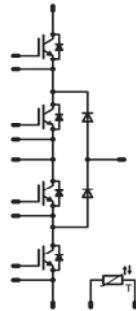


flowNPC0		600V/75A	
Features • Neutral-point-Clamped inverter • Clip-In PCB mounting • Low Inductance Layout		flow0 housing 	
Target Applications • UPS and Solar		Schematic 	
Types • 10-FZ06NIA075SA-P926F33			

Maximum Ratings

T_j=25°C, unless otherwise specified

Parameter	Symbol	Condition	Value	Unit
-----------	--------	-----------	-------	------

Buck IGBT

Collector-emitter break down voltage	V _{CES}		600	V
DC collector current	I _C	T _j =T _{jmax} T _h =80°C T _c =80°C	64 80	A
Pulsed collector current	I _{Cpulse}	t _p limited by T _{jmax}	225	A
Power dissipation per IGBT	P _{tot}	T _j =T _{jmax} T _h =80°C T _c =80°C	111 168	W
Gate-emitter peak voltage	V _{GE}		±20	V
Short circuit ratings	t _{SC} V _{CC}	T _j ≤150°C V _{GE} =15V	6 360	μs V
Maximum Junction Temperature	T _{jmax}		175	°C
Turn off safe operating area		T _j ≤150°C V _{CE} ≤V _{CES}	150	A

Buck FWD

Peak Repetitive Reverse Voltage	V _{RRM}	T _j =25°C	600	V
DC forward current	I _F	T _j =T _{jmax} T _h =80°C T _c =80°C	56 76	A
Repetitive peak forward current	I _{FRM}	t _p limited by T _{jmax} T _c =100°C	150	A
Power dissipation per Diode	P _{tot}	T _j =T _{jmax} T _h =80°C T _c =80°C	70 107	W
Maximum Junction Temperature	T _{jmax}		175	°C

Maximum Ratings

 $T_J=25^{\circ}\text{C}$, unless otherwise specified

Parameter	Symbol	Condition	Value	Unit
Boost IGBT				
Collector-emitter break down voltage	V_{CES}		600	V
DC collector current	I_C	$T_J=T_{Jmax}$ $T_h=80^{\circ}\text{C}$ $T_c=80^{\circ}\text{C}$	64 80	A
Pulsed collector current	I_{Cpuls}	t_p limited by T_{Jmax}	225	A
Power dissipation per IGBT	P_{tot}	$T_J=T_{Jmax}$ $T_h=80^{\circ}\text{C}$ $T_c=80^{\circ}\text{C}$	111 168	W
Gate-emitter peak voltage	V_{GE}		± 20	V
Short circuit ratings	t_{SC} V_{CC}	$T_J \leq 150^{\circ}\text{C}$ $V_{GE} = 15\text{V}$	6 360	μs V
Maximum Junction Temperature	T_{Jmax}		175	$^{\circ}\text{C}$
Turn off safe operating area		$T_J \leq 150^{\circ}\text{C}$ $V_{CE} \leq V_{CES}$	150	A

Buck and Boost Inverse FWD

Peak Repetitive Reverse Voltage	V_{RRM}	$T_c=25^{\circ}\text{C}$	600	V
DC forward current	I_F	$T_J=T_{Jmax}$ $T_h=80^{\circ}\text{C}$ $T_c=80^{\circ}\text{C}$	54 77	A
Repetitive peak forward current	I_{FRM}	t_p limited by T_{Jmax}	150	A
Power dissipation per Diode	P_{tot}	$T_J=T_{Jmax}$ $T_h=80^{\circ}\text{C}$ $T_c=80^{\circ}\text{C}$	70 107	W
Maximum Junction Temperature	T_{Jmax}		175	$^{\circ}\text{C}$

Thermal Properties

Storage temperature	T_{stg}		$-40 \dots +125$	$^{\circ}\text{C}$
Operation temperature under switching condition	T_{op}		$-40 \dots (T_{Jmax} - 25)$	$^{\circ}\text{C}$

Insulation Properties

Insulation voltage	V_{is}	$t=2\text{s}$ DC voltage	4000	V
Creepage distance			min 12,7	mm
Clearance			min 12,7	mm

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 $I_b[A]$	T_j	Min	Typ	Max	
Buck IGBT										
Gate emitter threshold voltage	$V_{GE(th)}$	$V_{CE}=V_{GE}$			0,0012	$T_j=25^{\circ}C$ $T_j=125^{\circ}C$	5	5,8	6,5	V
Collector-emitter saturation voltage	$V_{CE(sat)}$		15		75	$T_j=25^{\circ}C$ $T_j=125^{\circ}C$		1,58 1,83		V
Collector-emitter cut-off current incl. Diode	I_{CES}		0	600		$T_j=25^{\circ}C$ $T_j=125^{\circ}C$			30	μA
Gate-emitter leakage current	I_{GES}		20	0		$T_j=25^{\circ}C$ $T_j=125^{\circ}C$			700	nA
Integrated Gate resistor	R_{gint}							none		Ω
Turn-on delay time	$t_{d(on)}$	Rgoff=8 Ω Rgon=8 Ω	± 15	350	75	$T_j=25^{\circ}C$ $T_j=125^{\circ}C$		144 145		ns
Rise time	t_r					$T_j=25^{\circ}C$ $T_j=125^{\circ}C$		17 21		
Turn-off delay time	$t_{d(off)}$					$T_j=25^{\circ}C$ $T_j=125^{\circ}C$		207 228		
Fall time	t_f					$T_j=25^{\circ}C$ $T_j=125^{\circ}C$		104 124		
Turn-on energy loss per pulse	E_{on}					$T_j=25^{\circ}C$ $T_j=125^{\circ}C$		1,48 1,88		mWs
Turn-off energy loss per pulse	E_{off}					$T_j=25^{\circ}C$ $T_j=125^{\circ}C$		2,04 2,58		
Input capacitance	C_{ies}	f=1MHz	0	25		$T_j=25^{\circ}C$		4620		pF
Output capacitance	C_{oss}							288		
Reverse transfer capacitance	C_{rss}							137		
Gate charge	Q_{Gate}		± 15	480	75	$T_j=25^{\circ}C$		470		nC
Thermal resistance chip to heatsink per chip	R_{thJH}	Thermal grease thickness $\leq 50\mu m$ $\lambda = 1 W/mK$						0,86		K/W
Buck FWD										
Diode forward voltage	V_F				75	$T_j=25^{\circ}C$ $T_j=125^{\circ}C$	1,2	1,46 1,40	2,2	V
Peak reverse recovery current	I_{RRM}	Rgon=8 Ω	± 15	350	75	$T_j=25^{\circ}C$ $T_j=125^{\circ}C$		70 81		A
Reverse recovery time	t_{rr}					$T_j=25^{\circ}C$ $T_j=125^{\circ}C$		134 265		ns
Reverse recovered charge	Q_{rr}					$T_j=25^{\circ}C$ $T_j=125^{\circ}C$		3,22 6,01		μC
Peak rate of fall of recovery current	$di(rec)_{max}/dt$					$T_j=25^{\circ}C$ $T_j=125^{\circ}C$		5313 3017		A/ μs
Reverse recovered energy	E_{rec}					$T_j=25^{\circ}C$ $T_j=125^{\circ}C$		0,64 1,33		mWs
Thermal resistance chip to heatsink per chip	R_{thJH}	Thermal grease thickness $\leq 50\mu m$ $\lambda = 1 W/mK$						1,35		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 $I_b[A]$	T_j	Min	Typ	Max	

Boost IGBT

Gate emitter threshold voltage	V _{GE(th)}	V _{CE} =V _{GE}			0,0012	T _J =25°C T _J =125°C	5	5,8	6,5	V
Collector-emitter saturation voltage	V _{CE(sat)}		15		75	T _J =25°C T _J =125°C	1	1,58 1,83	2,1	V
Collector-emitter cut-off incl diode	I _{CES}		0	600		T _J =25°C T _J =125°C			30	μA
Gate-emitter leakage current	I _{GES}		20	0		T _J =25°C T _J =125°C			700	nA
Integrated Gate resistor	R _{gint}							none		Ω
Turn-on delay time	t _{d(on)}	R _{goff} =8 Ω R _{gon} =8 Ω	±15	350	75	T _J =25°C T _J =125°C		142 143		ns
Rise time	t _r					T _J =25°C T _J =125°C		21 24		
Turn-off delay time	t _{d(off)}					T _J =25°C T _J =125°C		206 227		
Fall time	t _f					T _J =25°C T _J =125°C		90 112		
Turn-on energy loss per pulse	E _{on}					T _J =25°C T _J =125°C		1,30 1,68	mWs	
Turn-off energy loss per pulse	E _{off}					T _J =25°C T _J =125°C		2,15 2,75		
Input capacitance	C _{ies}	f=1MHz	0	25		T _J =25°C		4620		pF
Output capacitance	C _{oss}							288		
Reverse transfer capacitance	C _{rss}							137		
Gate charge	Q _{Gate}		±15	480	75	T _J =25°C		470		nC
Thermal resistance chip to heatsink per chip	R _{thJH}	Thermal grease thickness≤50um λ = 1 W/mK						0,86		K/W

Buck and Boost Inverse FWD

Diode forward voltage	V_F				75	$T_j=25^{\circ}C$ $T_j=125^{\circ}C$	1,2	1,46 1,40	2,2	V
Thermal resistance chip to heatsink per chip	R_{thJH}	Thermal grease thickness $\leq 50\mu m$ $\lambda = 1\ W/mK$						1,35		K/W

Thermistor

Rated resistance	R					$T=25^{\circ}C$		22000		Ω
Deviation of R100	$\Delta R/R$	$R100=1486\ \Omega$				$T=100^{\circ}C$	-5		5	%
Power dissipation	P					$T=25^{\circ}C$		210		mW
Power dissipation constant						$T=25^{\circ}C$		3,5		mW/K
B-value	$B_{(25/50)}$	Tol. $\pm 3\%$				$T=25^{\circ}C$				K
B-value	$B_{(25/100)}$	Tol. $\pm 3\%$				$T=25^{\circ}C$		4000		K
Vincotech NTC Reference						$T=25^{\circ}C$			A	

Buck

Figure 1 IGBT

Typical output characteristics

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

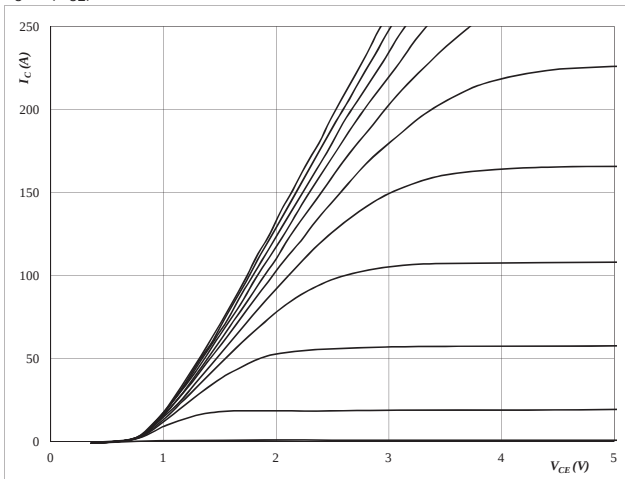

At
 $t_p = 350 \mu s$
 $T_J = 25^\circ C$
 V_{GE} from 7 V to 17 V in steps of 1 V

Figure 2 IGBT

Typical output characteristics

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

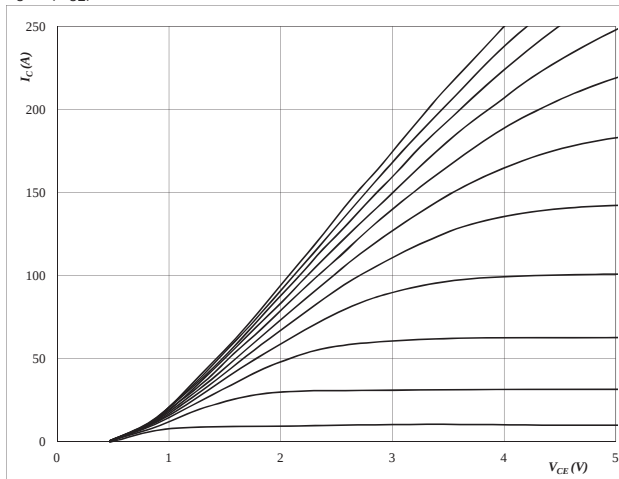
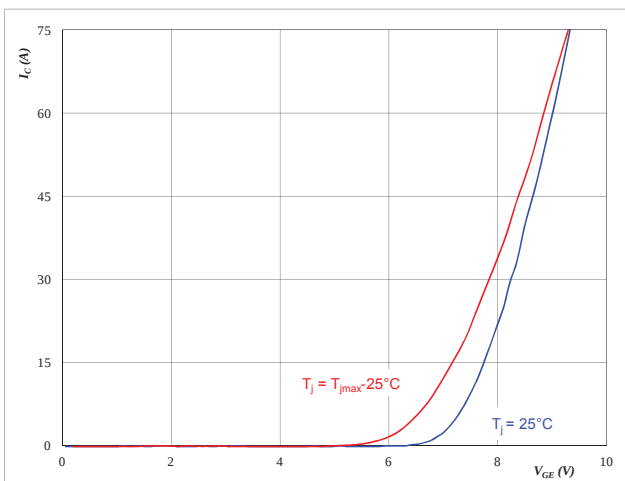

At
 $t_p = 350 \mu s$
 $T_J = 125^\circ C$
 V_{GE} from 7 V to 17 V in steps of 1 V

Figure 3 IGBT

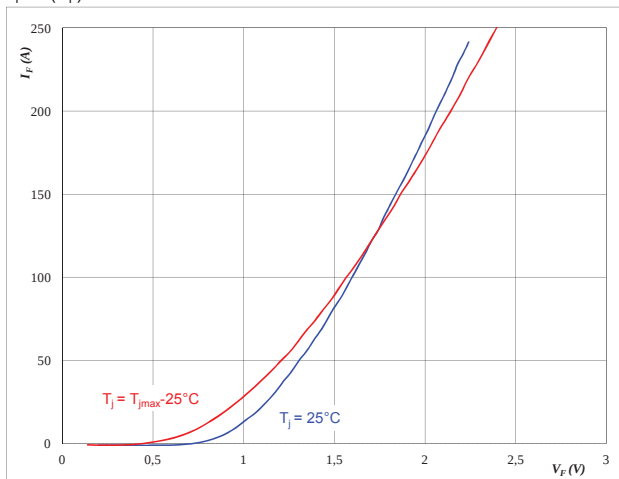
Typical transfer characteristics

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


At
 $t_p = 350 \mu s$
 $V_{CE} = 10 V$
Figure 4 FWD

Typical diode forward current as a function of forward voltage

$$I_F = f(V_F)$$

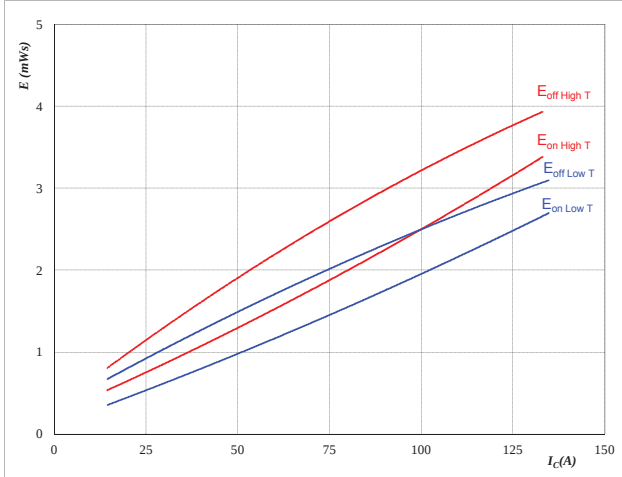

At
 $t_p = 350 \mu s$

Buck

Figure 5 IGBT

Typical switching energy losses
as a function of collector current

$$E = f(I_C)$$



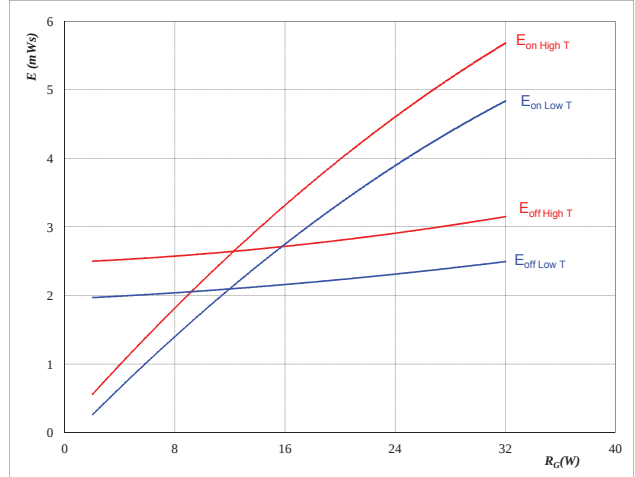
With an inductive load at

$T_J =$	25/125	°C
$V_{CE} =$	350	V
$V_{GE} =$	±15	V
$R_{gon} =$	8	Ω
$R_{goff} =$	8	Ω

Figure 6 IGBT

Typical switching energy losses
as a function of gate resistor

$$E = f(R_G)$$



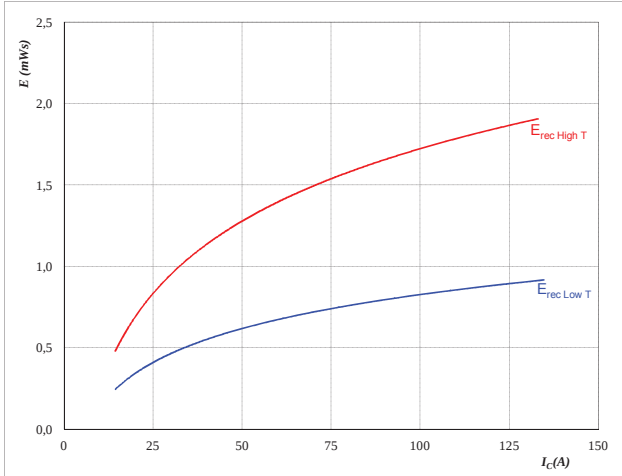
With an inductive load at

$T_J =$	25/125	°C
$V_{CE} =$	350	V
$V_{GE} =$	±15	V
$I_C =$	75	A

Figure 7 FWD

Typical reverse recovery energy loss
as a function of collector current

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



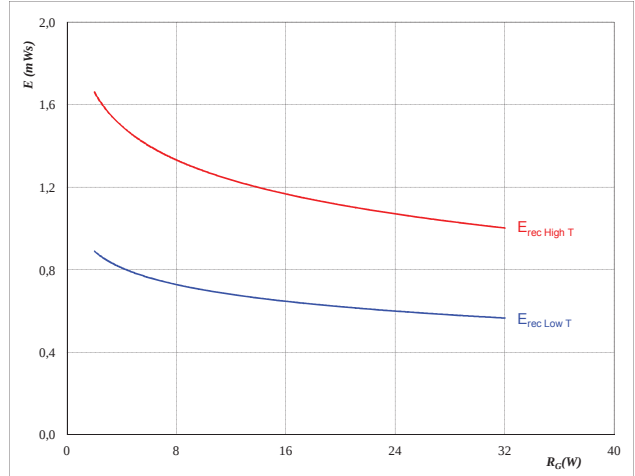
With an inductive load at

$T_J =$	25/125	°C
$V_{CE} =$	350	V
$V_{GE} =$	±15	V
$R_{gon} =$	8	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

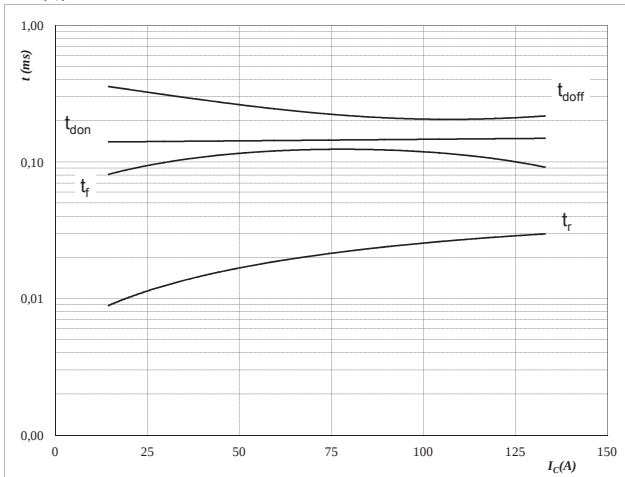
$T_J =$	25/125	°C
$V_{CE} =$	350	V
$V_{GE} =$	±15	V
$I_C =$	75	A

Buck

Figure 9 IGBT

Typical switching times as a function of collector current

$$t = f(I_C)$$



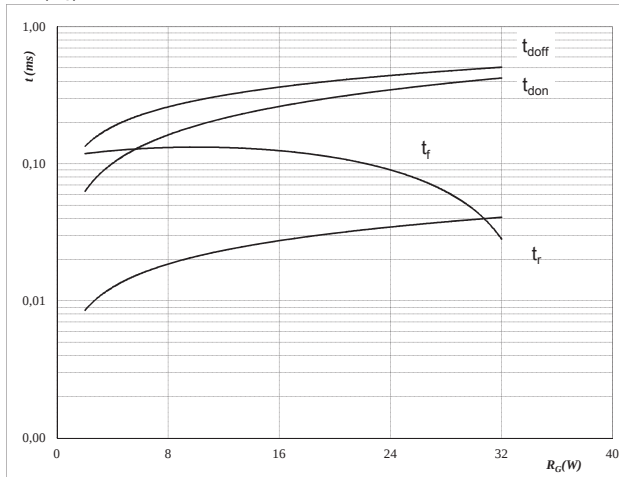
With an inductive load at

$T_J =$	125	°C
$V_{CE} =$	350	V
$V_{GE} =$	±15	V
$R_{gon} =$	8	Ω
$R_{goff} =$	8	Ω

Figure 10 IGBT

Typical switching times as a function of gate resistor

$$t = f(R_G)$$



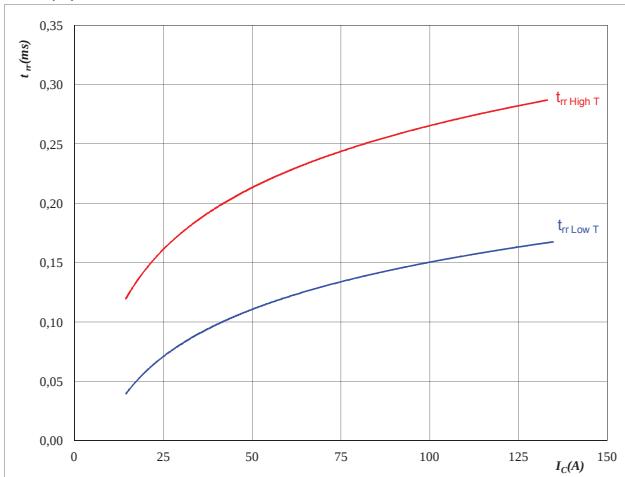
With an inductive load at

$T_J =$	125	°C
$V_{CE} =$	350	V
$V_{GE} =$	±15	V
$I_C =$	75	A

Figure 11 FWD

Typical reverse recovery time as a function of collector current

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



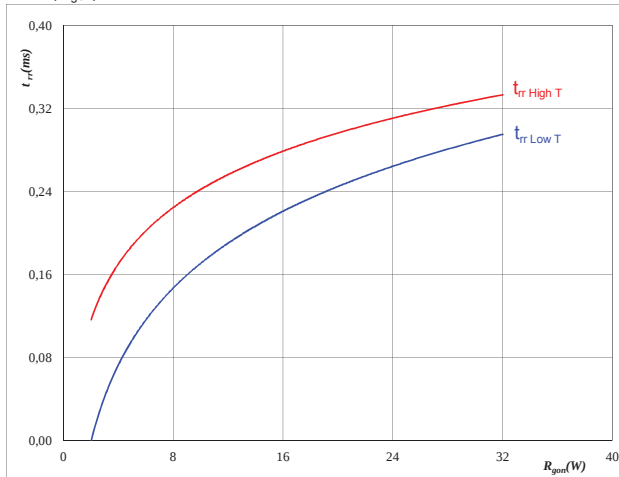
At

$T_J =$	25/125	°C
$V_{CE} =$	350	V
$V_{GE} =$	±15	V
$R_{gon} =$	8	Ω

Figure 12 FWD

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

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



At

$T_J =$	25/125	°C
$V_R =$	350	V
$I_F =$	75	A
$V_{GE} =$	±15	V

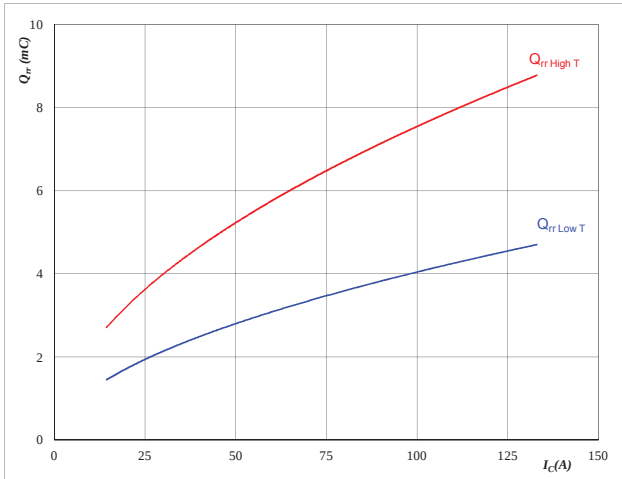
Buck

Figure 13

FWD

Typical reverse recovery charge as a function of collector current

$$Q_{rr} = f(I_C)$$



At

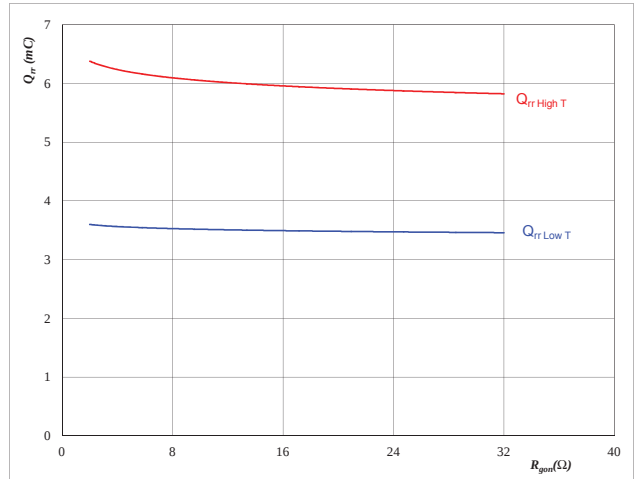
$T_J =$	25/125	°C
$V_{CE} =$	350	V
$V_{GE} =$	±15	V
$R_{gon} =$	8	Ω

Figure 14

FWD

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

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



At

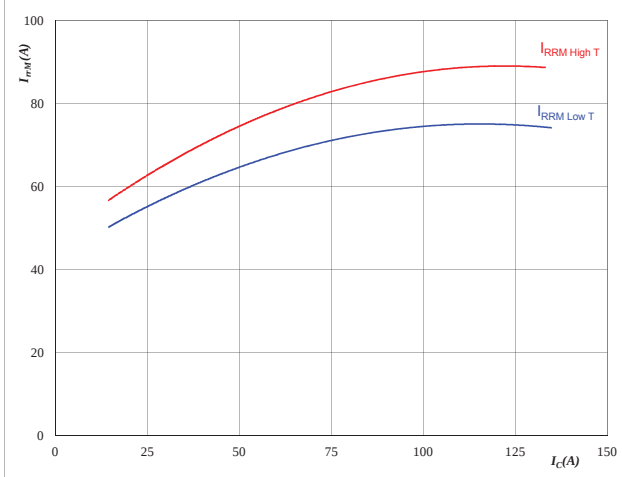
$T_J =$	25/125	°C
$V_R =$	350	V
$I_F =$	75	A
$V_{GE} =$	±15	V

Figure 15

FWD

Typical reverse recovery current as a function of collector current

$$I_{RRM} = f(I_C)$$



At

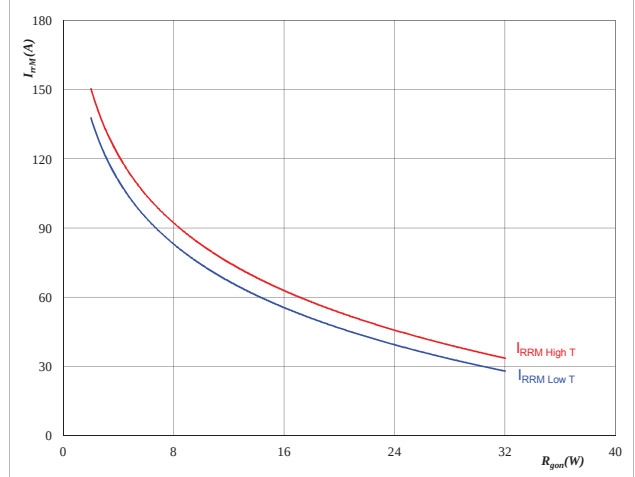
$T_J =$	25/125	°C
$V_{CE} =$	350	V
$V_{GE} =$	±15	V
$R_{gon} =$	8	Ω

Figure 16

FWD

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

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



At

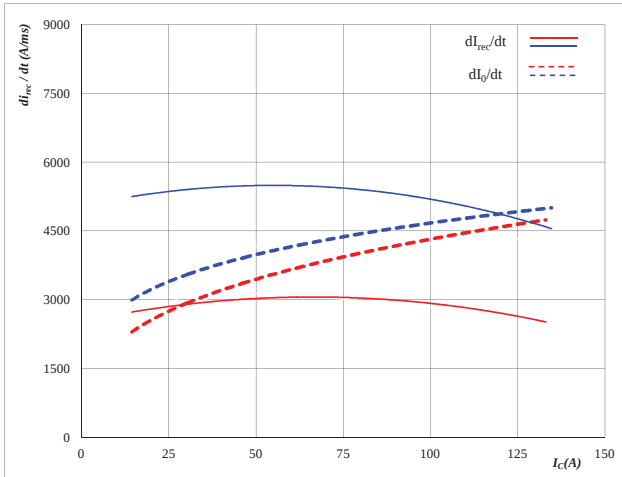
$T_J =$	25/125	°C
$V_R =$	350	V
$I_F =$	75	A
$V_{GE} =$	±15	V

Buck

Figure 17 FWD

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

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



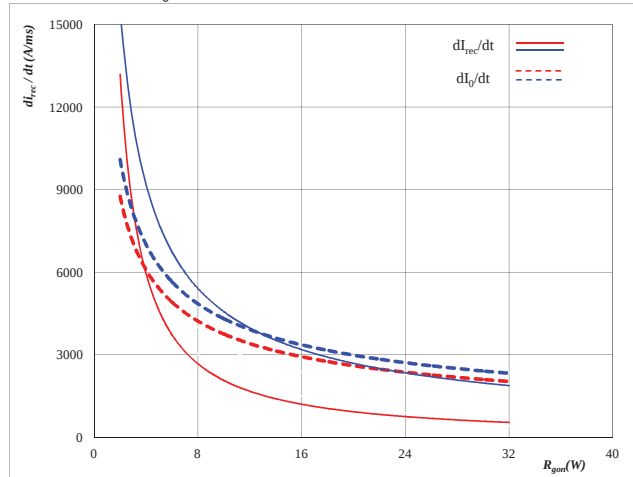
At

$T_J =$	25/125	°C
$V_{CE} =$	350	V
$V_{GE} =$	±15	V
$R_{gon} =$	8	Ω

Figure 18 FWD

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

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



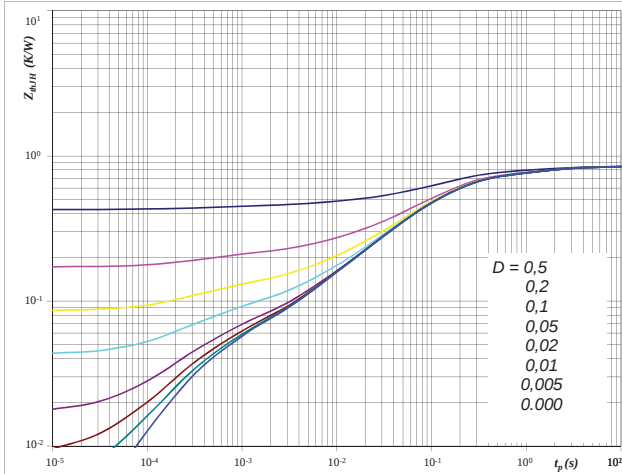
At

$T_J =$	25/125	°C
$V_R =$	350	V
$I_F =$	75	A
$V_{GE} =$	±15	V

Figure 19 IGBT

IGBT transient thermal impedance
as a function of pulse width

$$Z_{thJH} = f(t_p)$$



At

$D =$	t_p / T	
$R_{thJH} =$	0,86	K/W

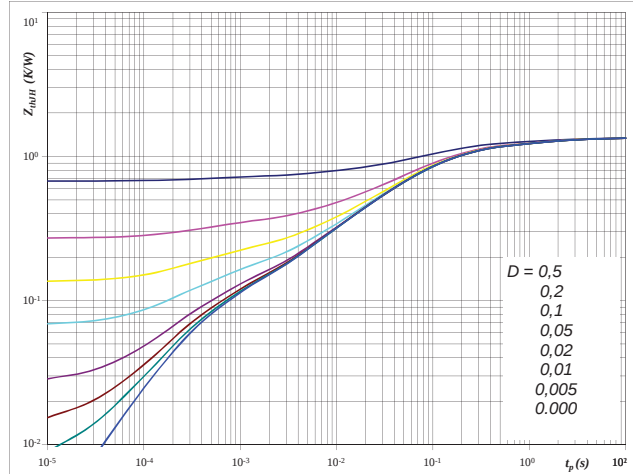
IGBT thermal model values

R (C/W)	Tau (s)
0,03	8,8E+00
0,14	1,3E+00
0,43	1,4E-01
0,17	3,3E-02
0,05	4,4E-03
0,04	3,3E-04

Figure 20 FWD

FWD transient thermal impedance
as a function of pulse width

$$Z_{thJH} = f(t_p)$$



At

$D =$	t_p / T	
$R_{thJH} =$	1,35	K/W

FWD thermal model values

R (C/W)	Tau (s)
0,04	9,0E+00
0,20	1,2E+00
0,54	1,4E-01
0,39	3,3E-02
0,11	4,8E-03
0,08	3,4E-04

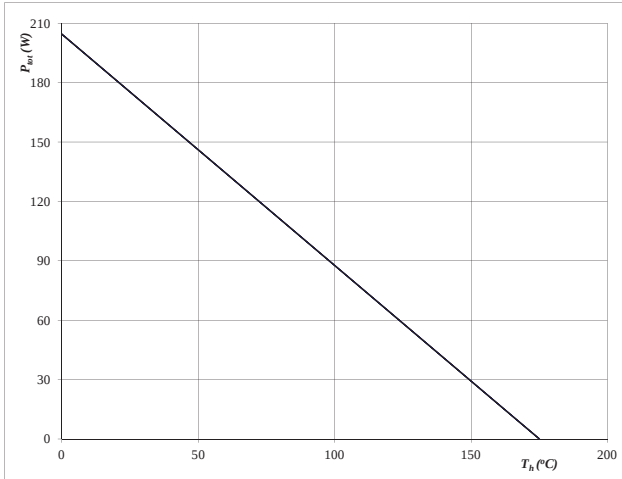
Buck

Figure 21

IGBT

Power dissipation as a function of heatsink temperature

$$P_{\text{tot}} = f(T_h)$$



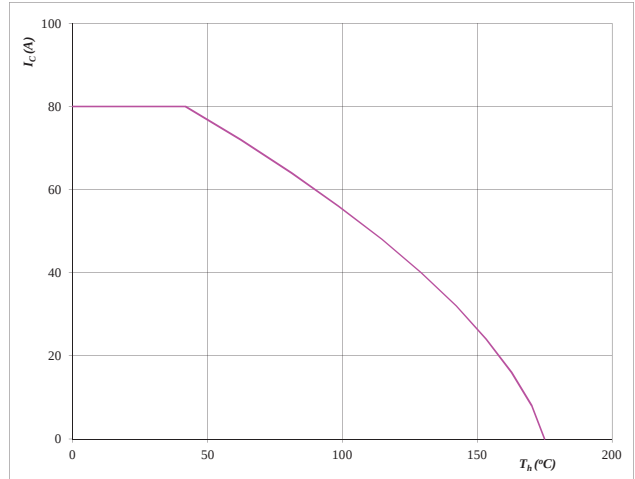
At
 $T_J = 175$ °C

Figure 22

IGBT

Collector current as a function of heatsink temperature

$$I_C = f(T_h)$$



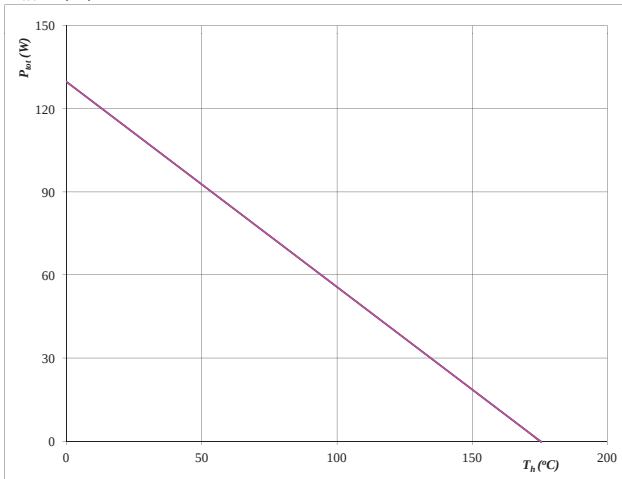
At
 $T_J = 175$ °C
 $V_{GE} = 15$ V

Figure 23

FWD

Power dissipation as a function of heatsink temperature

$$P_{\text{tot}} = f(T_h)$$



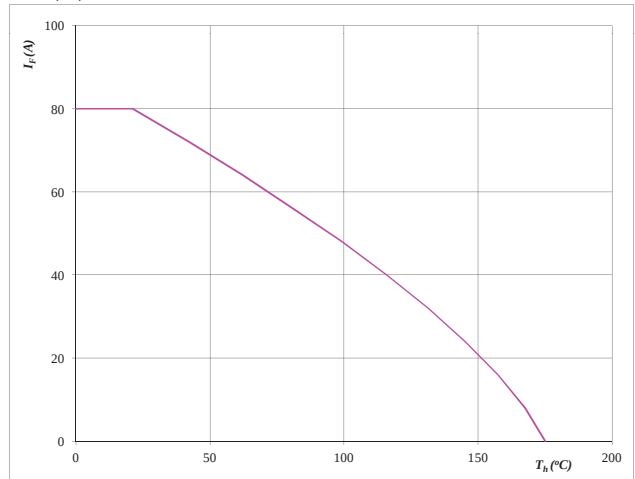
At
 $T_J = 175$ °C

Figure 24

FWD

Forward current as a function of heatsink temperature

$$I_F = f(T_h)$$



At
 $T_J = 175$ °C

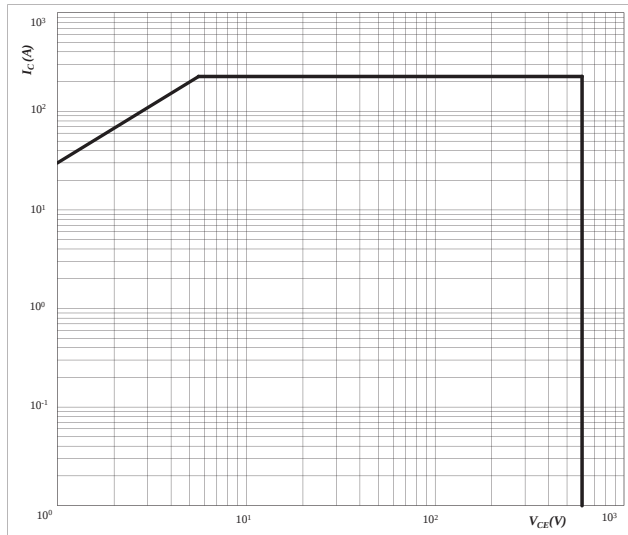
Buck & Boost

Figure 25

IGBT

Turn on safe operating area as a function
of collector-emitter voltage

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



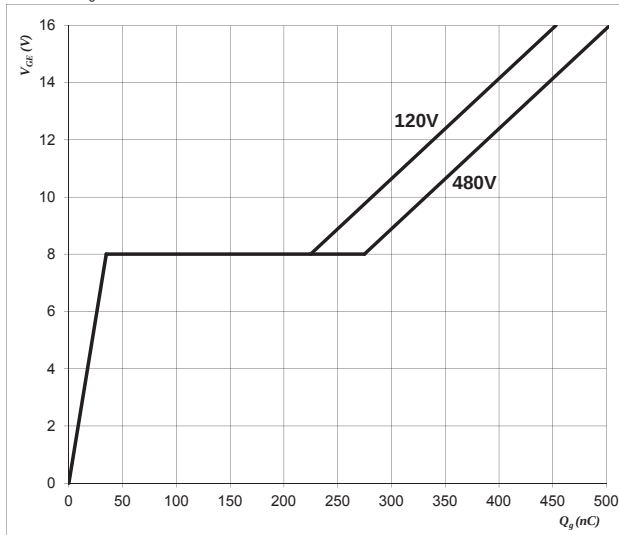
At

 $T_J =$
 T_{Jmax}
 $^{\circ}C$
Figure 26

IGBT

Gate voltage vs Gate charge

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



At

 $I_C =$

75

A

Boost

Figure 1 IGBT

Typical output characteristics

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

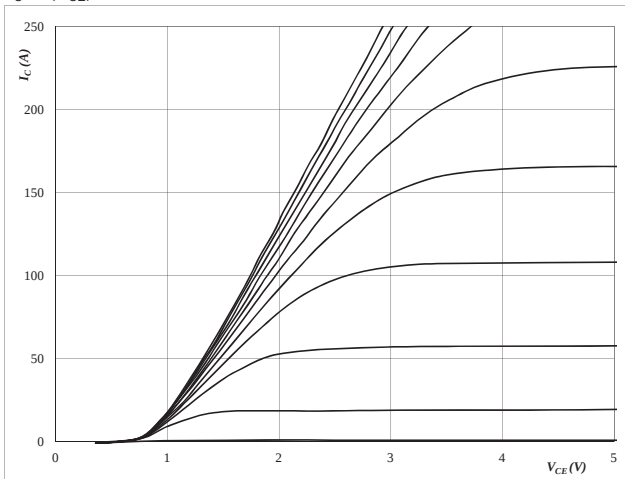

At
 $t_p = 250 \mu s$
 $T_J = 25 ^\circ C$
 V_{GE} from 7 V to 17 V in steps of 1 V

Figure 2 IGBT

Typical output characteristics

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

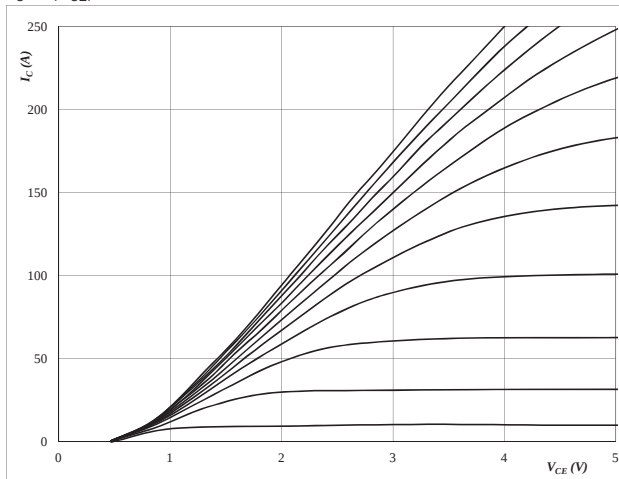
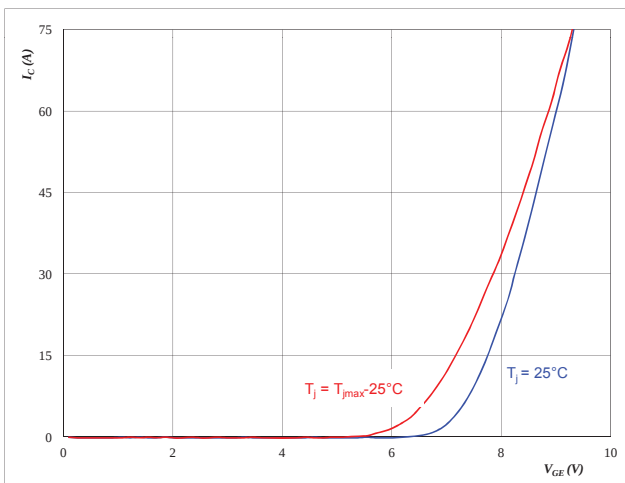

At
 $t_p = 250 \mu s$
 $T_J = 125 ^\circ C$
 V_{GE} from 7 V to 17 V in steps of 1 V

Figure 3 IGBT

Typical transfer characteristics

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

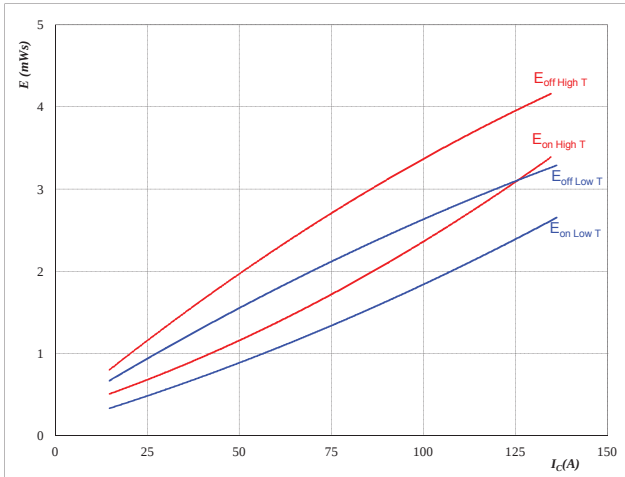

At
 $t_p = 250 \mu s$
 $V_{CE} = 10 V$

Boost

Figure 4 IGBT

Typical switching energy losses
as a function of collector current

$$E = f(I_C)$$



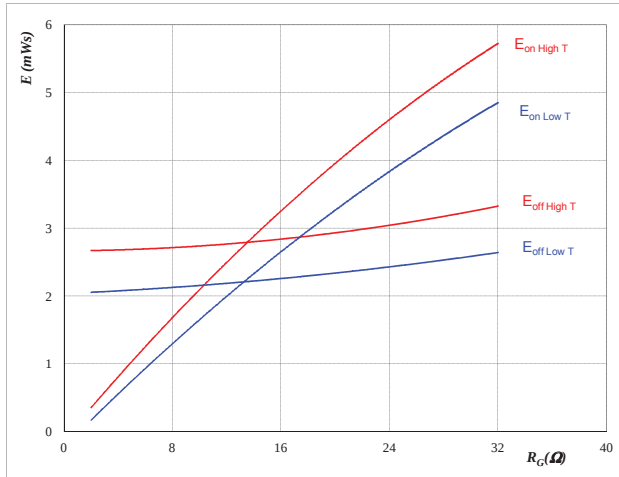
With an inductive load at

$T_J =$	25/125	°C
$V_{CE} =$	350	V
$V_{GE} =$	±15	V
$R_{gon} =$	8	Ω
$R_{goff} =$	8	Ω

Figure 5 IGBT

Typical switching energy losses
as a function of gate resistor

$$E = f(R_G)$$



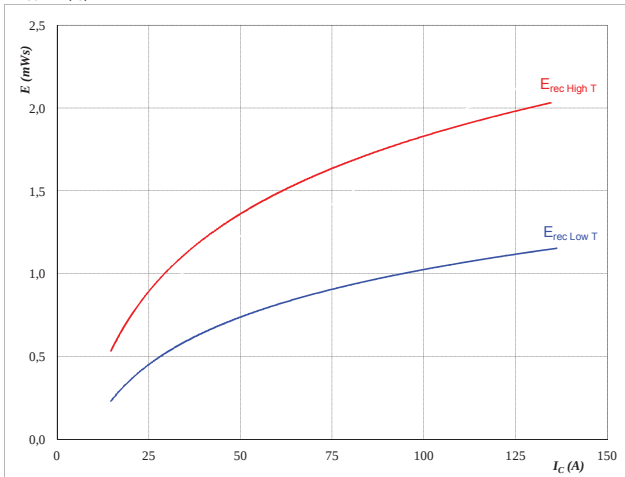
With an inductive load at

$T_J =$	25/125	°C
$V_{CE} =$	350	V
$V_{GE} =$	±15	V
$I_C =$	75	A

Figure 6 IGBT

Typical reverse recovery energy loss
as a function of collector current

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



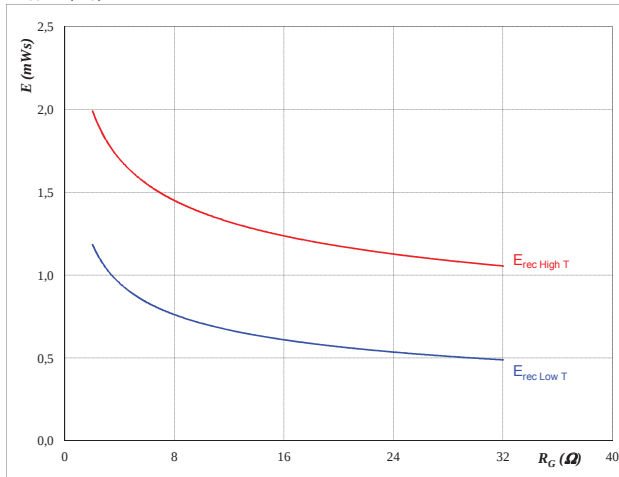
With an inductive load at

$T_J =$	25/125	°C
$V_{CE} =$	350	V
$V_{GE} =$	±15	V
$R_{gon} =$	8	Ω

Figure 7 IGBT

Typical reverse recovery energy loss
as a function of gate resistor

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



With an inductive load at

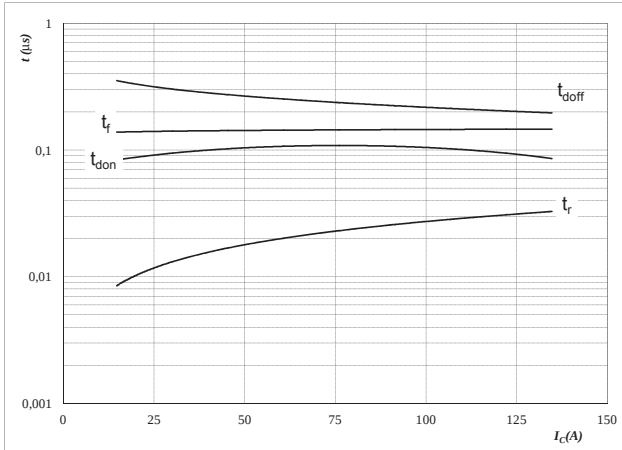
$T_J =$	25/125	°C
$V_{CE} =$	350	V
$V_{GE} =$	±15	V
$I_C =$	75	A

Boost

Figure 8 IGBT

Typical switching times as a function of collector current

$$t = f(I_C)$$



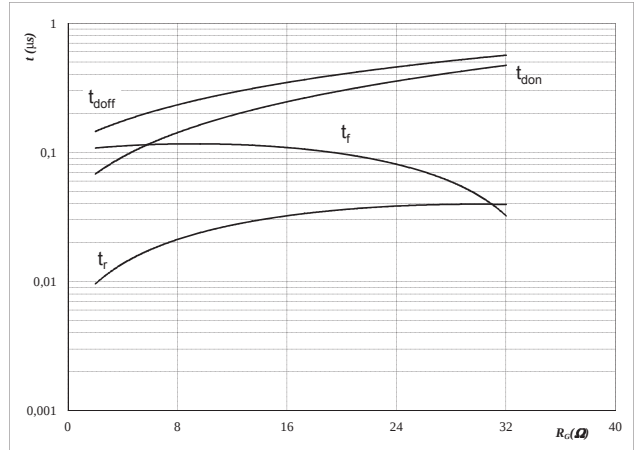
With an inductive load at

$T_J =$	125	°C
$V_{CE} =$	350	V
$V_{GE} =$	±15	V
$R_{gon} =$	8	Ω
$R_{goff} =$	8	Ω

Figure 9 IGBT

Typical switching times as a function of gate resistor

$$t = f(R_G)$$



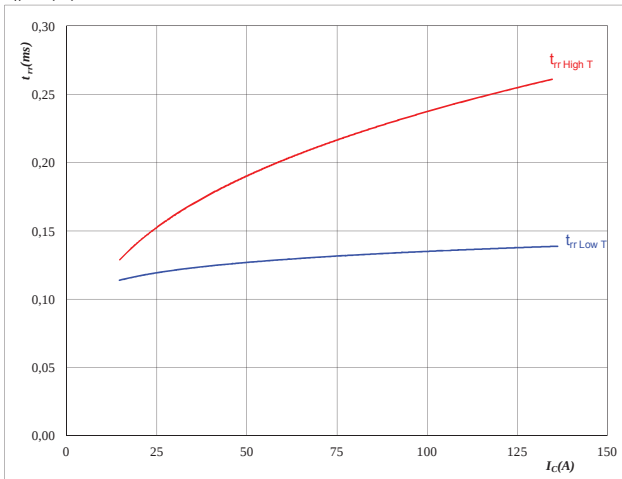
With an inductive load at

$T_J =$	125	°C
$V_{CE} =$	350	V
$V_{GE} =$	±15	V
$I_C =$	75	A

Figure 10 FWD

Typical reverse recovery time as a function of collector current

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



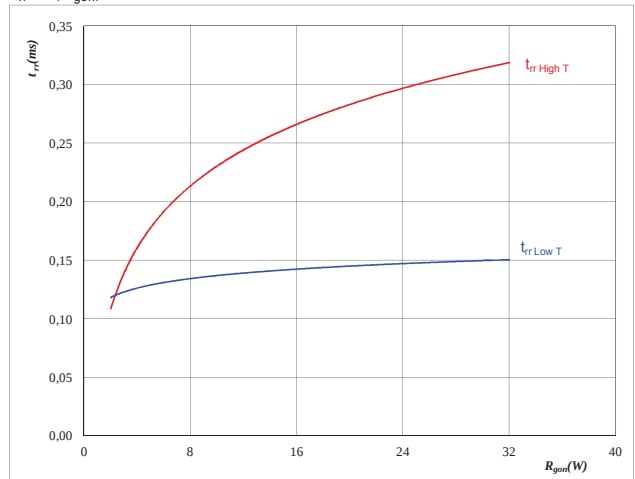
At

$T_J =$	25/125	°C
$V_{CE} =$	350	V
$V_{GE} =$	±15	V
$R_{gon} =$	8	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
$V_R =$	350	V
$I_F =$	75	A
$V_{GE} =$	±15	V

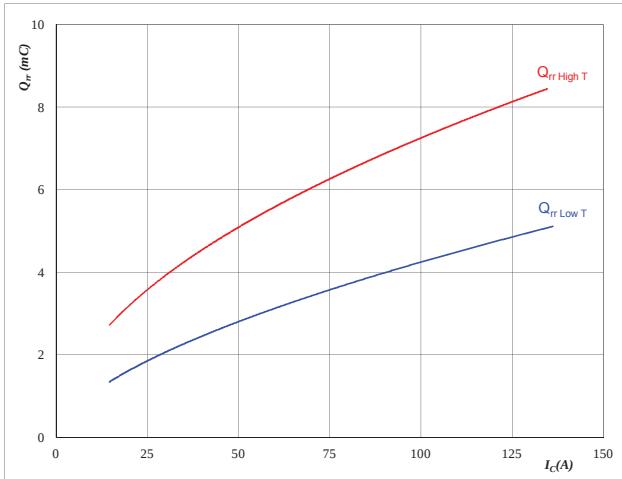
Boost

Figure 12

FWD

Typical reverse recovery charge as a function of collector current

$$Q_{rr} = f(I_c)$$



At

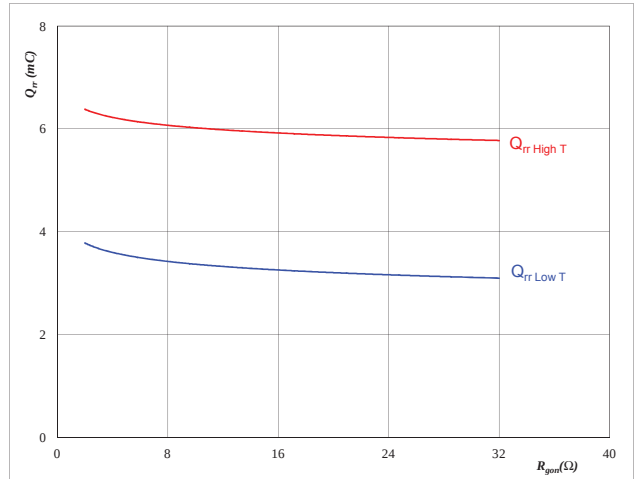
$T_j =$	25/125	°C
$V_{CE} =$	350	V
$V_{GE} =$	±15	V
$R_{gon} =$	8	Ω

Figure 13

FWD

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

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



At

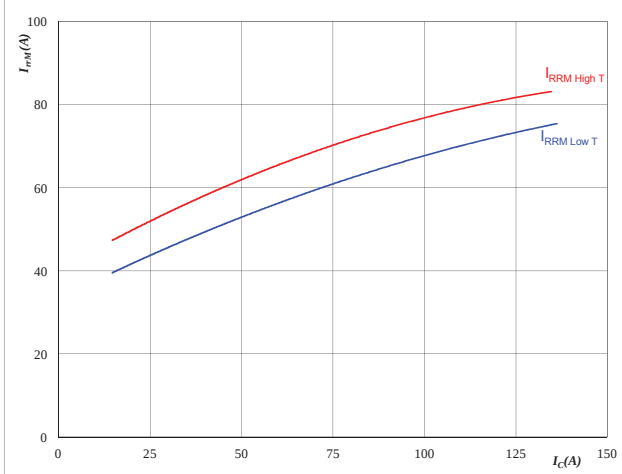
$T_j =$	25/125	°C
$V_R =$	350	V
$I_F =$	75	A
$V_{GE} =$	±15	V

Figure 14

FWD

Typical reverse recovery current as a function of collector current

$$I_{RRM} = f(I_c)$$



At

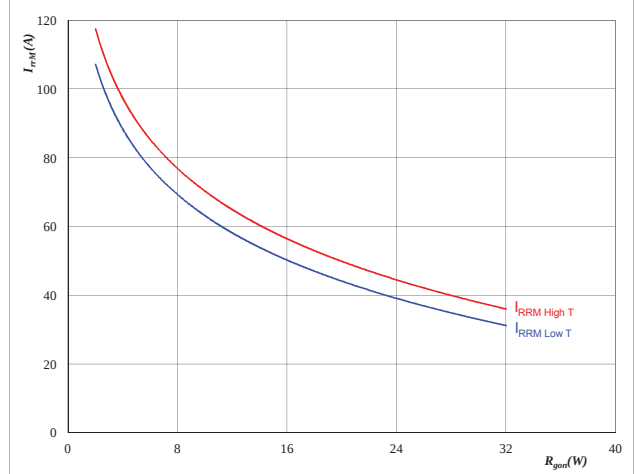
$T_j =$	25/125	°C
$V_{CE} =$	350	V
$V_{GE} =$	±15	V
$R_{gon} =$	8	Ω

Figure 15

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
$V_R =$	350	V
$I_F =$	75	A
$V_{GE} =$	±15	V

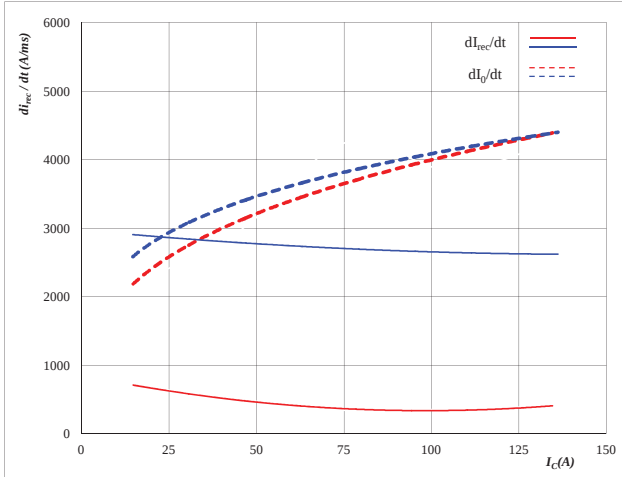
Boost

Figure 16

FWD

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

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



At

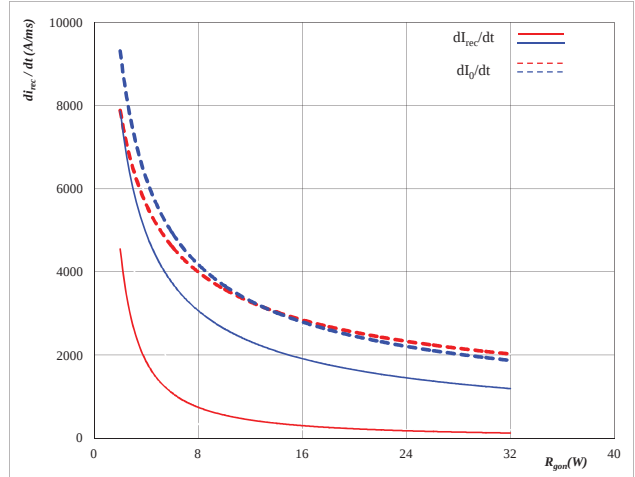
$T_J =$	25/125	°C
$V_{CE} =$	350	V
$V_{GE} =$	±15	V
$R_{gon} =$	8	Ω

Figure 17

FWD

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

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



At

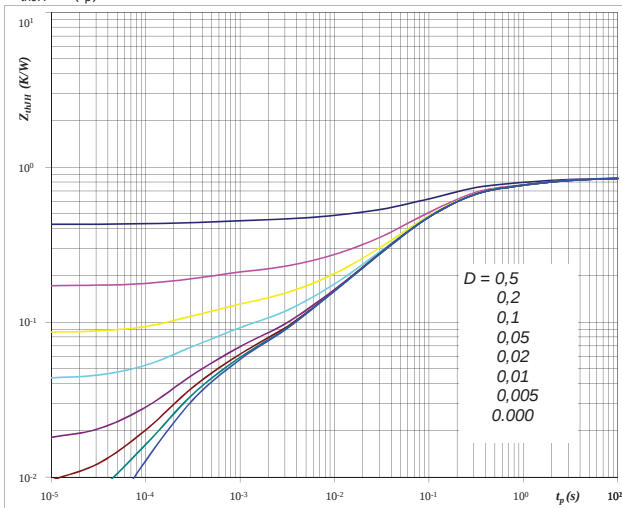
$T_J =$	25/125	°C
$V_R =$	350	V
$I_F =$	75	A
$V_{GE} =$	±15	V

Figure 18

IGBT

IGBT transient thermal impedance
as a function of pulse width

$$Z_{thJH} = f(t_p)$$



At

$D =$	t_p / T	
$R_{thJH} =$	0,86	K/W

R (C/W)	Tau (s)
0,03	8,8E+00
0,14	1,3E+00
0,43	1,4E-01
0,17	3,3E-02
0,05	4,4E-03
0,04	3,3E-04

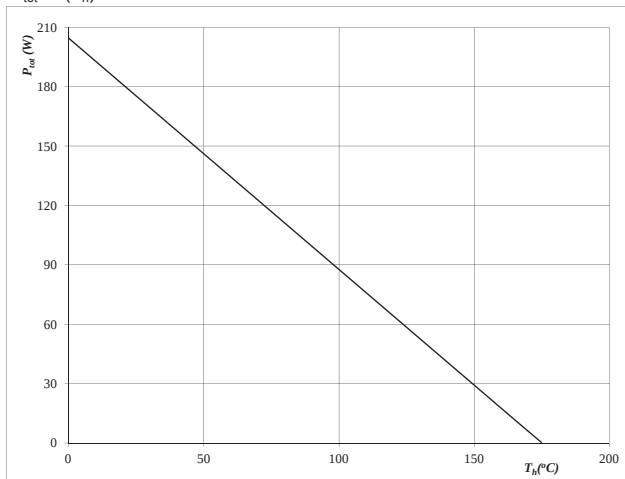
Boost

Figure 19

IGBT

Power dissipation as a function of heatsink temperature

$$P_{\text{tot}} = f(T_h)$$



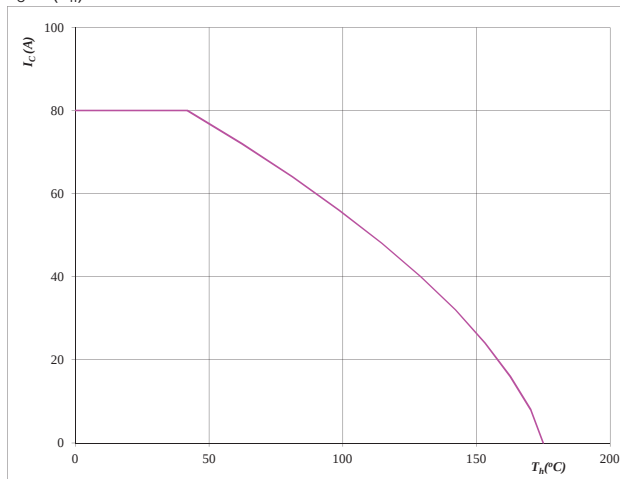
At
 $T_j = 175$ °C

Figure 20

IGBT

Collector current as a function of heatsink temperature

$$I_C = f(T_h)$$



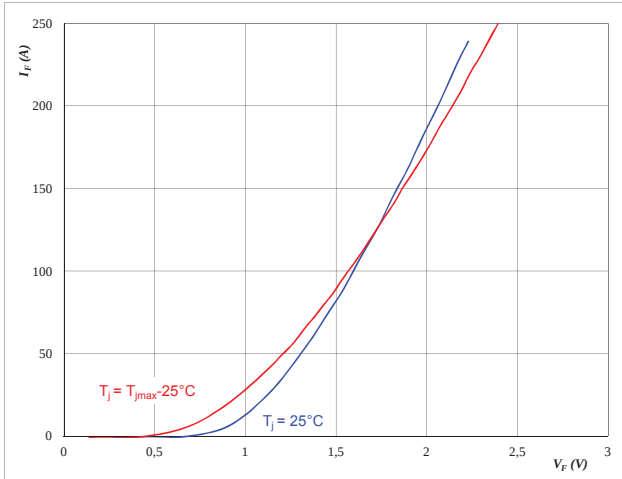
At
 $T_j = 175$ °C
 $V_{GE} = 15$ V

Buck and Boost Inverse Diode

Figure 1 Buck and Boost Inverse Diode

Typical diode forward current as a function of forward voltage

$$I_F = f(V_F)$$

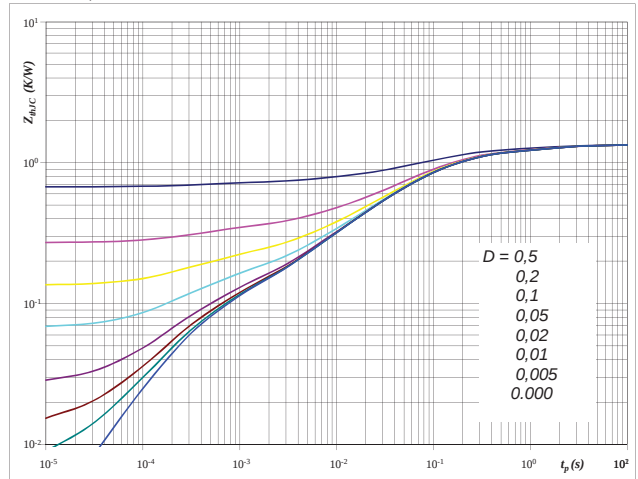


At
 $t_p = 350 \mu s$

Figure 2 Buck and Boost Inverse Diode

Diode transient thermal impedance as a function of pulse width

$$Z_{thJH} = f(t_p)$$

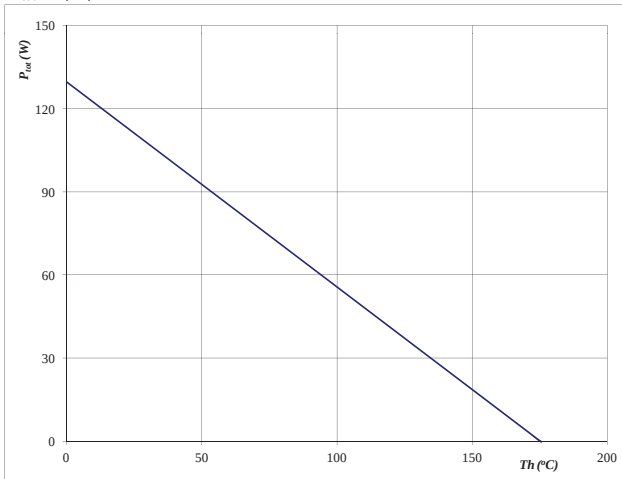


At
 $D = t_p / T$
 $R_{thJH} = 1,35 K/W$

Figure 3 Buck and Boost Inverse Diode

Power dissipation as a function of heatsink temperature

$$P_{tot} = f(T_h)$$

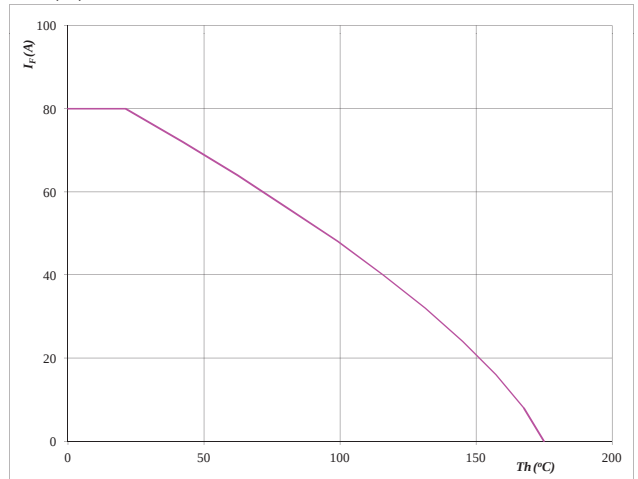


At
 $T_j = 175 ^\circ C$

Figure 4 Buck and Boost Inverse Diode

Forward current as a function of heatsink temperature

$$I_F = f(T_h)$$



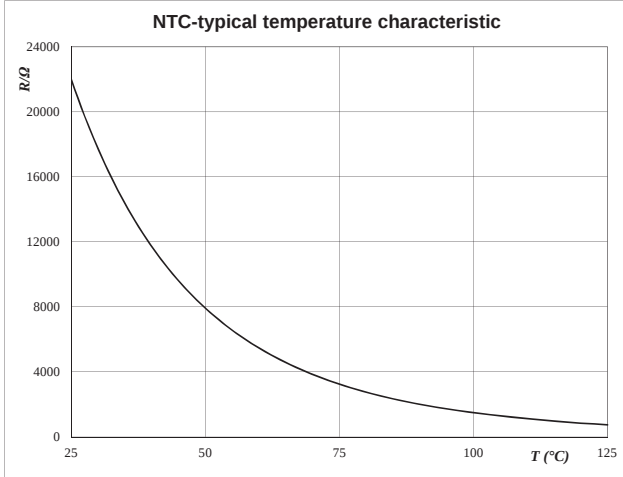
At
 $T_j = 175 ^\circ C$

Thermistor

Figure 1 Thermistor

Typical NTC characteristic
 as a function of temperature

$R_T = f(T)$


Figure 2 Thermistor

Typical NTC resistance values

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

T [°C]	R _{nom} [Ω]	R _{min} [Ω]	R _{max} [Ω]	ΔR/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

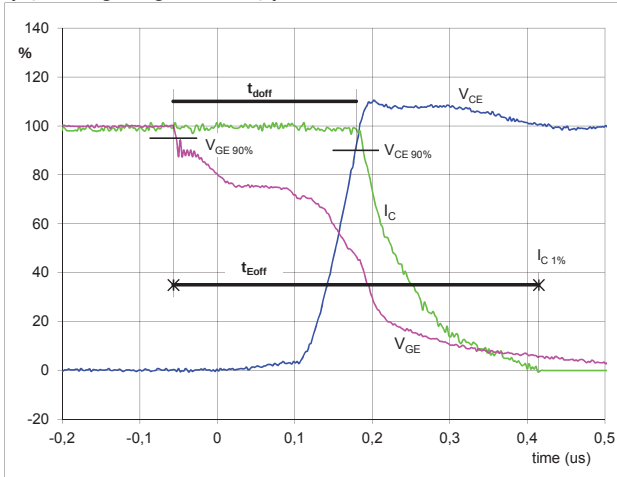
Switching Definitions BUCK IGBT

General conditions

T_j	=	125 °C
R_{gon}	=	8 Ω
R_{goff}	=	8 Ω

Figure 1 Output inverter IGBT

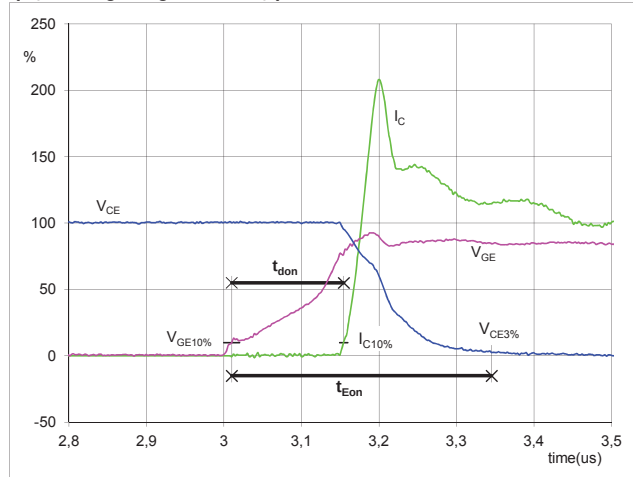
Turn-off Switching Waveforms & definition of t_{doff} , t_{Eoff}
 (t_{Eoff} = integrating time for E_{off})



$V_{GE}(0\%) =$	-15	V
$V_{GE}(100\%) =$	15	V
$V_C(100\%) =$	700	V
$I_C(100\%) =$	75	A
$t_{doff} =$	0,23	μs
$t_{Eoff} =$	0,47	μs

Figure 2 Output inverter IGBT

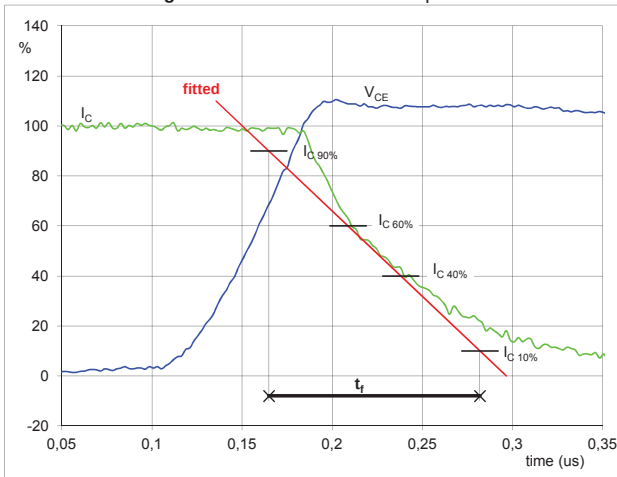
Turn-on Switching Waveforms & definition of t_{don} , t_{Eon}
 (t_{Eon} = integrating time for E_{on})



$V_{GE}(0\%) =$	-15	V
$V_{GE}(100\%) =$	15	V
$V_C(100\%) =$	700	V
$I_C(100\%) =$	75	A
$t_{don} =$	0,15	μs
$t_{Eon} =$	0,34	μs

Figure 3 Output inverter IGBT

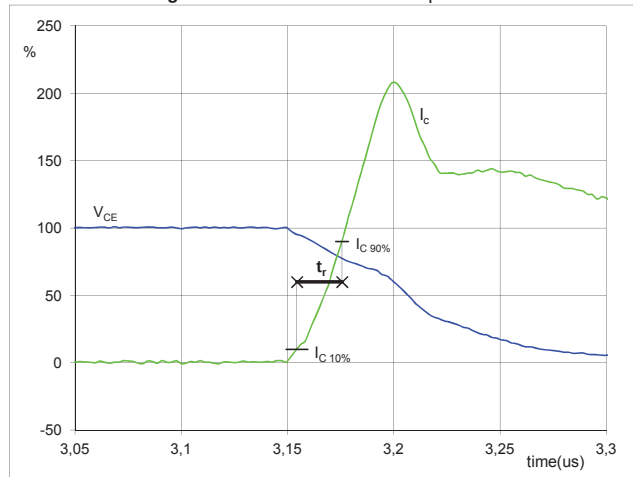
Turn-off Switching Waveforms & definition of t_f



$V_C(100\%) =$	700	V
$I_C(100\%) =$	75	A
$t_f =$	0,12	μs

Figure 4 Output inverter IGBT

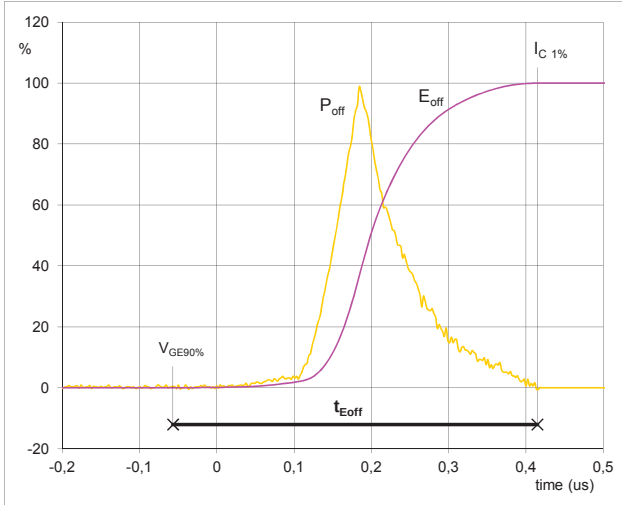
Turn-on Switching Waveforms & definition of t_r



$V_C(100\%) =$	700	V
$I_C(100\%) =$	75	A
$t_r =$	0,02	μs

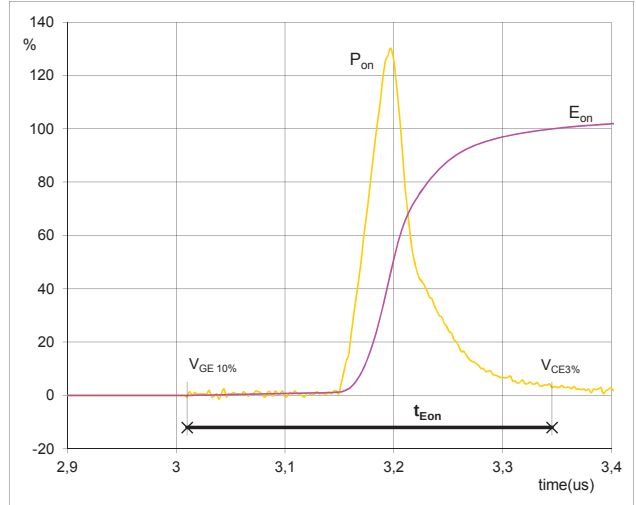
Switching Definitions BUCK IGBT

Figure 5 Output inverter IGBT
Turn-off Switching Waveforms & definition of t_{Eoff}



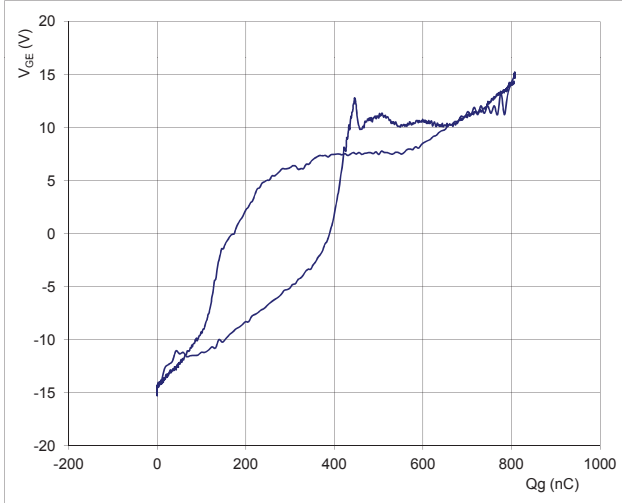
$P_{off}(100\%) =$	52,15	kW
$E_{off}(100\%) =$	2,58	mJ
$t_{Eoff} =$	0,47	μs

Figure 6 Output inverter IGBT
Turn-on Switching Waveforms & definition of t_{Eon}



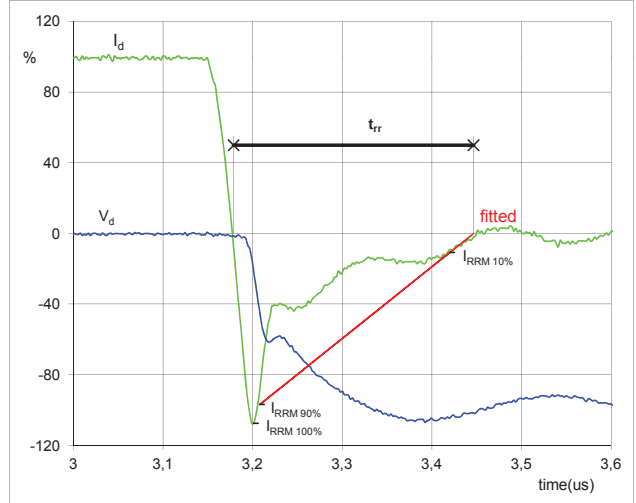
$P_{on}(100\%) =$	52,15	kW
$E_{on}(100\%) =$	1,88	mJ
$t_{Eon} =$	0,34	μs

Figure 7 Output inverter FWD
Gate voltage vs Gate charge (measured)



$V_{GEoff} =$	-15	V
$V_{GEon} =$	15	V
$V_C(100\%) =$	700	V
$I_C(100\%) =$	75	A
$Q_g =$	808,15	nC

Figure 8 Output inverter IGBT
Turn-off Switching Waveforms & definition of t_{rr}



$V_d(100\%) =$	700	V
$I_d(100\%) =$	75	A
$I_{RRM}(100\%) =$	-81	A
$t_{rr} =$	0,27	μs

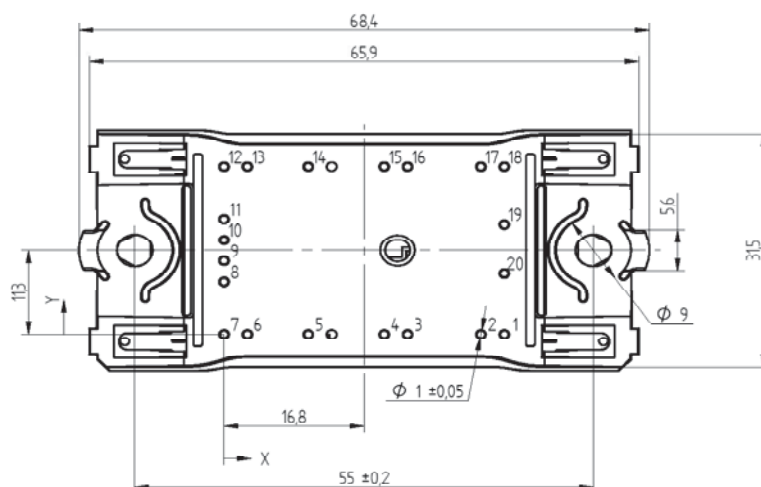
Ordering Code and Marking - Outline - Pinout

Ordering Code & Marking

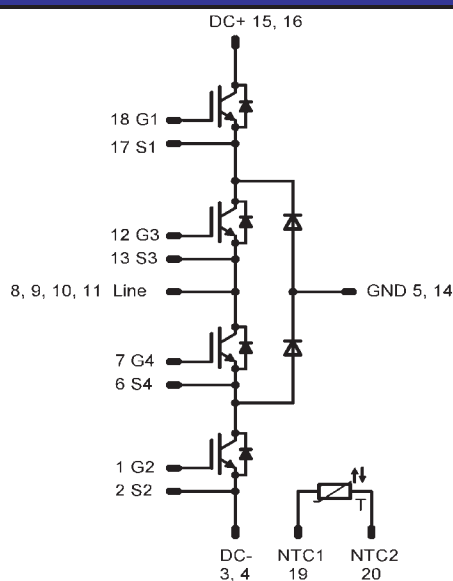
Version	Ordering Code	in DataMatrix as	in packaging barcode as
Standard in flow0 12mm housing	10-FZ06NIA075SA-P926F33	P926F33	P926F33

Outline

Pin table		
Pin	X	Y
1	33,6	0
2	30,8	0
3	22	0
4	19,2	0
5	10,1	0
6	2,8	0
7	0	0
8	0	7,1
9	0	9,9
10	0	12,7
11	0	15,5
12	0	22,6
13	2,8	22,6
14	10,1	22,6
15	19,2	22,6
16	22	22,6
17	30,8	22,6
18	33,6	22,6
19	33,6	14,8
20	33,6	8,2



Pinout



PRODUCT STATUS DEFINITIONS

Datasheet Status	Product Status	Definition
Target	Formative or In Design	This datasheet contains the design specifications for product development. Specifications may change in any manner without notice. The data contained is exclusively intended for technically trained staff.
Preliminary	First Production	This datasheet contains preliminary data, and supplementary data may be published at a later date. Vincotech reserves the right to make changes at any time without notice in order to improve design. The data contained is exclusively intended for technically trained staff.
Final	Full Production	This datasheet contains final specifications. Vincotech reserves the right to make changes at any time without notice in order to improve design. The data contained is exclusively intended for technically trained staff.

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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.