Vincotech

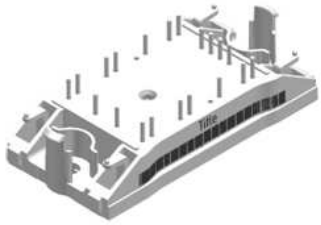
10-FZ07NIA060SM-P926F43
datasheet

flow NPC 0 — 650 V / 60 A

Features

- High Efficiency three-level half-bridge
- High efficiency IGBT
- Neutral point-Clamped inverter
- Clip-In PCB mounting
- Low Inductance Layout

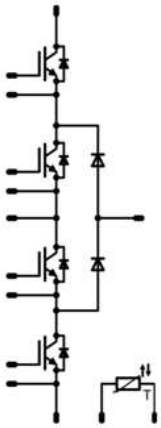
flow 0 12mm housing



Target applications

- Solar
- UPS

Schematic



Types

- 10-FZ07NIA060SM-P926F43

Maximum Ratings

T_j=25°C, unless otherwise specified

Parameter	Symbol	Condition		Value	Unit
Buck Switch\ Out. Boost Switch					
Collector-emitter voltage	V_{CES}			650	V
Collector current	I_C	$T_j = T_j$max	T_S=80 °C	53	A
Repetitive peak collector current	I_{CRM}	t_p limited by $T_j$max		180	A
Total power dissipation	P_{tot}	$T_j = T_j$max	T_S=80 °C	97	W
Gate-emitter voltage	V_{GES}			±20	V
Maximum Junction Temperature	T_{jmax}			175	°C

Parameter	Symbol	Conditions		Value	Unit
Buck Diode\ Out. Boost Diode					
Peak Repetitive Reverse Voltage	V_{RRM}			650	V
Continuous (direct) forward current	I_F	$T_j=T_{jmax}$	T_h=80°C	45	A
Surge (non-repetitive) forward current	I_{FSM}	50Hz Single Half Sine Wave		500	A
Total power dissipation	P_{tot}	$T_j=T_{jmax}$	T_h=80°C	76	W
Maximum Junction Temperature	T_{jmax}			175	°C

Parameter	Symbol	Conditions		Value	Unit
Out. Boost Inv. Diode					
Peak Repetitive Reverse Voltage	V_{RRM}			650	V
Continuous (direct) forward current	I_F	$T_j=T_{jmax}$	T_h=80°C	65	A
Repetitive peak forward current	I_{FRM}			150	A
Total power dissipation	P_{tot}	$T_j=T_{jmax}$	T_h=80°C	85	W
Maximum Junction Temperature	T_{jmax}			175	°C

Module Properties

Parameter	Symbol	Conditions		Value	Unit
Thermal Properties					
Storage temperature	T_{stg}			-40...+125	°C
Operation Junction Temperature	T_{jop}			-40...+(T_{jmax} - 25)	°C
Isolation Properties					
Isolation voltage	V_{isol}	DC voltage	t_p=2s	4000	V
Creepage distance				min 12,7	mm
Clearance				min 9,75	mm
Comparative Tracking Index	CTI			>200	

Characteristic Values

Buck Switch

Parameter	Symbol	Conditions					Value			Unit
			V_{GE} [V]	V_{CE} [V]	I_C [A]	T_j [°C]	Min	Typ	Max	
Static										
Gate-emitter threshold voltage	$V_{GE(th)}$	$V_{GE}=V_{CE}$			0,0006	25 125	3,3	4	4,7	V
Collector-emitter saturation voltage	V_{CEsat}		15		60	25 125 150		1,67 1,80 1,84	2,22	V
Collector-emitter cut-off current	I_{CES}		0	650		25 125			40	µA
Gate-emitter leakage current	I_{GES}		20	0		25 125			120	nA
Internal gate resistance	r_g							none		Ω
Input capacitance	C_{ies}	f=1 MHz	0	25		25		2100		pF
Reverse transfer capacitance	C_{res}							7,7		
Thermal										
Thermal resistance junction to sink	$R_{th(j-s)}$	Phase-Change Material λ=3,4W/mK						0,98		K/W
IGBT Switching										
Turn-on delay time	$t_{d(on)}$	R_{goff} = 16 Ω R_{gon} = 16 Ω	±15	350	60	25 125 150		115 117 117		ns
Rise time	t_r					25 125 150		18 19 20		
Turn-off delay time	$t_{d(off)}$					25 125 150		95 108 111		
Fall time	t_f					25 125 150		5 8 9		
Turn-on energy (per pulse)	E_{on}	Q_{rFWD} = 0,7 µC Q_{rFWD} = 2,1 µC Q_{rFWD} = 2,5 µC				25 125 150		1,128 1,485 1,571		mWs
Turn-off energy (per pulse)	E_{off}					25 125 150		0,220 0,415 0,465		

Buck Diode

Parameter	Symbol	Conditions					Value			Unit
				V_r [V]	I_F [A]	T_j [°C]	Min	Typ	Max	
Static										
Forward voltage	V_F				50	25 125 150		2,30 1,94 1,86	2,6	V
Reverse leakage current	I_r			665		25 150			10 -	µA
Thermal										
Thermal resistance junction to sink	$R_{th(j-s)}$	Phase-Change Material λ=3,4W/mK						1,25		K/W
FWD Switching										
Peak recovery current	I_{RRM}	di/dt = 2943 A/µs di/dt = 2875 A/µs di/dt = 2730 A/µs	±15	350	60	25 125 150		23 32 36		A
Reverse recovery time	t_{rr}					25 125 150		30 124 140		ns
Recovered charge	Q_r					25 125 150		0,692 2,065 2,511		µC
Reverse recovered energy	E_{rec}					25 125 150		0,097 0,340 0,422		mWs
Peak rate of fall of recovery current	$(di_{rf}/dt)_{max}$					25 125 150		2675 480 691		A/µs

Out. Boost Switch

Parameter	Symbol	Conditions					Value			Unit
			V_{GE} [V]	V_{CE} [V]	I_C [A]	T_j [°C]	Min	Typ	Max	
Static										
Gate-emitter threshold voltage	$V_{GE(th)}$	$V_{GE}=V_{CE}$			0,0006	25 125	3,3	4	4,7	V
Collector-emitter saturation voltage	V_{CEsat}		15		60	25 125 150		1,67 1,80 1,84	2,22	V
Collector-emitter cut-off current	I_{CES}		0	650		25 125			40	µA
Gate-emitter leakage current	I_{GES}		20	0		25 125			120	nA
Internal gate resistance	r_g							none		Ω
Input capacitance	C_{ies}	f=1 MHz	0	25		25		2100		pF
Reverse transfer capacitance	C_{res}							7,7		
Thermal										
Thermal resistance junction to sink	$R_{th(j-s)}$	Phase-Change Material λ=3,4W/mK						0,98		K/W
IGBT Switching										
Turn-on delay time	$t_{d(on)}$	R_{goff} = 16 Ω R_{gon} = 16 Ω	±15	350	60	25 125 150		119 118 119		ns
Rise time	t_r					25 125 150		17 20 21		
Turn-off delay time	$t_{d(off)}$					25 125 150		99 112 115		
Fall time	t_f					25 125 150		5 11 14		
Turn-on energy (per pulse)	E_{on}	Q_{rFWD} = 0,7 µC Q_{rFWD} = 2,1 µC Q_{rFWD} = 2,6 µC				25 125 150		1,133 1,453 1,543		mWs
Turn-off energy (per pulse)	E_{off}					25 125 150		0,271 0,490 0,549		

Out. Boost Diode

Parameter	Symbol	Conditions					Value			Unit
				V_r [V]	I_F [A]	T_j [°C]	Min	Typ	Max	
Static										
Forward voltage	V_F				50	25 125 150		2,30 1,94 1,86	2,6	V
Reverse leakage current	I_r			665		25 150			10 -	µA
Thermal										
Thermal resistance junction to sink	$R_{th(j-s)}$	Phase-Change Material λ=3,4W/mK						1,25		K/W
FWD Switching										
Peak recovery current	I_{RRM}	di/dt = 3120 A/µs di/dt = 2136 A/µs di/dt = 2000 A/µs	±15	350	60	25 125 150		24 34 37		A
Reverse recovery time	t_{rr}					25 125 150		87 119 130		ns
Recovered charge	Q_r					25 125 150		0,701 2,072 2,592		µC
Reverse recovered energy	E_{rec}					25 125 150		0,107 0,371 0,488		mWs
Peak rate of fall of recovery current	$(di_{rf}/dt)_{max}$					25 125 150		2742 398 488		A/µs

Out. Boost Inv. Diode

Parameter	Symbol	Conditions					Value			Unit
				V_r [V]	I_F [A]	T_j [°C]	Min	Typ	Max	
Static										
Forward voltage	V_F				75	25 125 150		1,46 1,42 1,40	1,9	V
Reverse leakage current	I_r			650		25 150			27 -	µA
Thermal										
Thermal resistance junction to sink	$R_{th(j-s)}$	Phase-Change Material λ=3,4W/mK						1,12		K/W

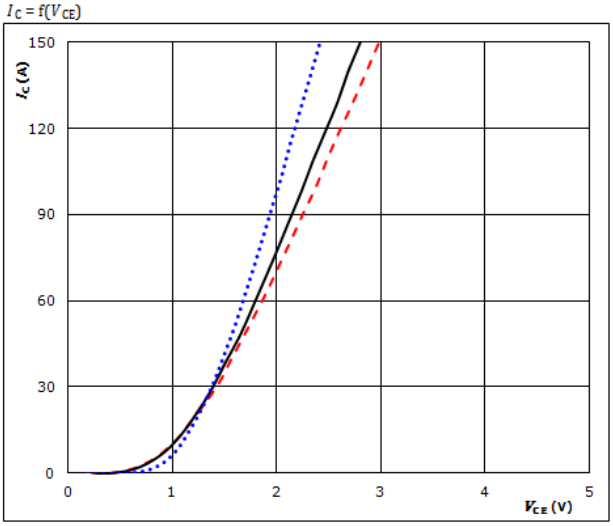
Thermistor

Parameter	Symbol	Conditions					Value			Unit
			V_{GE} [V]	V_{CE} [V]	I_C [A]	T_j [°C]	Min	Typ	Max	
Rated resistance	R					25		21,5		kΩ
Deviation of R100	$\Delta_{R/R}$	R100=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	$B_{(25/100)}$					25		3964		K
Vincotech NTC Reference									F	

Buck Switch\Out. Boost Switch Characteristics

Typical output characteristics IGBT

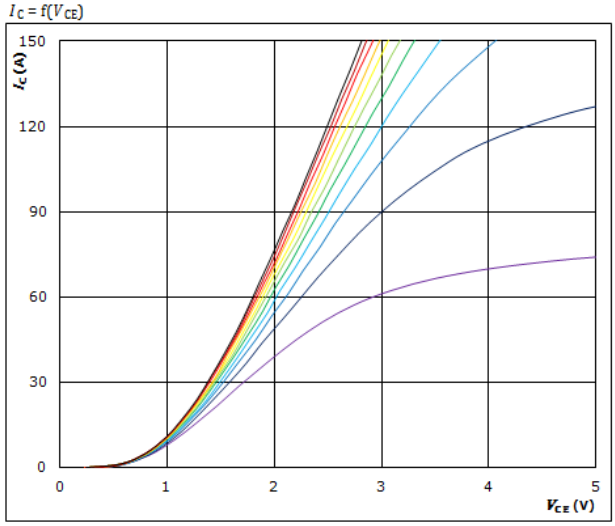
$I_C = f(V_{CE})$



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

Typical output characteristics IGBT

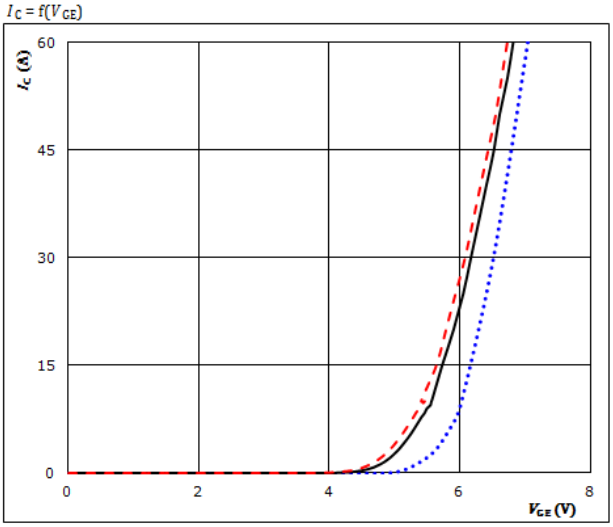
$I_C = f(V_{CE})$



t_p =	250	µs
T_j =	150	°C
V_{GE} from	7 V to 17 V in steps of 1 V	

Typical transfer characteristics IGBT

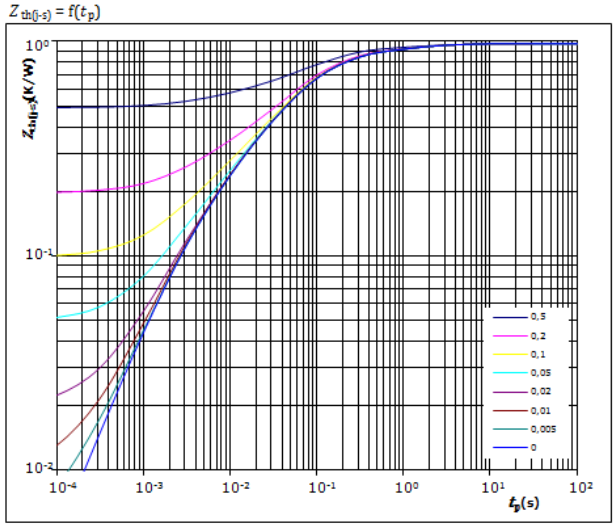
$I_C = f(V_{CE})$



t_p =	100	µs	25 °C
V_{CE} =	10	V	125 °C
			150 °C

Transient Thermal Impedance as function of Pulse duration IGBT

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



D =	t_p / T	
$R_{th(j-s)}$ =	0,98	K/W

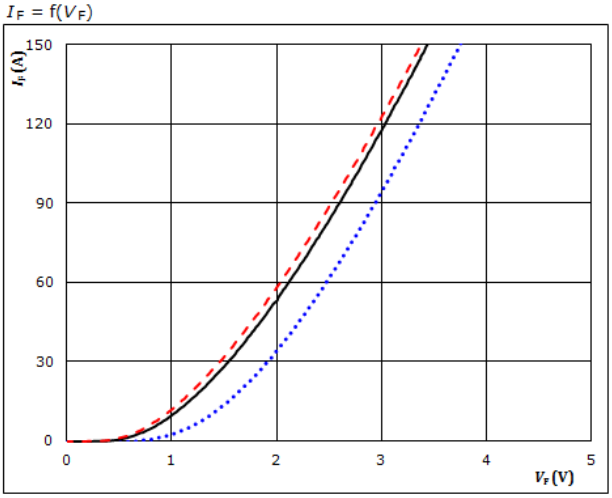
IGBT thermal model values

R_{th} (K/W)	τ (s)
9,94E-02	1,63E+00
1,95E-01	2,13E-01
4,61E-01	6,06E-02
1,53E-01	1,16E-02
6,97E-02	2,58E-03

Buck Diode\Out. Boost Diode Characteristics

Typical forward characteristics **FWD**

$I_F = f(V_F)$

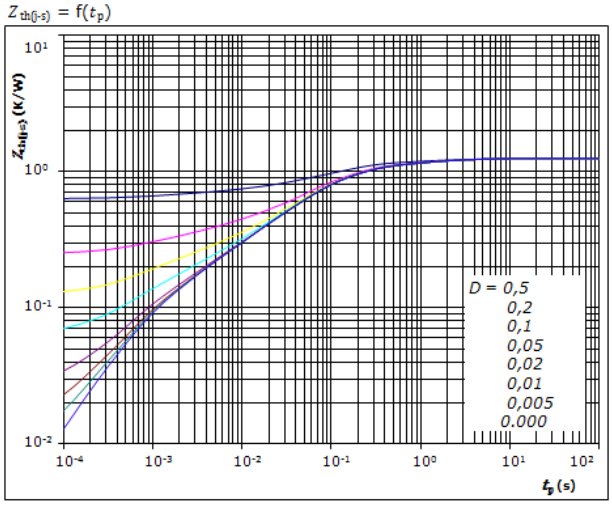


t_p = 250 µs

T_j: 25 °C, 125 °C, 150 °C

Transient thermal impedance as a function of pulse width **FWD**

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



D = t_p / T

$R_{th(j-s)}$ = 1,25 K/W

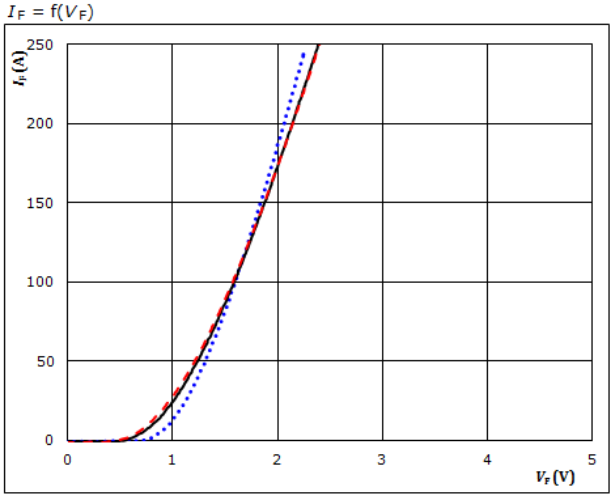
FWD thermal model values

R (K/W)	τ (s)
8,28E-02	3,17E+00
1,76E-01	6,05E-01
5,29E-01	1,07E-01
2,56E-01	3,44E-02
1,19E-01	6,15E-03
8,99E-02	8,86E-04

Out. Boost Inv. Diode Characteristics

Typical forward characteristics **FWD**

$I_F = f(V_F)$

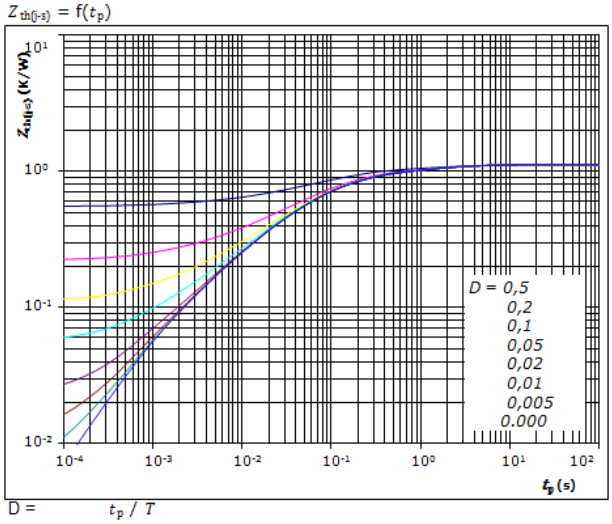


t_p = 250 µs

T_j: 25 °C, 125 °C, 150 °C

Transient thermal impedance as a function of pulse width **FWD**

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



D = t_p / T

$R_{th(j-s)}$ = 1,12 K/W

FWD thermal model values

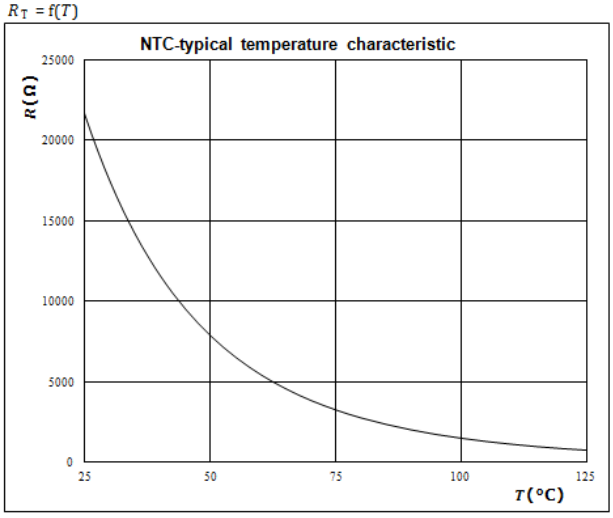
R (K/W)	τ (s)
6,88E-02	4,09E+00
1,60E-01	8,43E-01
3,68E-01	1,30E-01
3,14E-01	4,09E-02
1,57E-01	8,78E-03
4,73E-02	1,11E-03

Thermistor Characteristics

Thermistor typical temperature characteristic

Typical NTC characteristic as a function of temperature

$R_T = f(T)$

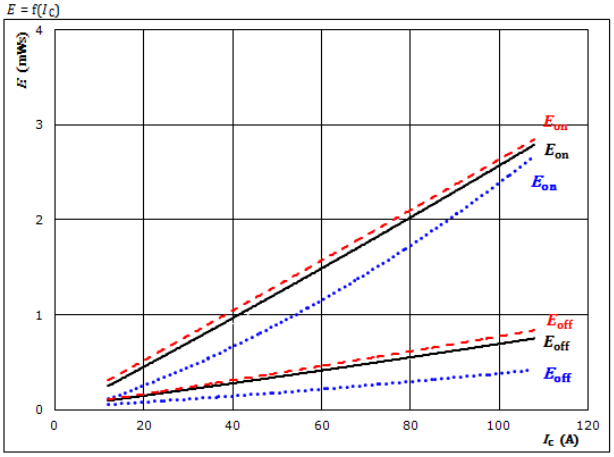


Buck Switching Characteristics

Figure 1. IGBT

Typical switching energy losses as a function of collector current

$E = f(I_C)$



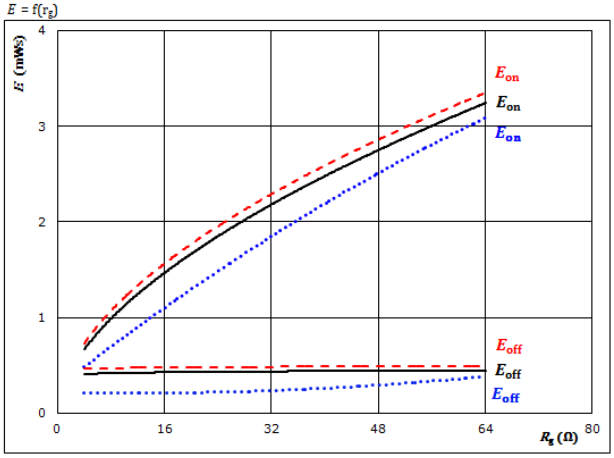
With an inductive load at

V_{CE} =	350	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
R_{gon} =	16	Ω		150 °C
R_{goff} =	16	Ω		

Figure 2. IGBT

Typical switching energy losses as a function of gate resistor

$E = f(r_g)$



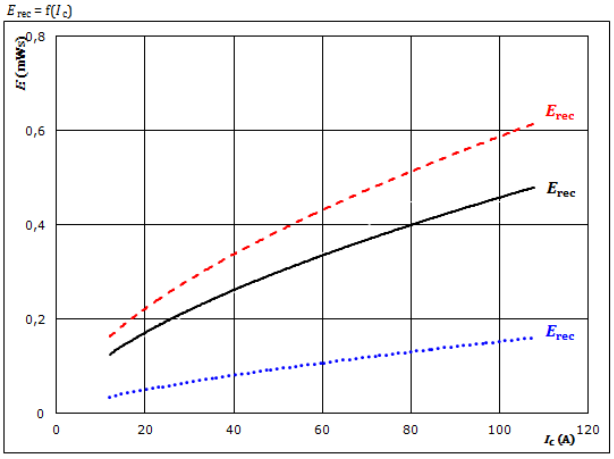
With an inductive load at

V_{CE} =	350	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
I_C =	60	A		150 °C

Figure 3. FWD

Typical reverse recovered energy loss as a function of collector current

$E_{rec} = f(I_c)$



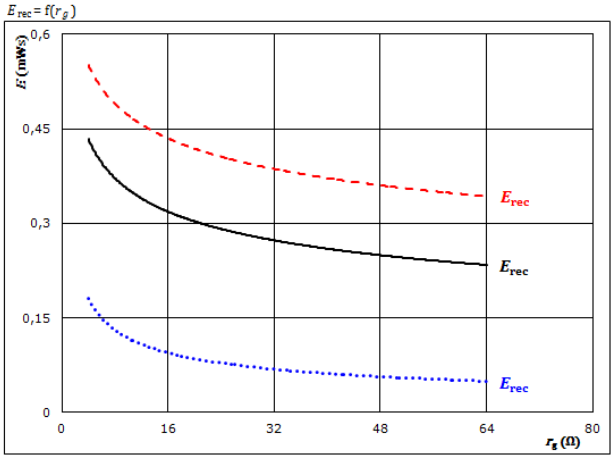
With an inductive load at

V_{CE} =	350	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
R_{gon} =	16	Ω		150 °C

Figure 4. FWD

Typical reverse recovered energy loss as a function of gate resistor

$E_{rec} = f(r_g)$



With an inductive load at

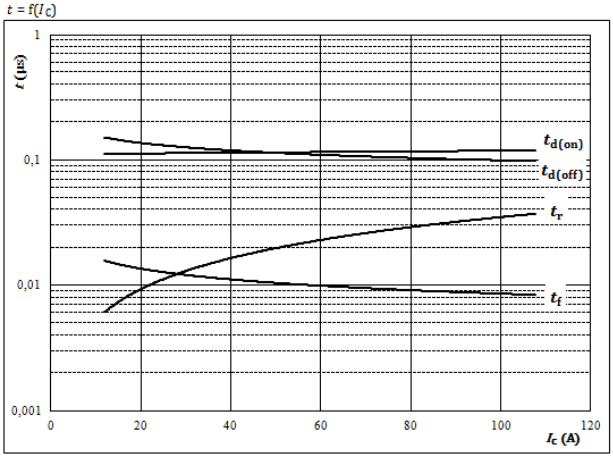
V_{CE} =	350	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
I_C =	60	A		150 °C

Buck Switching Characteristics

Figure 5. IGBT

Typical switching times as a function of collector current

$t = f(I_C)$



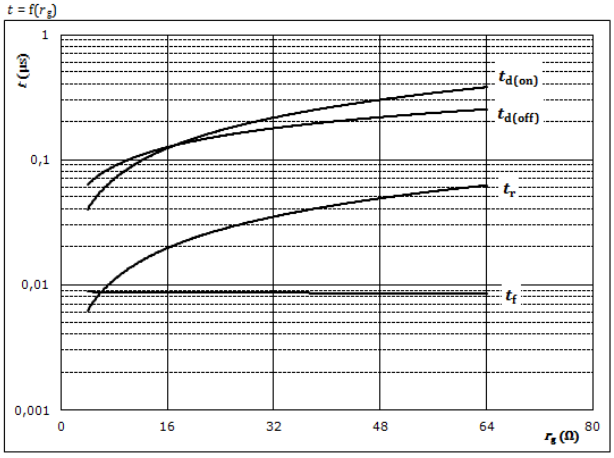
With an inductive load at

T_j =	150	°C
V_{CE} =	350	V
V_{GE} =	±15	V
R_{gon} =	16	Ω
R_{goff} =	16	Ω

Figure 6. IGBT

Typical switching times as a function of gate resistor

$t = f(r_g)$



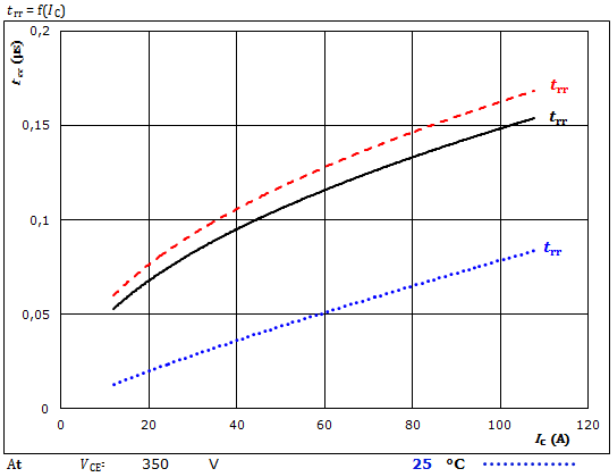
With an inductive load at

T_j =	150	°C
V_{CE} =	350	V
V_{GE} =	±15	V
I_C =	60	A

Figure 7. FWD

Typical reverse recovery time as a function of collector current

$t_{rr} = f(I_C)$

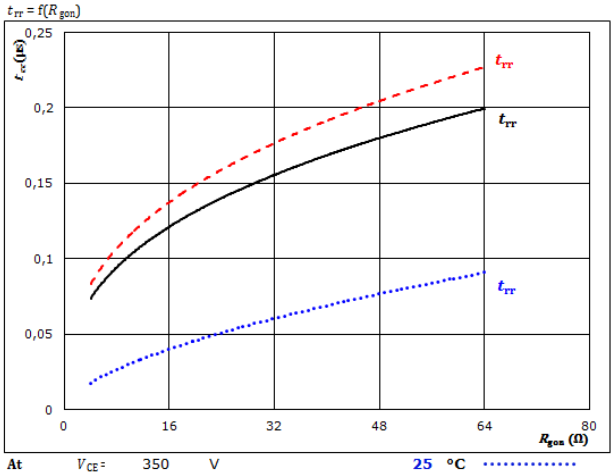


At	V_{CE} =	350	V	T_j:	25 °C
	V_{GE} =	±15	V		125 °C
	R_{gon} =	16	Ω		150 °C

Figure 8. FWD

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

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



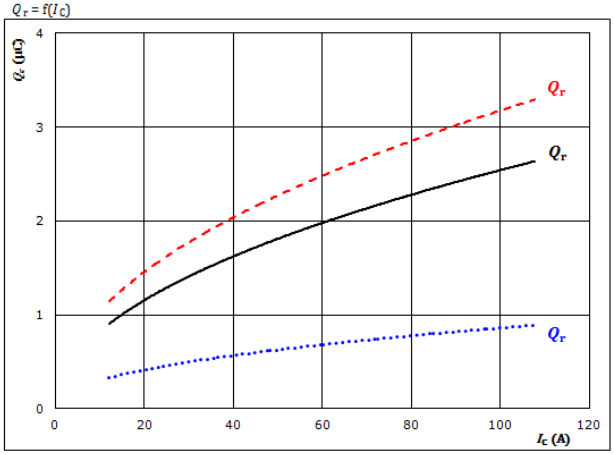
At	V_{CE} =	350	V	T_j:	25 °C
	V_{GE} =	±15	V		125 °C
	I_C =	60	A		150 °C

Buck Switching Characteristics

Figure 9. FWD

Typical recovered charge as a function of collector current

$Q_r = f(I_C)$

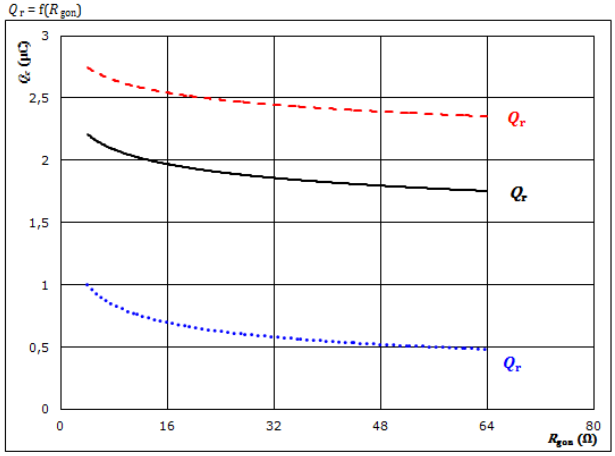


At					
V_{CE} =	350	V		25 °C	
V_{GE} =	±15	V	T_j:	125 °C	
R_{gon} =	16	Ω		150 °C	

Figure 10. FWD

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

$Q_r = f(R_{gon})$

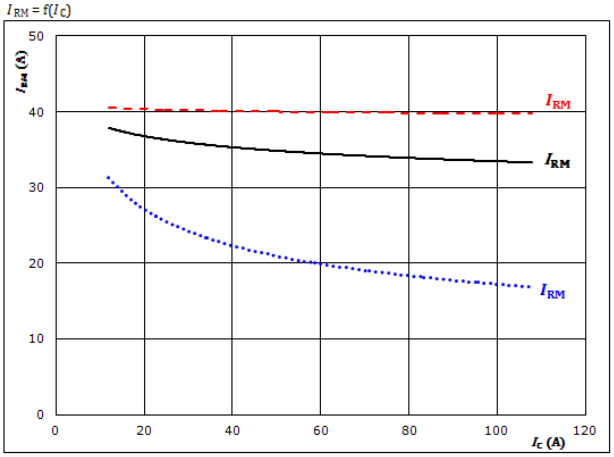


At					
V_{CE} =	350	V		25 °C	
V_{GE} =	±15	V	T_j:	125 °C	
I_C =	60	A		150 °C	

Figure 11. FWD

Typical peak reverse recovery current current as a function of collector current

$I_{RM} = f(I_C)$

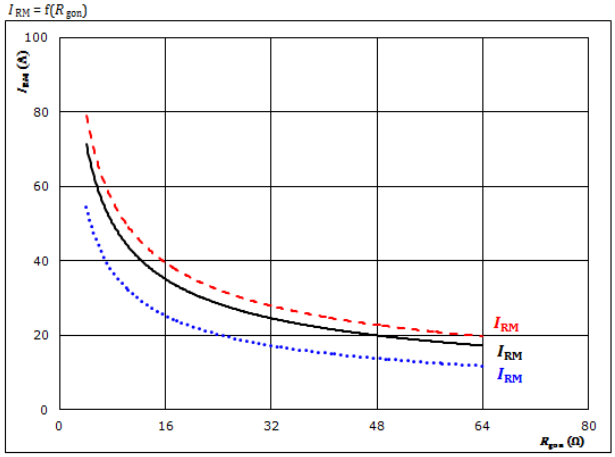


At					
V_{CE}	350	V		25 °C	
V_{GE} =	±15	V	T_j:	125 °C	
R_{gon} =	16	Ω		150 °C	

Figure 12. FWD

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

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



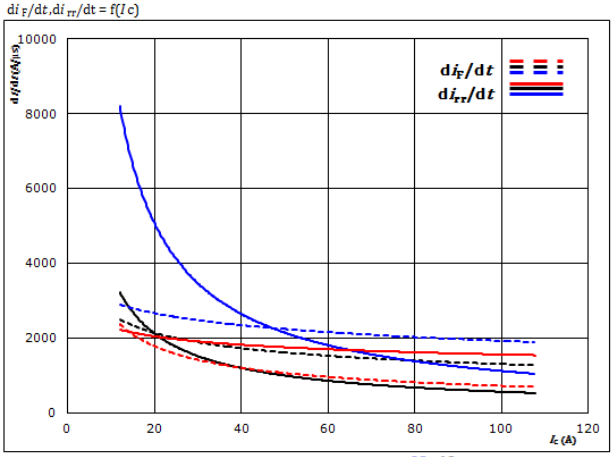
At					
V_{CE} =	350	V		25 °C	
V_{GE} =	±15	V	T_j:	125 °C	
I_C =	60	A		150 °C	

Buck Switching Characteristics

Figure 13. FWD

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

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

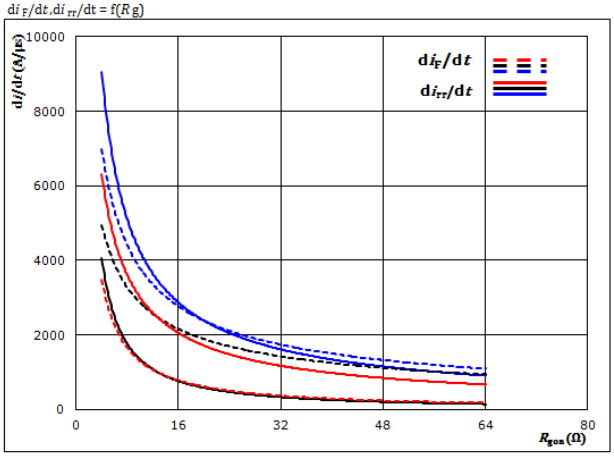


At					
V_{CE}	350	V		25 °C	
V_{GE} =	±15	V	T_j:	125 °C	
R_{gon} =	16	Ω		150 °C	

Figure 14. FWD

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

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

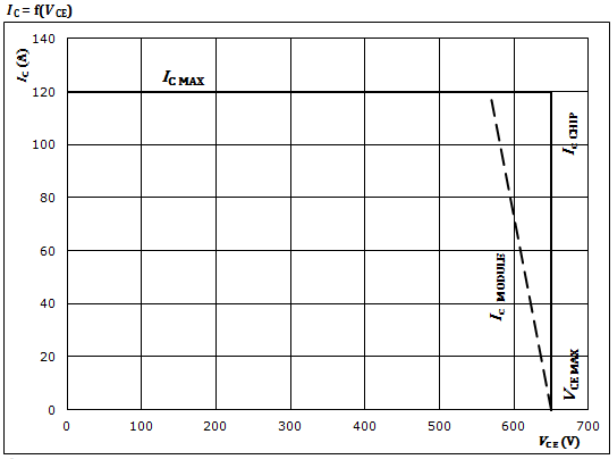


At			
V_{CE} =	350	V	
V_{GE} =	±15	V	
I_C =	60	A	

Figure 15. IGBT

Reverse bias safe operating area

$I_C = f(V_{CE})$



At

T_j =	175	°C
R_{gon} =	16	Ω
R_{goff} =	16	Ω

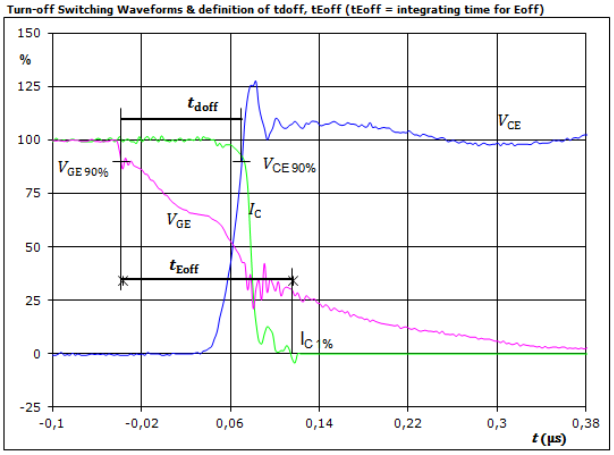
Buck Switching Definitions

General conditions

T_j	=	125 °C
R_{gon}	=	16 Ω
R_{goff}	=	16 Ω

Figure 1. IGBT

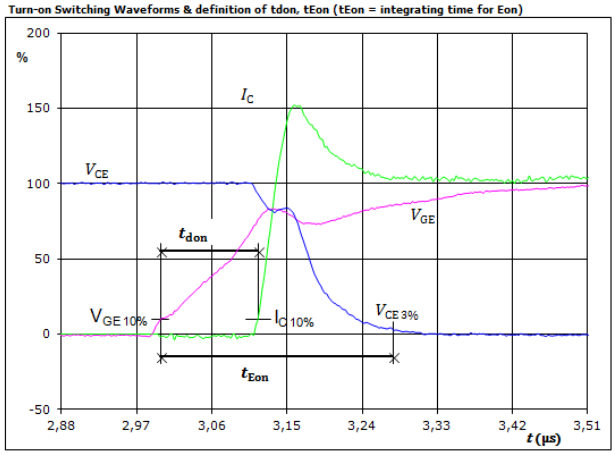
Turn-off Switching Waveforms & definition of tdoff, tEoff (tEoff = integrating time for Eoff)



$V_{GE}(0\%)$ =	-15	V
$V_{GE}(100\%)$ =	15	V
$V_C(100\%)$ =	350	V
$I_C(100\%)$ =	60	A
t_{doff} =	0,108	µs
t_{Eoff} =	0,153	µs

Figure 2. IGBT

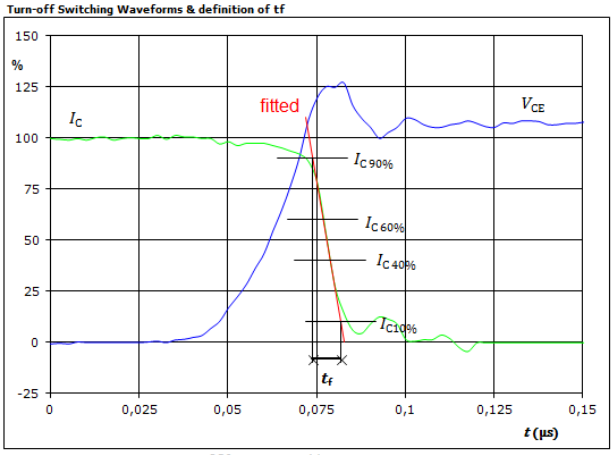
Turn-on Switching Waveforms & definition of tdon, tEon (tEon = integrating time for Eon)



$V_{GE}(0\%)$ =	-15	V
$V_{GE}(100\%)$ =	15	V
$V_C(100\%)$ =	350	V
$I_C(100\%)$ =	60	A
t_{don} =	0,117	µs
t_{Eon} =	0,279	µs

Figure 3. IGBT

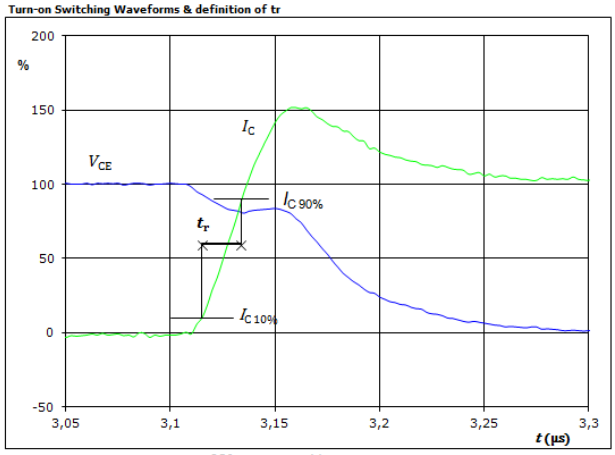
Turn-off Switching Waveforms & definition of tf



$V_C(100\%)$ =	350	V
$I_C(100\%)$ =	60	A
t_f =	0,008	µs

Figure 4. IGBT

Turn-on Switching Waveforms & definition of tr

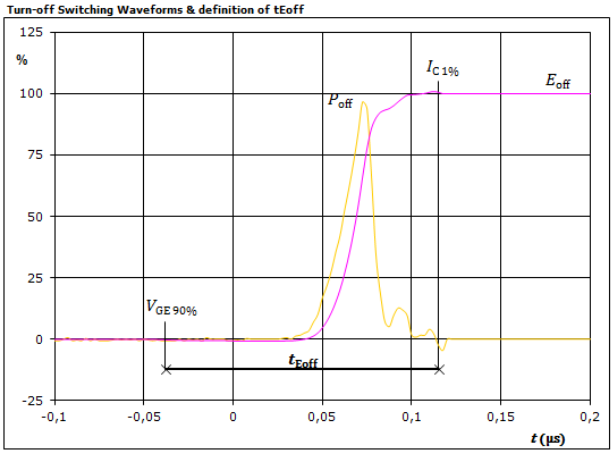


$V_C(100\%)$ =	350	V
$I_C(100\%)$ =	60	A
t_r =	0,019	µs

Buck Switching Definitions

Figure 5. IGBT

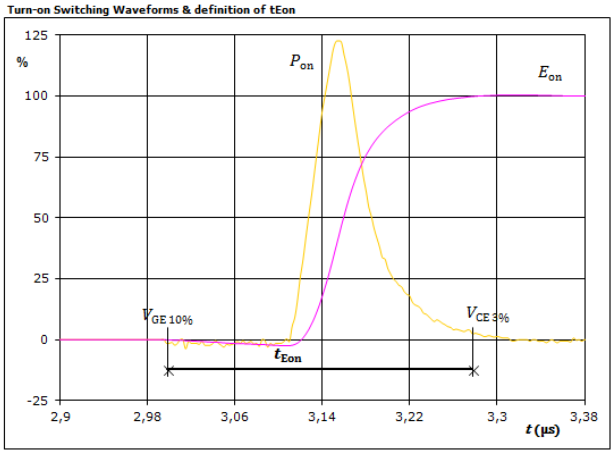
Turn-off Switching Waveforms & definition of tEoff



P_{off} (100%) =	20,97	kW
E_{off} (100%) =	0,42	mJ
t_{Eoff} =	0,15	µs

Figure 6. IGBT

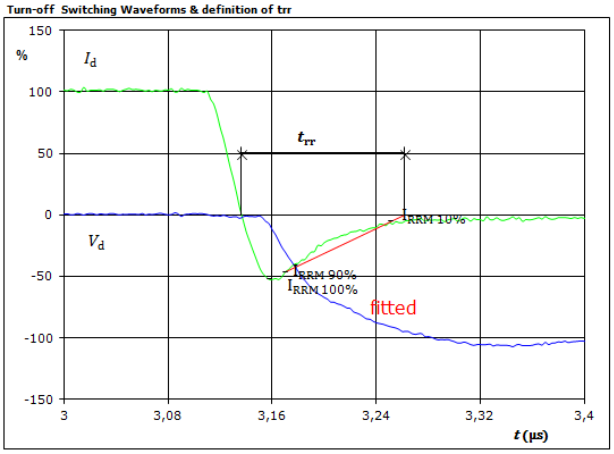
Turn-on Switching Waveforms & definition of tEon



P_{on} (100%) =	20,97	kW
E_{on} (100%) =	1,49	mJ
t_{Eon} =	0,28	µs

Figure 7. FWD

Turn-off Switching Waveforms & definition of trr

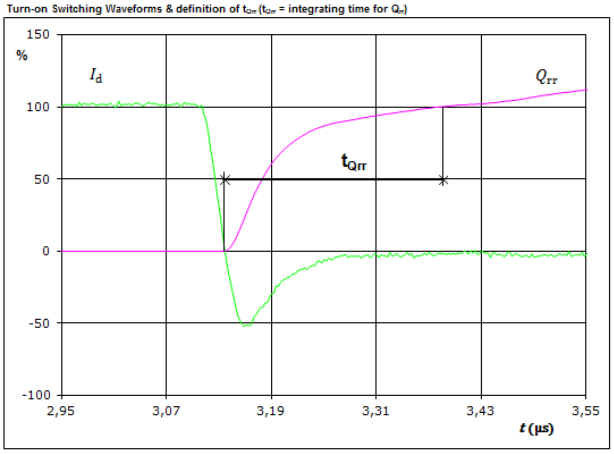


V_d (100%) =	350	V
I_d (100%) =	60	A
I_{RRM} (100%) =	-32	A
t_{rr} =	0,124	µs

Buck Switching Definitions

Figure 8. FWD

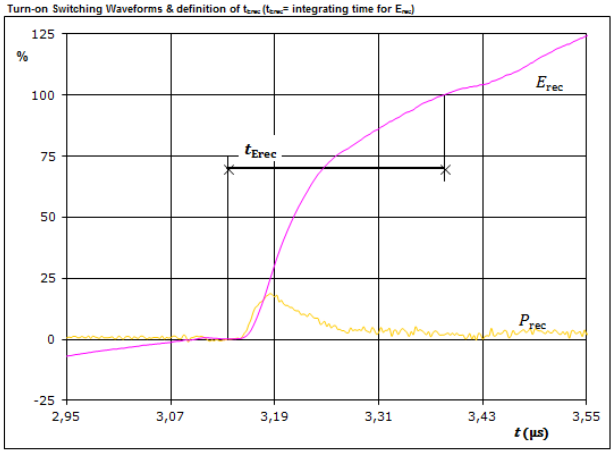
Turn-on Switching Waveforms & definition of t_{Qrr} (t_{Qrr} = integrating time for Q_{rr})



I_d (100%) =	60	A
Q_{rr} (100%) =	2,07	µC
t_{Qrr} =	0,25	µs

Figure 9. FWD

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



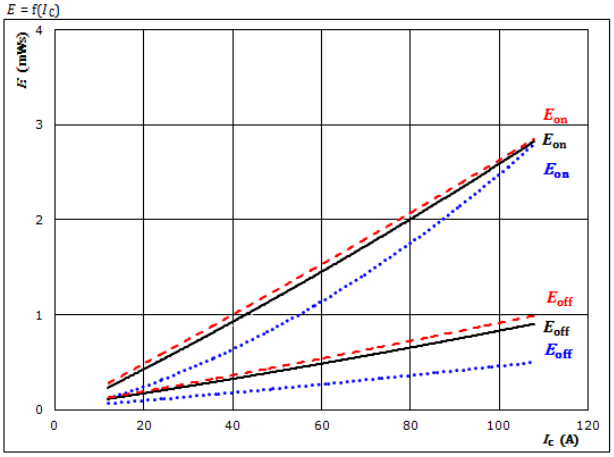
P_{rec} (100%) =	20,97	kW
E_{rec} (100%) =	0,34	mJ
t_{Erec} =	0,25	µs

Out. Boost Switching Characteristics

Figure 1. IGBT

Typical switching energy losses as a function of collector current

$E = f(I_C)$



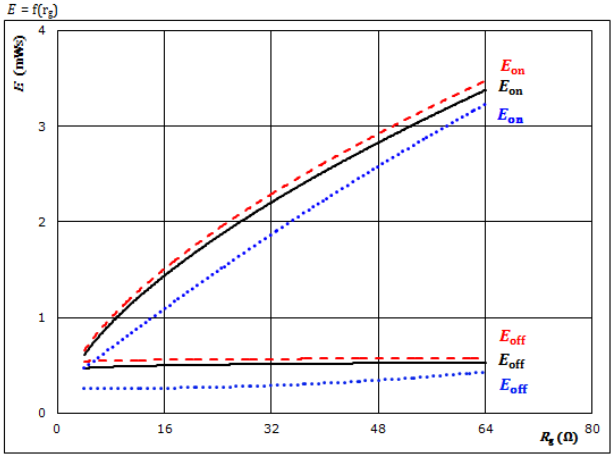
With an inductive load at

V_{CE} =	350	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
R_{gon} =	16	Ω		150 °C
R_{goff} =	16	Ω		

Figure 2. IGBT

Typical switching energy losses as a function of gate resistor

$E = f(r_g)$



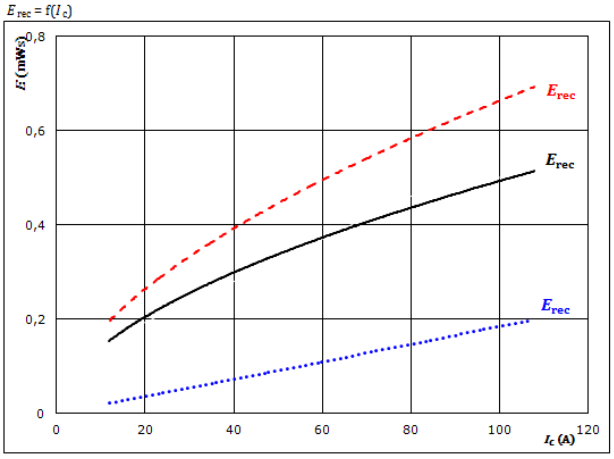
With an inductive load at

V_{CE} =	350	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
I_C =	60	A		150 °C

Figure 3. FWD

Typical reverse recovered energy loss as a function of collector current

$E_{rec} = f(I_c)$



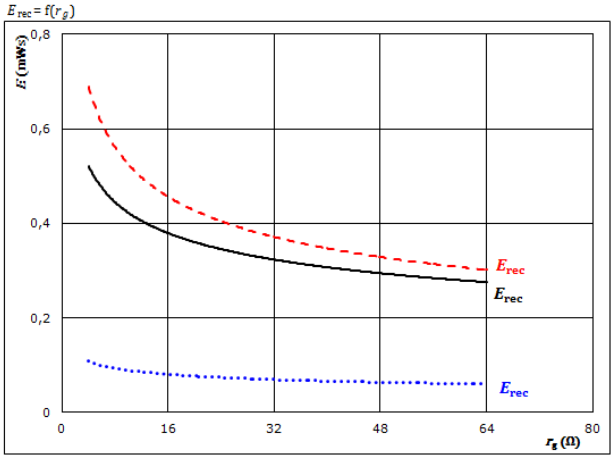
With an inductive load at

V_{CE} =	350	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
R_{gon} =	16	Ω		150 °C

Figure 4. FWD

Typical reverse recovered energy loss as a function of gate resistor

$E_{rec} = f(r_g)$



With an inductive load at

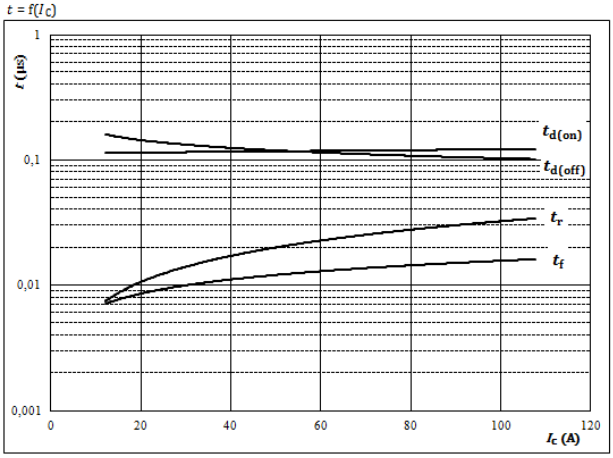
V_{CE} =	350	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
I_C =	60	A		150 °C

Out. Boost Switching Characteristics

Figure 5. IGBT

Typical switching times as a function of collector current

$t = f(I_C)$



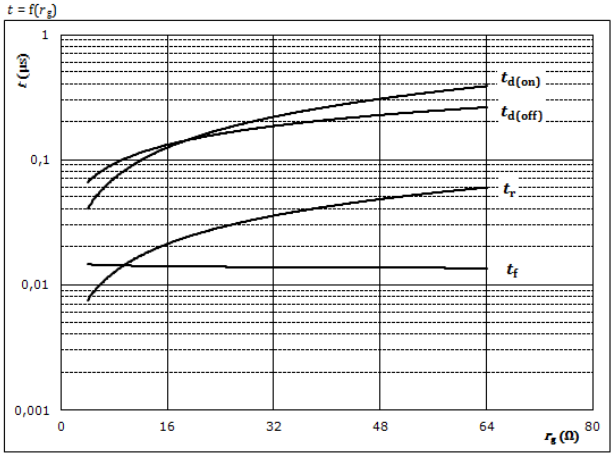
With an inductive load at

T_j =	150	°C
V_{CE} =	350	V
V_{GE} =	±15	V
R_{gon} =	16	Ω
R_{goff} =	16	Ω

Figure 6. IGBT

Typical switching times as a function of gate resistor

$t = f(r_g)$



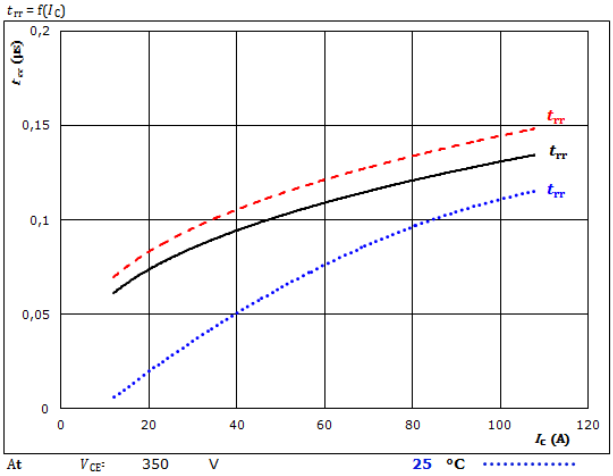
With an inductive load at

T_j =	150	°C
V_{CE} =	350	V
V_{GE} =	±15	V
I_C =	60	A

Figure 7. FWD

Typical reverse recovery time as a function of collector current

$t_{rr} = f(I_C)$

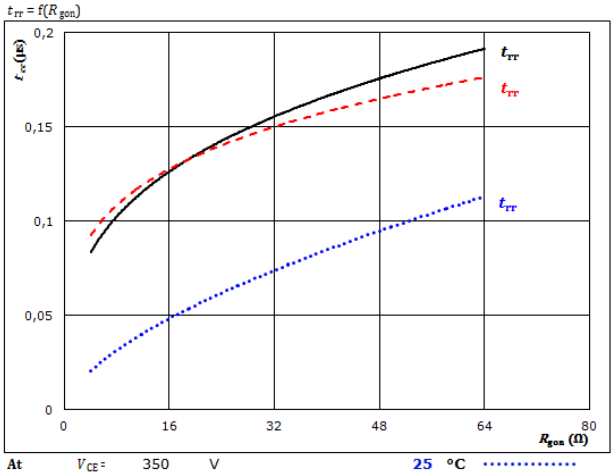


At	V_{CE} =	350 V	T_j:	25 °C	·····
	V_{GE} =	±15 V		125 °C	———
	R_{gon} =	16 Ω		150 °C	– – – –

Figure 8. FWD

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

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



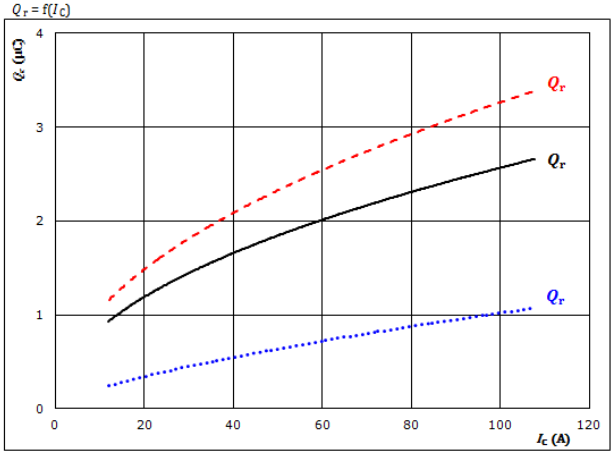
At	V_{CE} =	350 V	T_j:	25 °C	·····
	V_{GE} =	±15 V		125 °C	———
	I_C =	60 A		150 °C	– – – –

Out. Boost Switching Characteristics

Figure 9. FWD

Typical recovered charge as a function of collector current

$Q_r = f(I_C)$

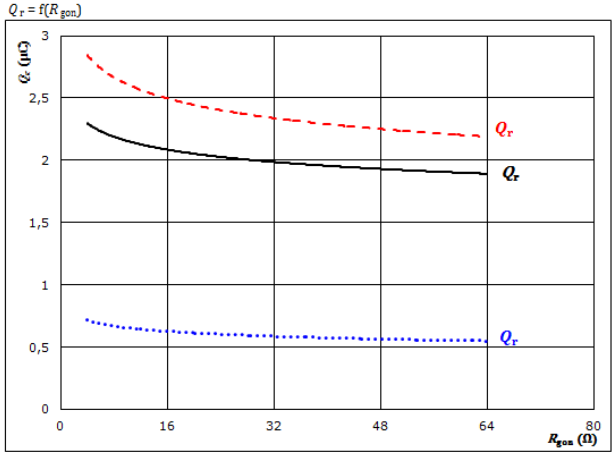


At					
V_{CE} =	350	V		25 °C	
V_{GE} =	±15	V	T_j:	125 °C	
R_{gon} =	16	Ω		150 °C	

Figure 10. FWD

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

$Q_r = f(R_{gon})$

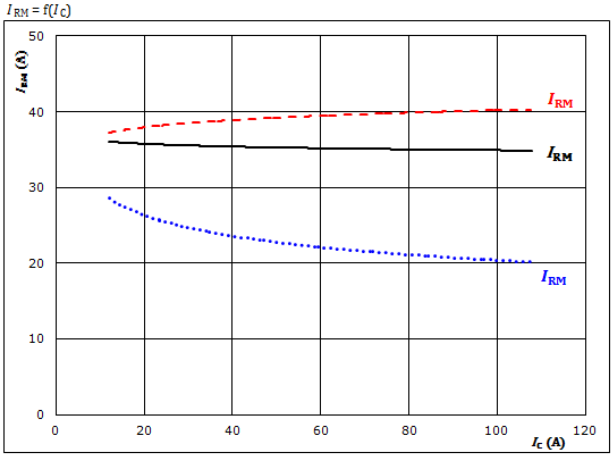


At					
V_{CE}=	350	V		25 °C	
V_{GE} =	±15	V	T_j:	125 °C	
I_C=	60	A		150 °C	

Figure 11. FWD

Typical peak reverse recovery current current as a function of collector current

$I_{RM} = f(I_C)$

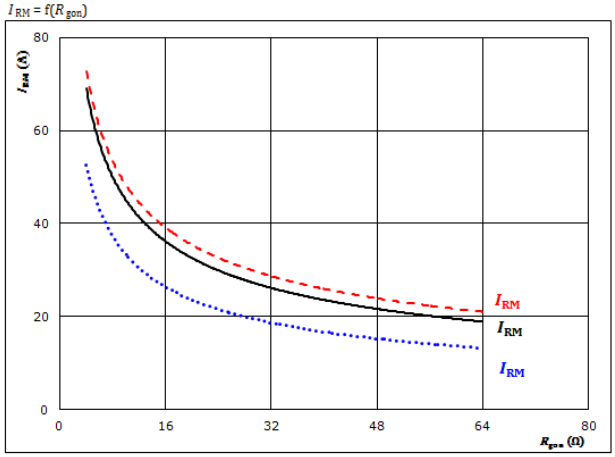


At					
V_{CE}	350	V		25 °C	
V_{GE} =	±15	V	T_j:	125 °C	
R_{gon} =	16	Ω		150 °C	

Figure 12. FWD

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

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



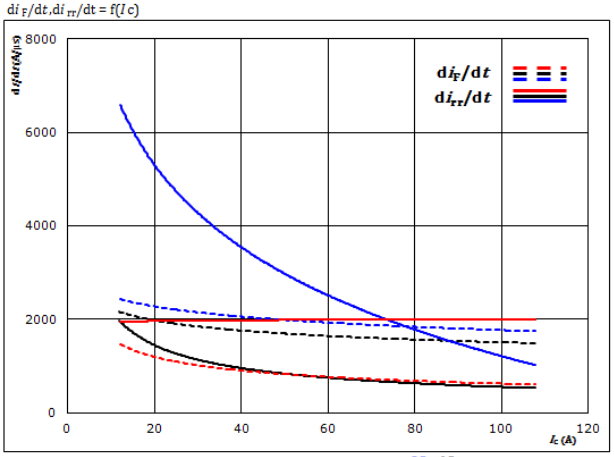
At					
V_{CE} =	350	V		25 °C	
V_{GE} =	±15	V	T_j:	125 °C	
I_C =	60	A		150 °C	

Out. Boost Switching Characteristics

Figure 13. FWD

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

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

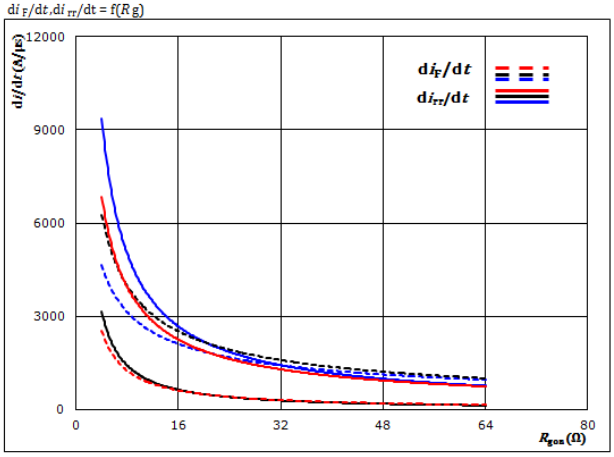


At	V_{CE}	350	V	25 °C	·····
	V_{GE} =	±15	V	T_j: 125 °C	———
	R_{gon} =	16	Ω	150 °C	– – –

Figure 14. FWD

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

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

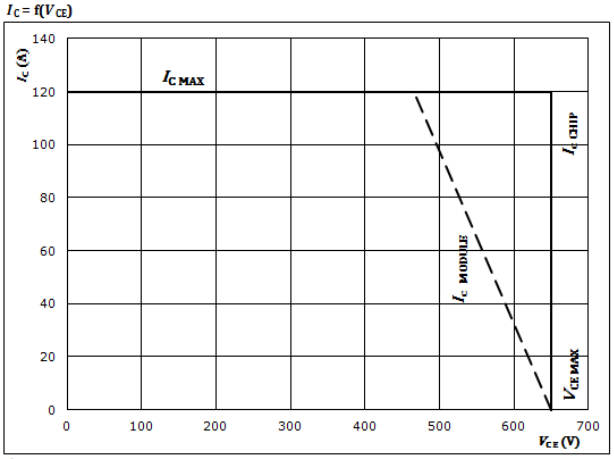


At	V_{CE} =	350	V
	V_{GE} =	±15	V
	I_C =	60	A

Figure 15. IGBT

Reverse bias safe operating area

$I_C = f(V_{CE})$



At

T_j =	175	°C
R_{gon} =	16	Ω
R_{goff} =	16	Ω

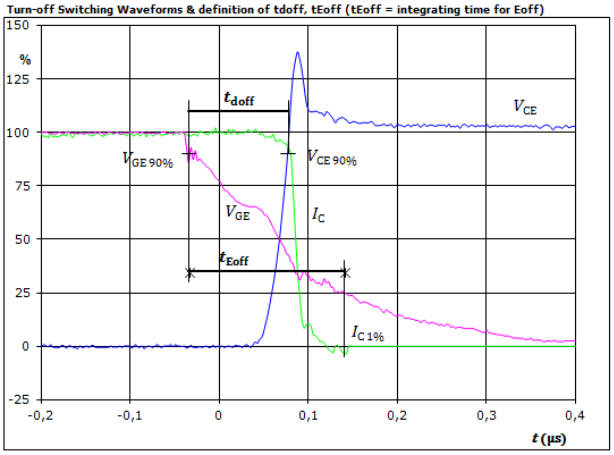
Out. Boost Switching Definitions

General conditions

T_j	=	125 °C
R_{gon}	=	16 Ω
R_{goff}	=	16 Ω

Figure 1. IGBT

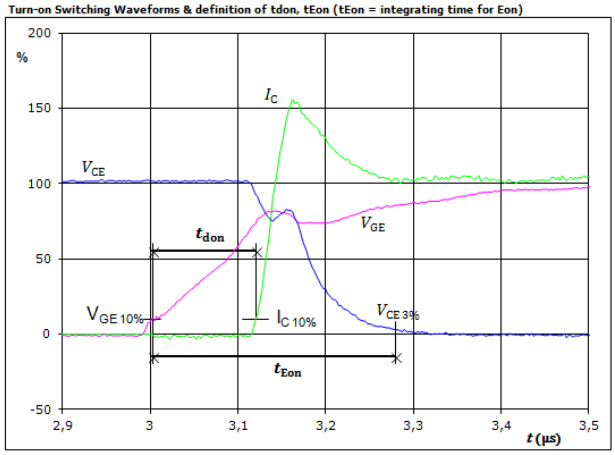
Turn-off Switching Waveforms & definition of tdoff, tEoff (tEoff = integrating time for Eoff)



V_{GE} (0%) =	-15	V
V_{GE} (100%) =	15	V
V_C (100%) =	350	V
I_C (100%) =	60	A
t_{doff} =	0,112	µs
t_{Eoff} =	0,175	µs

Figure 2. IGBT

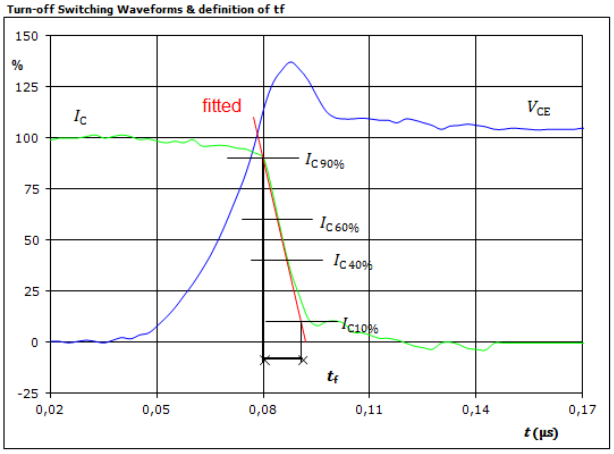
Turn-on Switching Waveforms & definition of tdon, tEon (tEon = integrating time for Eon)



V_{GE} (0%) =	-15	V
V_{GE} (100%) =	15	V
V_C (100%) =	350	V
I_C (100%) =	60	A
t_{don} =	0,118	µs
t_{Eon} =	0,277	µs

Figure 3. IGBT

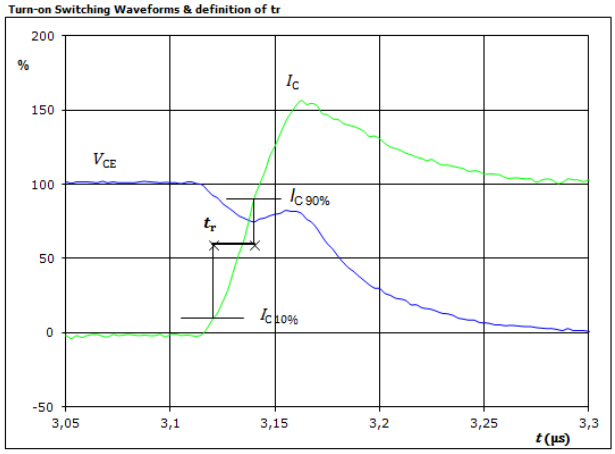
Turn-off Switching Waveforms & definition of tf



V_C (100%) =	350	V
I_C (100%) =	60	A
t_f =	0,011	µs

Figure 4. IGBT

Turn-on Switching Waveforms & definition of tr

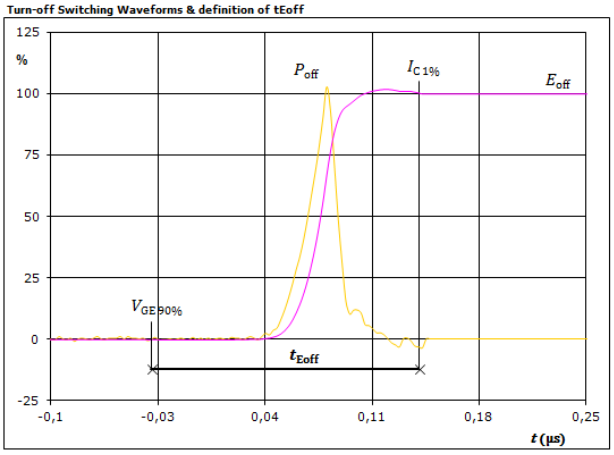


V_C (100%) =	350	V
I_C (100%) =	60	A
t_r =	0,02	µs

Out. Boost Switching Definitions

Figure 5. IGBT

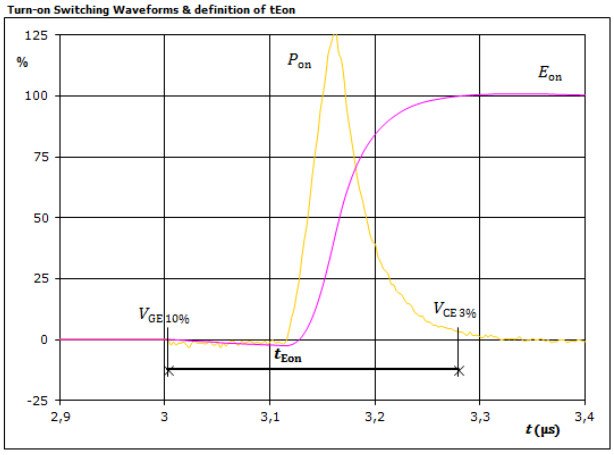
Turn-off Switching Waveforms & definition of tEoff



P_{off} (100%) =	20,98	kW
E_{off} (100%) =	0,49	mJ
t_{Eoff} =	0,175	µs

Figure 6. IGBT

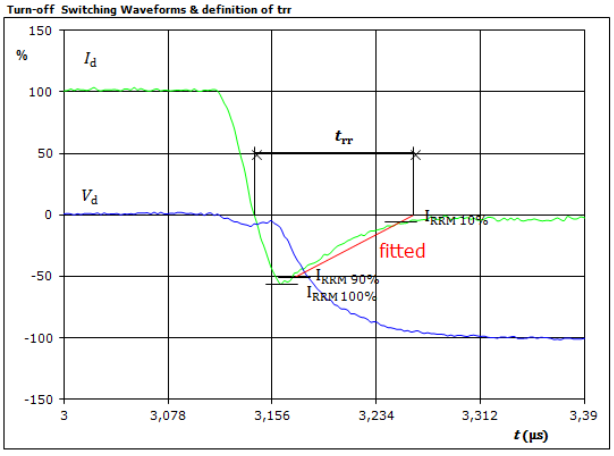
Turn-on Switching Waveforms & definition of tEon



P_{on} (100%) =	20,98	kW
E_{on} (100%) =	1,45	mJ
t_{Eon} =	0,277	µs

Figure 7. FWD

Turn-off Switching Waveforms & definition of trr

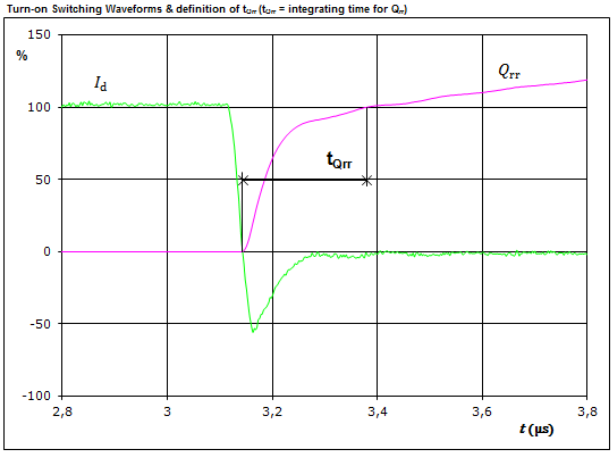


V_d (100%) =	350	V
I_d (100%) =	60	A
I_{RRM} (100%) =	-34	A
t_{rr} =	0,119	µs

Out. Boost Switching Definitions

Figure 8. FWD

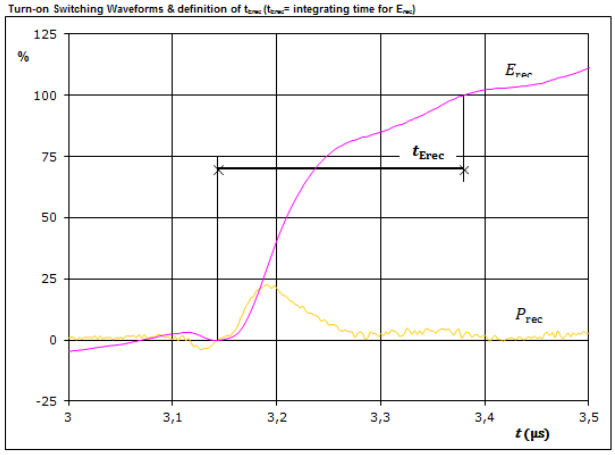
Turn-on Switching Waveforms & definition of t_{Qrr} (t_{Qrr} = integrating time for Q_{rr})



I_d (100%) =	60	A
Q_{rr} (100%) =	2,07	µC
t_{Qrr} =	0,24	µs

Figure 9. FWD

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



P_{rec} (100%) =	20,98	kW
E_{rec} (100%) =	0,37	mJ
t_{Erec} =	0,236	µs

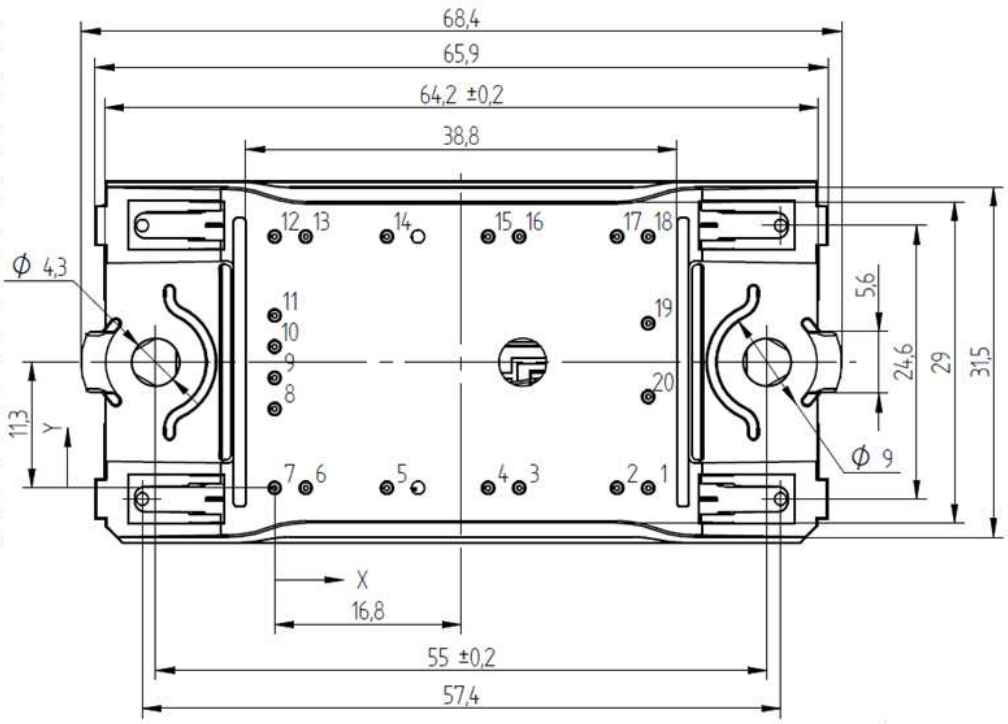
Ordering Code & Marking

Version	Ordering Code	in DataMatrix as	in packaging barcode as
without thermal paste 12 mm housing	10-FZ07NIA060SM-P926F43	P926F43	P926F43

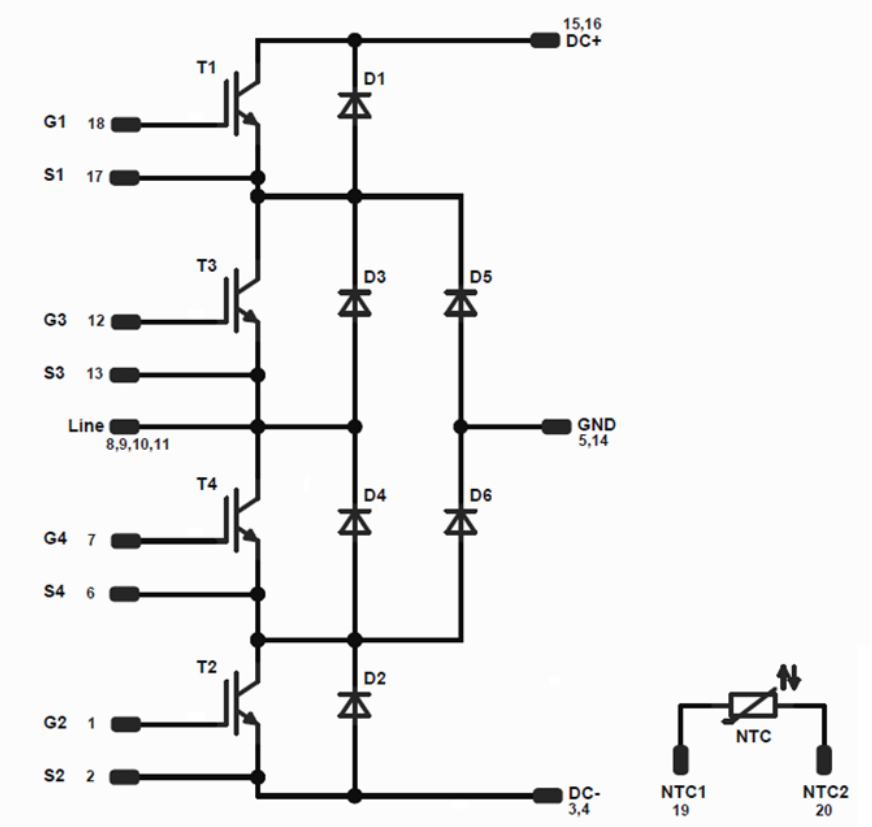
Text	Name		Date code	UL & Vinco	Lot	Serial
	NN-NNNNNNNNNNNNNN-NNNNNNNN		WWYY	UL Vinco	LLLLL	SSSS
Datamatrix	Type	Lot number	Serial	Date code		
	TTTT-TTT	LLLLL	SSSS	WWYY		

Outline

Pin table [mm]			
Pin	X	Y	Function
1	33,6	0	G2
2	30,8	0	S2
3	22	0	DC-
4	19,2	0	DC-
5	10,1	0	GND
6	2,8	0	S4
7	0	0	G4
8	0	7,1	Line
9	0	9,9	Line
10	0	12,7	Line
11	0	15,5	Line
12	0	22,6	G3
13	2,8	22,6	S3
14	10,1	22,6	GND
15	19,2	22,6	DC+
16	22	22,6	DC+
17	30,8	22,6	S1
18	33,6	22,6	G1
19	33,6	14,8	NTC1
20	33,6	8,2	NTC2



Pinout



Identification

ID	Component	Voltage	Current	Function	Comment
T1,T2	IGBT	650V	2x30A	Buck Switch	
D5,D6	FWD	650V	50A	Buck Diode	
T3,T4	IGBT	650V	2x30A	Out. Boost Switch	
D1,D2	FWD	650V	50A	Out. Boost Diode	
D3,D4	FWD	650V	75A	Out. Boost Inv. Diode	
NTC	NTC	-	-	Thermistor	

Packaging instruction					
Standard packaging quantity (SPQ)	135	>SPQ	Standard	<SPQ	Sample

Handling instruction
Handling instructions for *flow* 0 packages see vincotech.com website.

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