31	52,2	20,1	OUT
32	49,5	22,8	OUT
33	52,2	22,8	OUT
34	49,5	25,5	OUT
35	52,2	25,5	OUT
36	49,5	28,2	OUT
37	52,2	28,2	OUT



Tolerance of pinpositions ±0,5mm at the end of pins
Dimension of coordinate axis is only offset without tolerance

Ordering Code and Marking - Outline - Pinout

Pinout



Identification

ID	Component	Voltage	Current	Function	Comment
T1,T4,T5,T8	IGBT	650 V	75 A	Buck IGBT	
D9,D10,D11,D12 D13,D14,D15,D16	FWD	650 V	40 A	Buck Diode	
T2,T3,T6,T7	IGBT	600 V	75 A	Boost IGBT	
D1,D4,D5,D8	FWD	650 V	50 A	Boost Diode	
D2,D3,D6,D7	FWD	600 V	50 A	Boost Inverse Diode	
NTC	Thermistor			Thermistor	

Packaging instruction					
Standard packaging quantity (SPQ)	**100**	>SPQ	Standard	<SPQ	Sample

Handling instruction
Handling instructions for *flow* 1 packages see vincotech.com website.

Package data
Package data for *flow* 1 packages see vincotech.com website.

UL recognition and file number
This device is certified according to UL 1557 standard, UL file number E192116. For more information see vincotech.com website.

Document No.:	Date:	Modification:	Pages
10-PY07NIB150SG-M136F38Y-D2-14	21 Jul. 2016	New brand, new outline	all