



flow 7PACK 0

1200 V / 15 A

Features

- Compact Flow 0 housing
- Trench Fieldstop IGBT4 Technology
- Compact and Low Inductance Design
- Built-in NTC

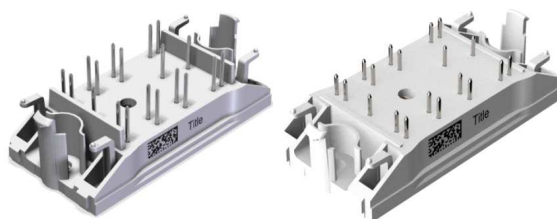
Target applications

- Motor Drives
- Power Generation

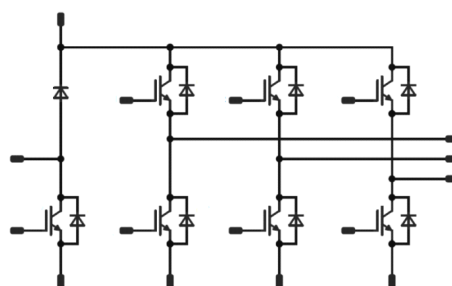
Types

- 10-F0127PA015SC-L158E09
- 10-FZ127PA015SC-L158E08

flow 0 housing



Schematic



Maximum Ratings

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

Parameter	Symbol	Condition	Value	Unit
Inverter Switch\ Brake Switch				
Collector-emitter voltage	V_{CES}		1200	V
Collector current	I_{C}	$T_j=T_{j\text{max}}$ $T_s=80^{\circ}\text{C}$	22	A
Repetitive peak collector current	I_{CRM}	t_p limited by $T_{j\text{max}}$	45	A
Total power dissipation	P_{tot}	$T_j=T_{j\text{max}}$ $T_s=80^{\circ}\text{C}$	71	W
Gate-emitter voltage	V_{GES}		± 20	V
Maximum Junction Temperature	$T_{j\text{max}}$		175	$^{\circ}\text{C}$



Parameter	Symbol	Conditions	Value	Unit
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Inverter Diode

Peak Repetitive Reverse Voltage	V_{RRM}		1200	V
Continuous (direct) forward current	I_F	$T_j = T_{jmax}$ $T_h = 80^\circ\text{C}$	24	A
Repetitive peak forward current	I_{FRM}		30	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_h = 80^\circ\text{C}$	52	W
Maximum Junction Temperature	T_{jmax}		175	$^\circ\text{C}$

Parameter	Symbol	Conditions	Value	Unit
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Brake Diode

Peak Repetitive Reverse Voltage	V_{RRM}		1200	V
Continuous (direct) forward current	I_F	$T_j = T_{jmax}$ $T_h = 80^\circ\text{C}$	20	A
Repetitive peak forward current	I_{FRM}		20	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_h = 80^\circ\text{C}$	46	W
Maximum Junction Temperature	T_{jmax}		175	$^\circ\text{C}$

Parameter	Symbol	Conditions	Value	Unit
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Brake Inverse Diode

Peak Repetitive Reverse Voltage	V_{RRM}		1200	V
Continuous (direct) forward current	I_F	$T_j = T_{jmax}$ $T_h = 80^\circ\text{C}$	6	A
Repetitive peak forward current	I_{FRM}		6	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_h = 80^\circ\text{C}$	25	W
Maximum Junction Temperature	T_{jmax}		150	$^\circ\text{C}$

Parameter	Symbol	Conditions	Value	Unit
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Module Properties

Thermal Properties

Storage temperature	T_{stg}		-40...+125	$^\circ\text{C}$
Operation Junction Temperature	T_{jop}		-40...+($T_{jmax} - 25$)	$^\circ\text{C}$

Isolation Properties

Isolation voltage	V_{isol}	DC voltage	$t_p = 2\text{s}$	4000	V
Creepage distance				min 12,7	mm
Clearance				min 12,7	mm
Comparative Tracking Index	CTI			>200	



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Characteristic Values

Inverter 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	$V_{GE(th)}$	$V_{CE}=V_{CE}$			0,0005	25 125	5,3	5,8	6,3	V
Collector-emitter saturation voltage	V_{CEsat}		15		15	25 125 150	1,58	1,89 -	2,07	V
Collector-emitter cut-off current	I_{CES}		0	1200		25 125			2	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		890		pF
Reverse transfer capacitance	C_{res}							30		

Thermal

Thermal resistance junction to sink	$R_{th(j-s)}$	Phase-Change Material $\lambda=3,4W/mK$						1,35		K/W
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IGBT Switching

Turn-on delay time	$t_{d(on)}$	$R_{goff} = 32 \Omega$ $R_{gon} = 32 \Omega$	± 15	600	15	25 150		85 93		ns
Rise time	t_r					25 150		30 32		
Turn-off delay time	$t_{d(off)}$					25 150		214 285		
Fall time	t_f					25 150		83 142		
Turn-on energy (per pulse)	E_{on}	$Q_{rFWD} = 1,5 \mu C$ $Q_{rFWD} = 3 \mu C$	± 15	600	15	25 150		1,165 1,780		mWs
Turn-off energy (per pulse)	E_{off}					25 150		0,892 1,526		



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Inverter Diode

Parameter	Symbol	Conditions					Value			Unit
				V_r [V]	I_F [A]	T_j [°C]	Min	Typ	Max	

Static

Forward voltage	V_F				15	25 125 150		1,80 - 1,77	2,05	V
Reverse leakage current	I_r			1200		25 150			3,5 -	μA

Thermal

Thermal resistance junction to sink	$R_{th(j-s)}$	Phase-Change Material $\lambda=3,4\text{W/mK}$						1,83		K/W
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FWD Switching

Peak recovery current	I_{RRM}	$di/dt = 489\text{ A}/\mu\text{s}$ $di/dt = 455\text{ A}/\mu\text{s}$	± 15	600	15	25 150		10 13		A
Reverse recovery time	t_{rr}					25 150		297 505		ns
Recovered charge	Q_r					25 150		1,506 3,042		μC
Reverse recovered energy	E_{rec}					25 150		0,586 1,219		mWs
Peak rate of fall of recovery current	$(di_{rr}/dt)_{max}$					25 150		50 41		A/μs



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Brake 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	$V_{GE(th)}$	$V_{GE}=V_{CE}$			0,0005	25 125	5,3	5,8	6,3	V
Collector-emitter saturation voltage	V_{CEsat}		15		15	25 125 150	1,58	1,89 -	2,07	V
Collector-emitter cut-off current	I_{CES}		0	1200		25 125			2	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		890		pF
Reverse transfer capacitance	C_{res}							30		

Thermal

Thermal resistance junction to sink	$R_{th(j-s)}$	Phase-Change Material $\lambda=3,4\text{W/mK}$						1,35		K/W
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IGBT Switching

Turn-on delay time	$t_{d(on)}$	$R_{goff} = 32\ \Omega$ $R_{gon} = 32\ \Omega$	± 15	600	15	25 125 150		87 87 88		ns
Rise time	t_r					25 125 150		24 28 29		
Turn-off delay time	$t_{d(off)}$					25 125 150		194 256 258		
Fall time	t_f					25 125 150		77 102 111		
Turn-on energy (per pulse)	E_{on}	$Q_{rFWD} = 1,4\ \mu\text{C}$ $Q_{rFWD} = 2,3\ \mu\text{C}$ $Q_{rFWD} = 2,5\ \mu\text{C}$	± 15	600	15	25 125 150		0,950 1,288 1,381		mWs
Turn-off energy (per pulse)	E_{off}					25 125 150		0,824 1,174 1,273		



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Brake Diode

Parameter	Symbol	Conditions					Value			Unit
				V_r [V]	I_F [A]	T_j [°C]	Min	Typ	Max	
Static										
Forward voltage	V_F				10	25 125 150		1,76 - 1,68	2,05	V
Reverse leakage current	I_r			1200		25 150			2,7 -	µA
Thermal										
Thermal resistance junction to sink	$R_{th(j-s)}$	Phase-Change Material $\lambda=3,4\text{W/mK}$						2,07		K/W
FWD Switching										
Peak recovery current	I_{RRM}	$di/dt = 611\text{ A/}\mu\text{s}$ $di/dt = 482\text{ A/}\mu\text{s}$ $di/dt = 484\text{ A/}\mu\text{s}$	± 15	600	15	25 125 150		10 12 12		A
Reverse recovery time	t_{rr}					25 125 150		324 489 538		ns
Recovered charge	Q_r					25 125 150		1,380 2,271 2,531		µC
Reverse recovered energy	E_{rec}					25 125 150		0,581 0,965 1,081		mWs
Peak rate of fall of recovery current	$(di_{rr}/dt)_{max}$					25 125 150		46 46 44		A/µs



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Brake Inverse Diode

Parameter	Symbol	Conditions					Value			Unit
				V_r [V]	I_F [A]	T_j [°C]	Min	Typ	Max	

Static

Forward voltage	V_F				3	25 125 150		1,65 - 1,51	1,6	V
Reverse leakage current	I_r			1200		25 150			250 -	μA

Thermal

Thermal resistance junction to sink	$R_{th(j-s)}$	Phase-Change Material $\lambda=3,4\text{W/mK}$						2,8		K/W
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Thermistor

Parameter	Symbol	Conditions					Value			Unit
			V_{CE} [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	



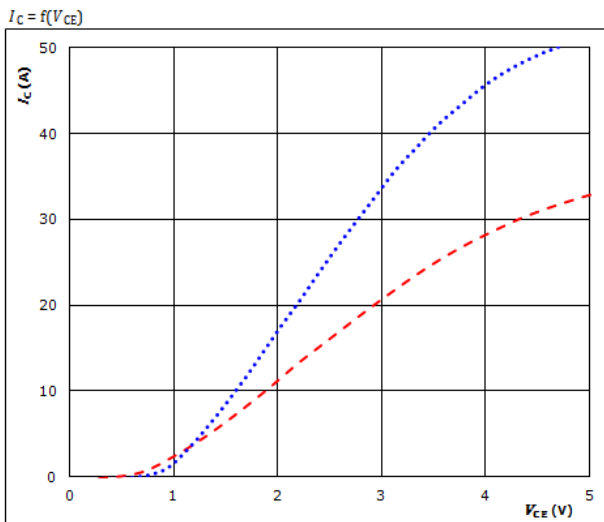
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Inverter Switch\ Brake Switch Characteristics

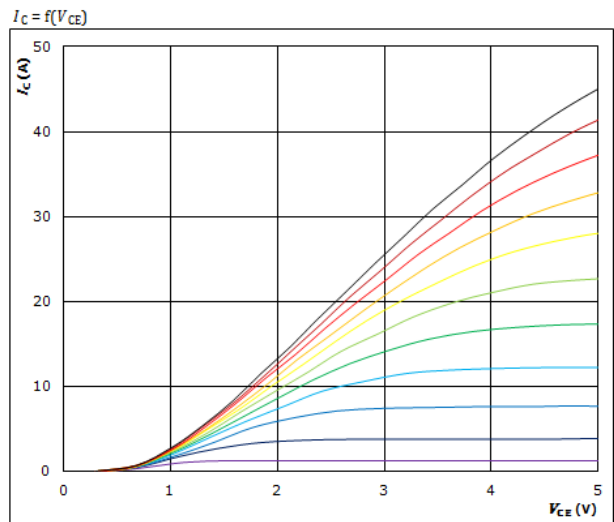
Typical output characteristics

IGBT



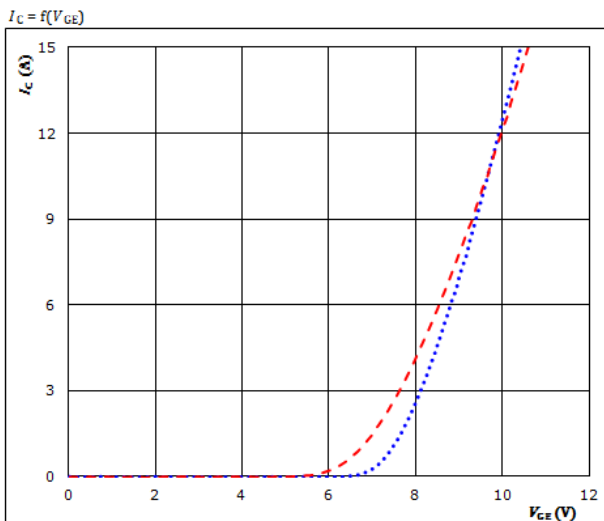
Typical output characteristics

IGBT



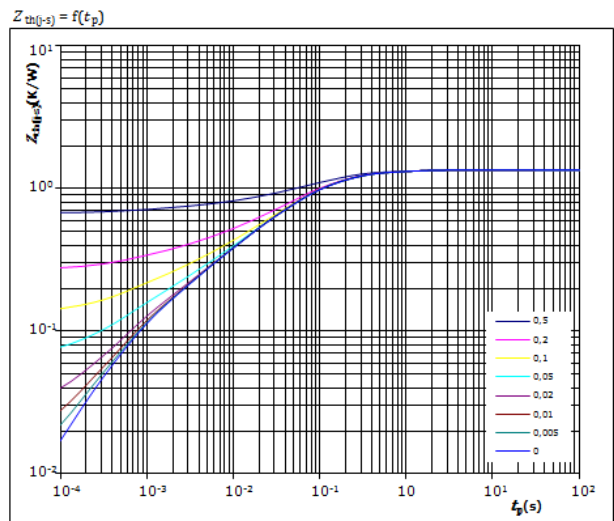
Typical transfer characteristics

IGBT



Transient Thermal Impedance as function of Pulse duration

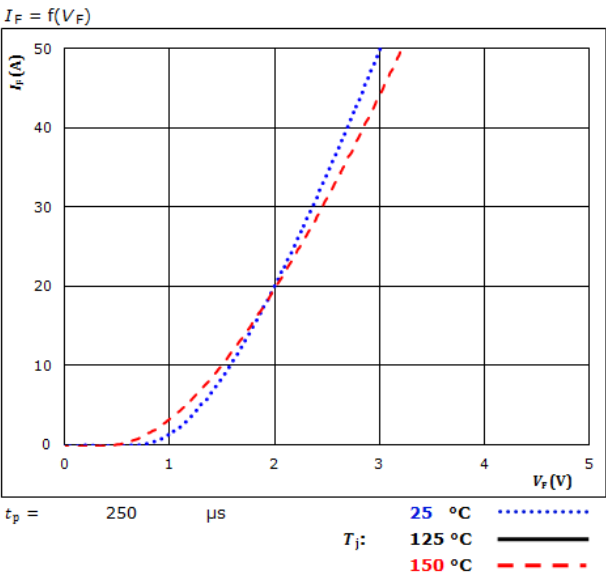
IGBT



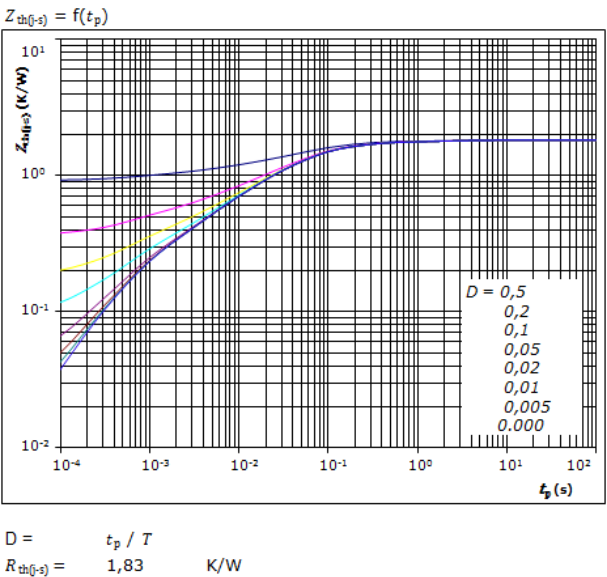


Inverter Diode Characteristics

Typical forward characteristics FWD



Transient thermal impedance as a function of pulse width FWD



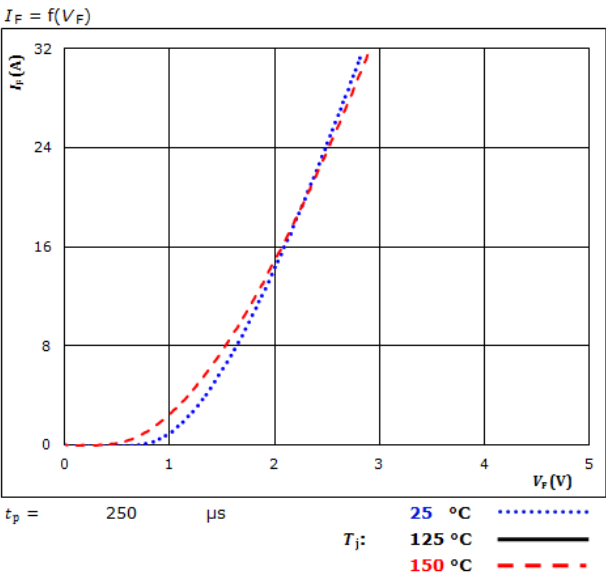
FWD thermal model values

R (K/W)	τ (s)
6,16E-02	2,79E+00
1,40E-01	3,93E-01
7,06E-01	6,76E-02
4,97E-01	1,96E-02
2,49E-01	4,04E-03
1,76E-01	5,86E-04
1,96E-01	3,48E-04

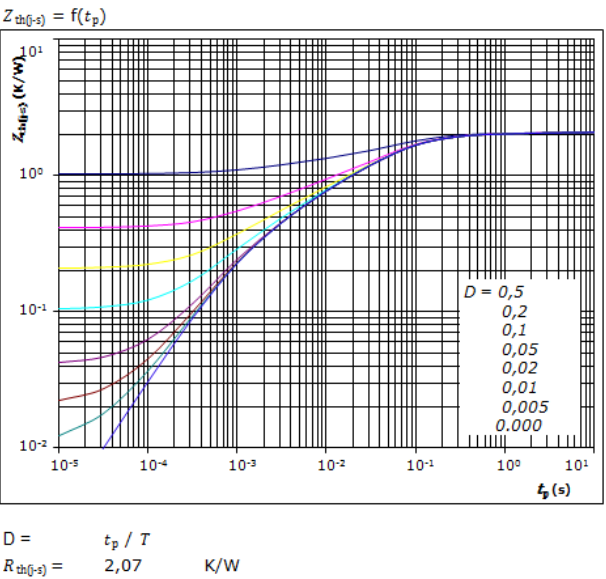


Brake Diode Characteristics

Typical forward characteristics FWD



Transient thermal impedance as a function of pulse width FWD



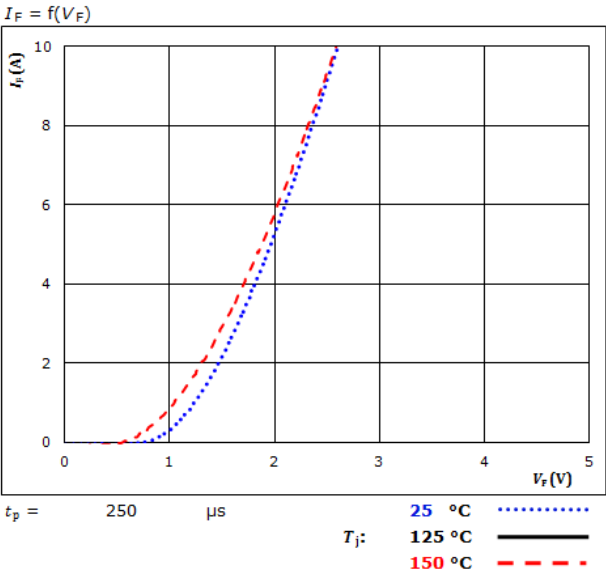
FWD thermal model values

R (K/W)	τ (s)
5,09E-02	4,26E+00
1,55E-01	5,03E-01
7,75E-01	7,89E-02
5,33E-01	2,68E-02
3,54E-01	5,03E-03
1,97E-01	9,09E-04

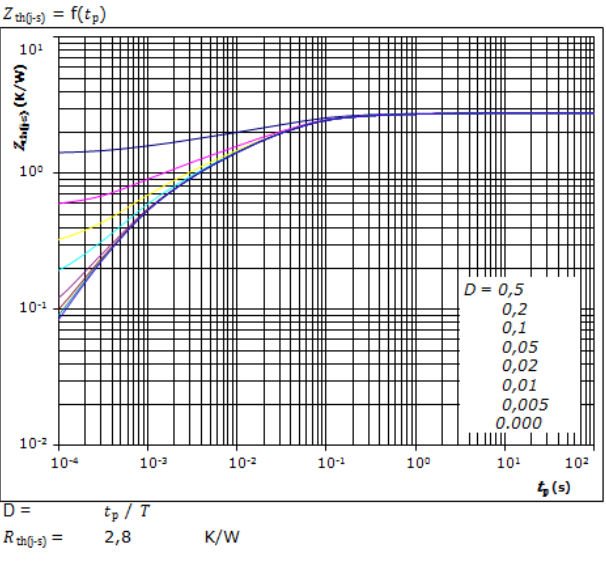


Brake Inverse Diode Characteristics

Typical forward characteristics FWD



Transient thermal impedance as a function of pulse width FWD



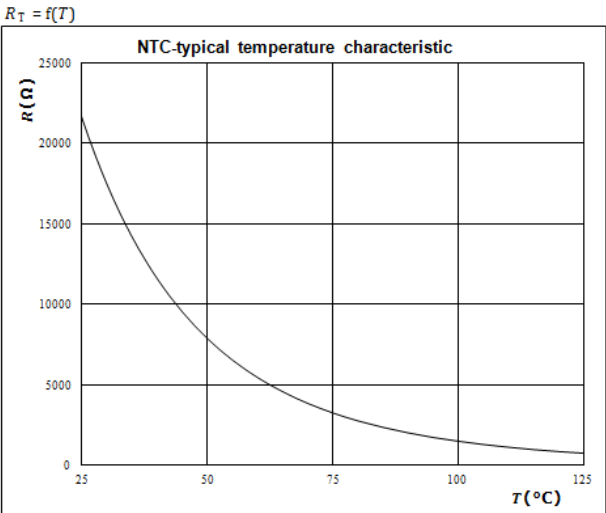
FWD thermal model values

R (K/W)	τ (s)
7,82E-02	2,45E+00
1,95E-01	2,65E-01
9,84E-01	4,77E-02
6,58E-01	1,23E-02
5,09E-01	2,70E-03
3,71E-01	5,98E-04

Thermistor Characteristics

Thermistor typical temperature characteristic

Typical NTC characteristic
 as a function of temperature





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Inverter Switching Characteristics

Figure 1. IGBT
Typical switching energy losses as a function of collector current

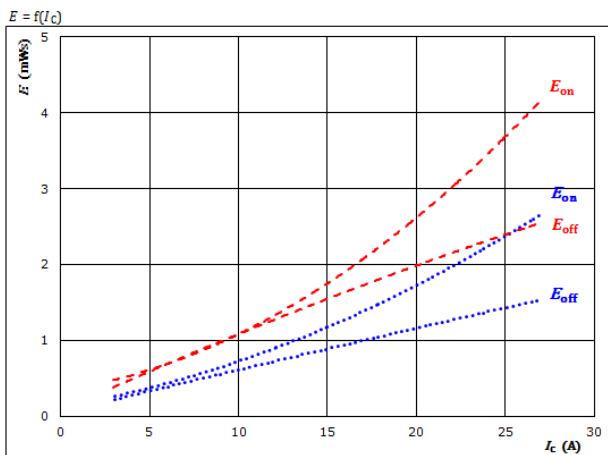


Figure 2. IGBT
Typical switching energy losses as a function of gate resistor

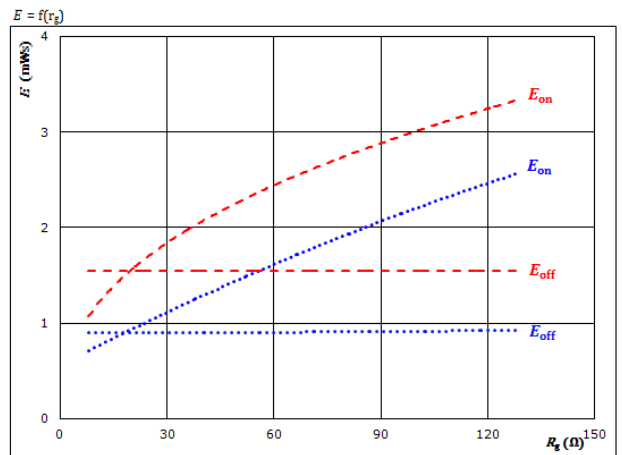


Figure 3. FWD
Typical reverse recovered energy loss as a function of collector current

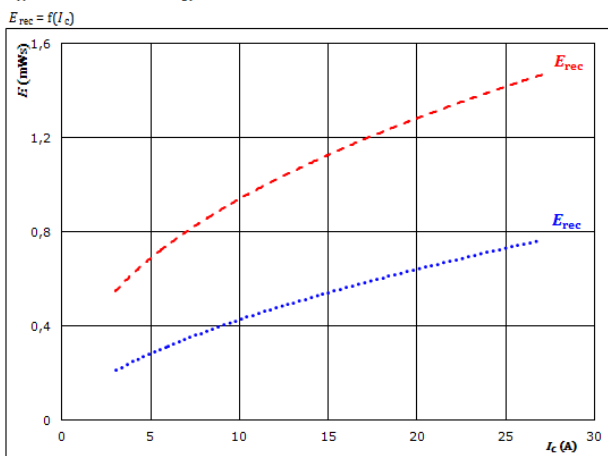
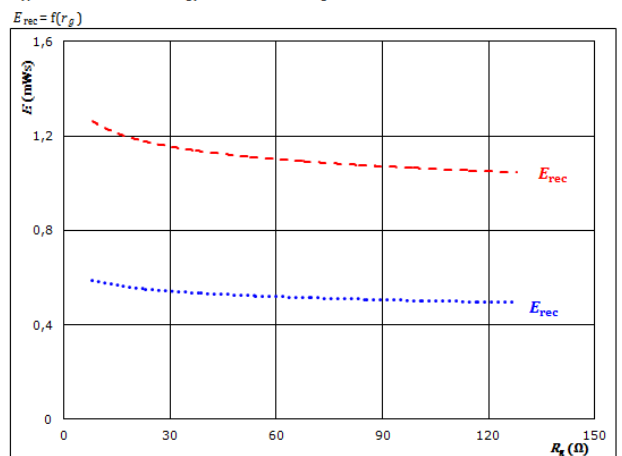


Figure 4. FWD
Typical reverse recovered energy loss as a function of gate resistor





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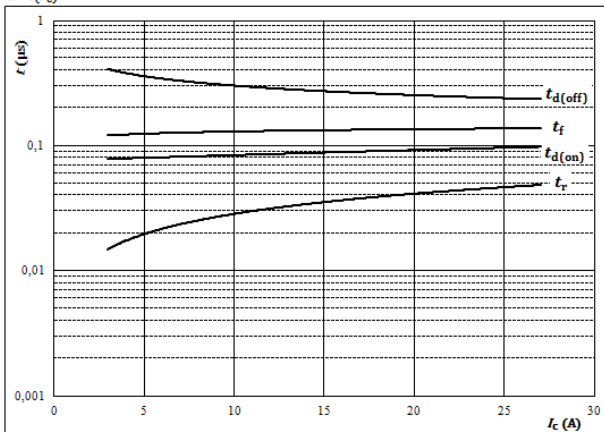
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Inverter Switching Characteristics

Figure 5. IGBT

Typical switching times as a function of collector current

$$t = f(I_C)$$



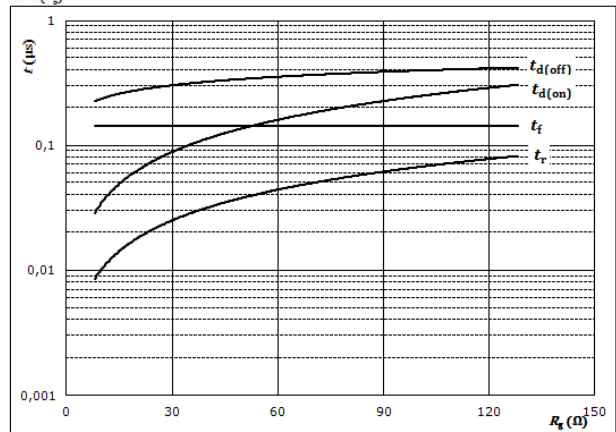
With an inductive load at

$T_J = 150$ °C
 $V_{CE} = 600$ V
 $V_{GE} = \pm 15$ V
 $R_{gon} = 32$ Ω
 $R_{goff} = 32$ Ω

Figure 6. IGBT

Typical switching times as a function of gate resistor

$$t = f(R_g)$$



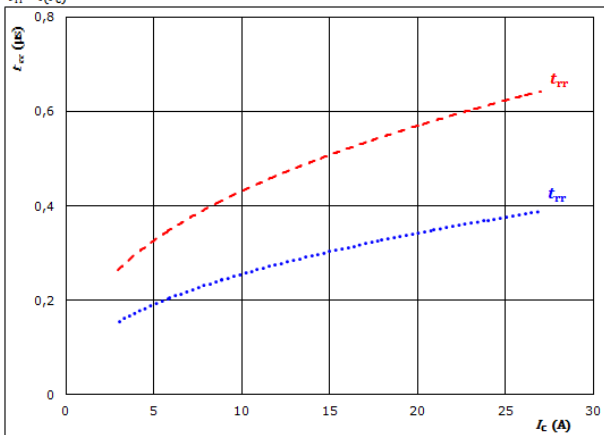
With an inductive load at

$T_J = 150$ °C
 $V_{CE} = 600$ V
 $V_{GE} = \pm 15$ V
 $I_C = 15$ A

Figure 7. FWD

Typical reverse recovery time as a function of collector current

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

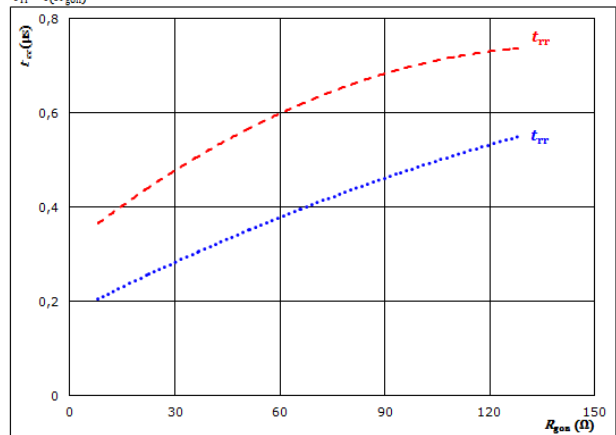


At $V_{CE} = 600$ V
 $V_{GE} = \pm 15$ V
 $R_{gon} = 32$ Ω
 T_J : 25 °C (blue dotted line)
 125 °C (black solid line)
 150 °C (red dashed line)

Figure 8. FWD

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

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



At $V_{CE} = 600$ V
 $V_{GE} = \pm 15$ V
 $I_C = 15$ A
 T_J : 25 °C (blue dotted line)
 125 °C (black solid line)
 150 °C (red dashed line)

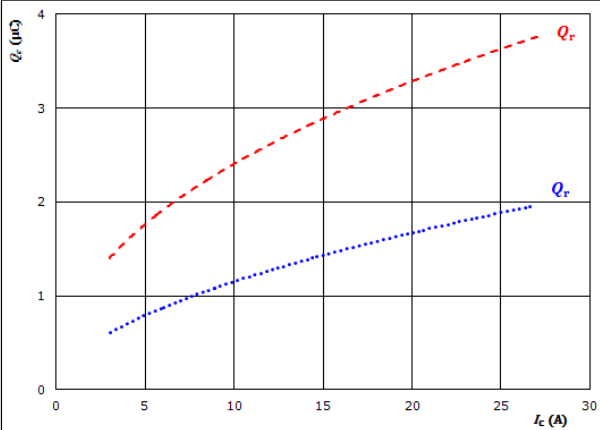


Inverter Switching Characteristics

Figure 9. FWD

Typical recovered charge as a function of collector current

$$Q_r = f(I_c)$$

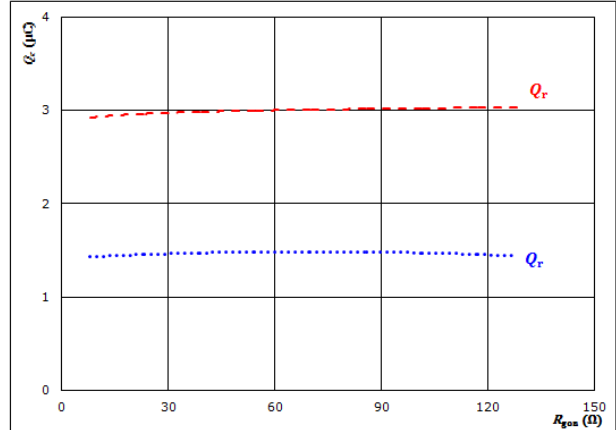


At $V_{CE} = 600$ V
 $V_{GE} = \pm 15$ V
 $R_{gon} = 32$ Ω
 T_j : 25 °C (dotted), 125 °C (solid), 150 °C (dashed)

Figure 10. FWD

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

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

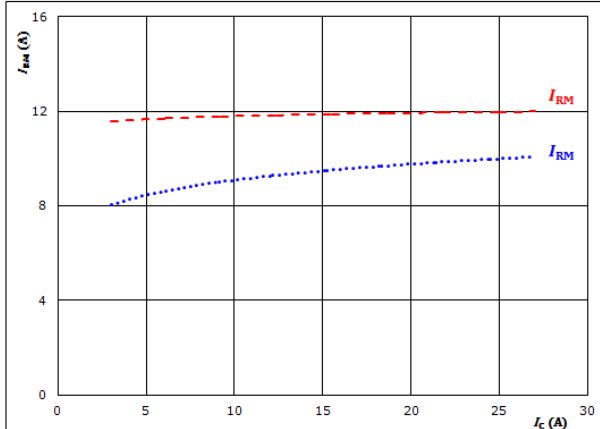


At $V_{CE} = 600$ V
 $V_{GE} = \pm 15$ V
 $I_c = 15$ A
 T_j : 25 °C (dotted), 125 °C (solid), 150 °C (dashed)

Figure 11. FWD

Typical peak reverse recovery current as a function of collector current

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

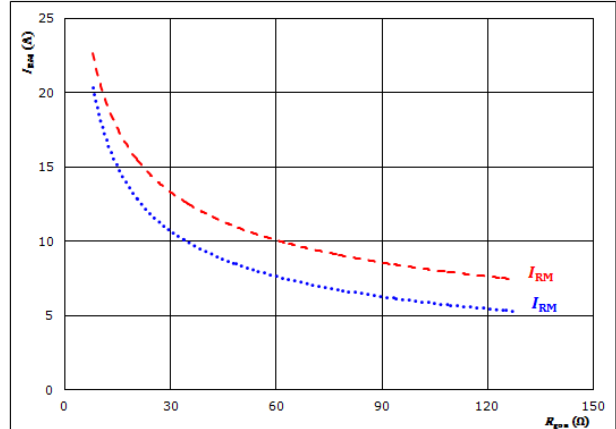


At $V_{CE} = 600$ V
 $V_{GE} = \pm 15$ V
 $R_{gon} = 32$ Ω
 T_j : 25 °C (dotted), 125 °C (solid), 150 °C (dashed)

Figure 12. FWD

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

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



At $V_{CE} = 600$ V
 $V_{GE} = \pm 15$ V
 $I_c = 15$ A
 T_j : 25 °C (dotted), 125 °C (solid), 150 °C (dashed)



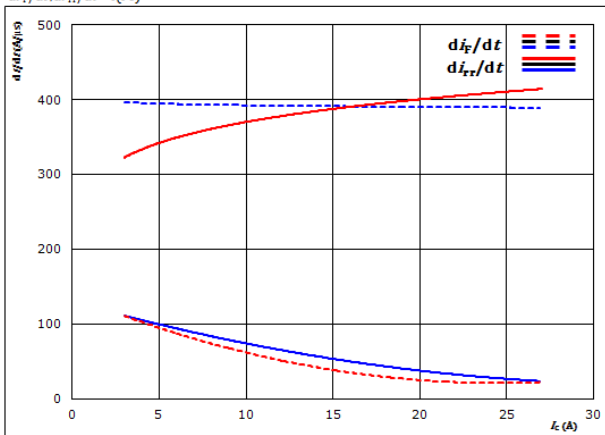
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Inverter Switching Characteristics

Figure 13. FWD

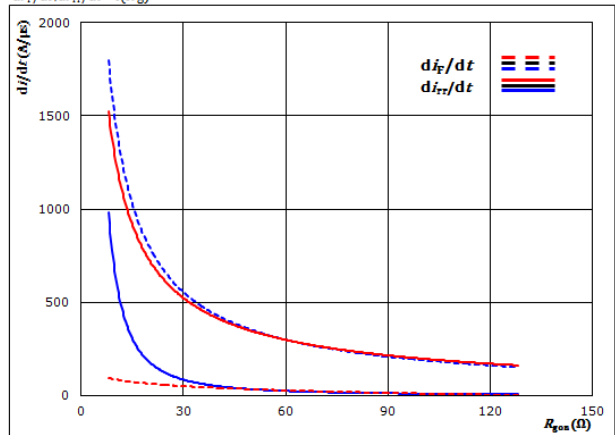
Typical rate of fall of forward and reverse recovery current as a function of collector current
 $di_F/dt, di_{rr}/dt = f(I_C)$



At $V_{CE} = 600$ V
 $V_{GE} = \pm 15$ V
 $R_{gon} = 32$ Ω
 T_j : 25 °C (dotted blue line)
 125 °C (solid black line)
 150 °C (dashed red line)

Figure 14. FWD

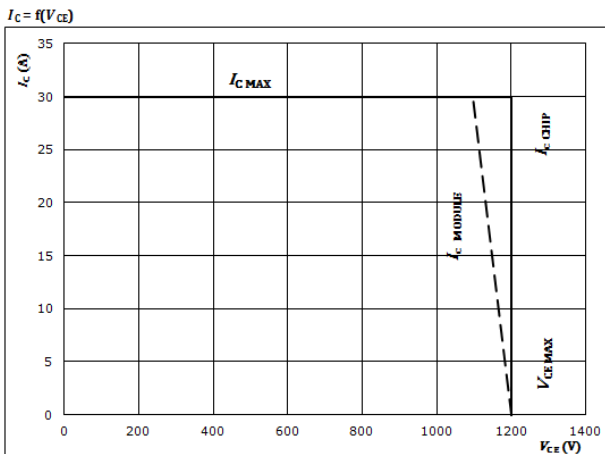
Typical rate of fall of forward and reverse recovery current as a function of IGBT turn on gate resistor
 $di_F/dt, di_{rr}/dt = f(R_{ge})$



At $V_{CE} = 600$ V
 $V_{GE} = \pm 15$ V
 $I_C = 15$ A
 T_j : 25 °C (dotted blue line)
 125 °C (solid black line)
 150 °C (dashed red line)

Figure 15. IGBT

Reverse bias safe operating area



At $T_j = 175$ °C
 $R_{gon} = 32$ Ω
 $R_{goff} = 32$ Ω



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Inverter Switching Definitions

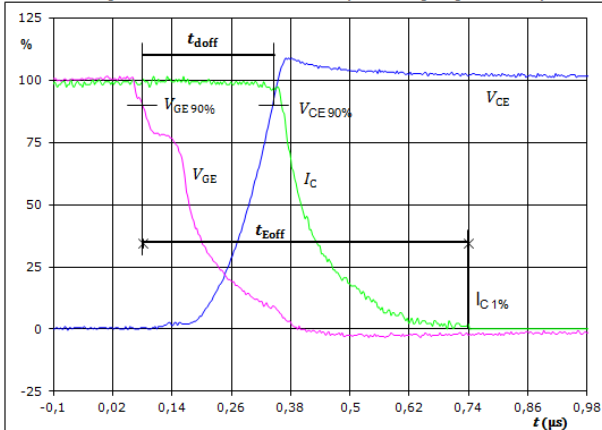
General conditions

T_j	=	150 °C
R_{gon}	=	32 Ω
R_{goff}	=	32 Ω

Figure 1.

IGBT

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

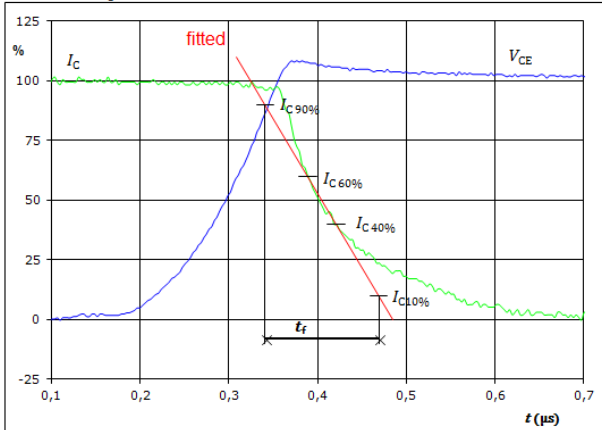


$V_{GE}(0\%) =$	-15	V
$V_{GE}(100\%) =$	15	V
$V_C(100\%) =$	600	V
$I_C(100\%) =$	15	A
$t_{doff} =$	0,264	μs
$t_{Eoff} =$	0,658	μs

Figure 3.

IGBT

Turn-off Switching Waveforms & definition of t_f

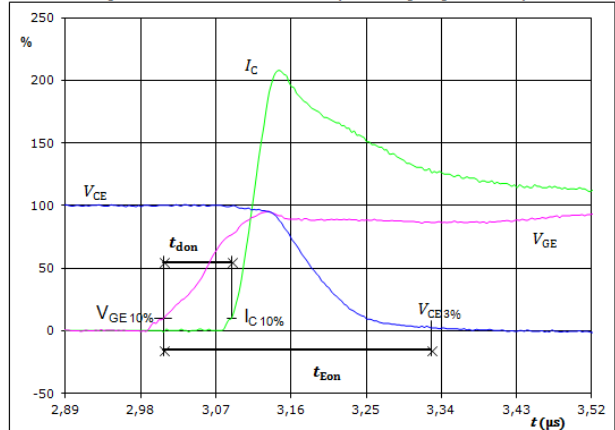


$V_C(100\%) =$	600	V
$I_C(100\%) =$	15	A
$t_f =$	0,129	μs

Figure 2.

IGBT

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

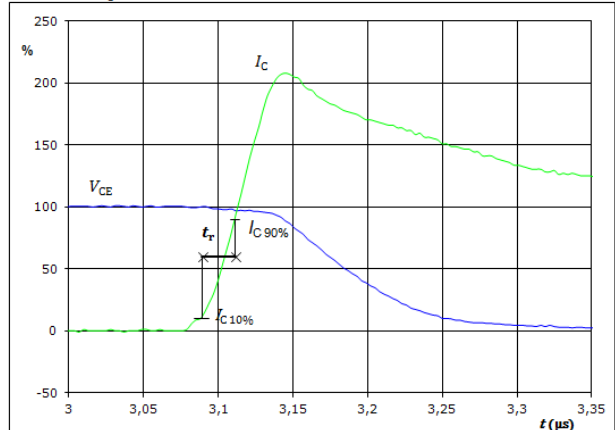


$V_{GE}(0\%) =$	-15	V
$V_{GE}(100\%) =$	15	V
$V_C(100\%) =$	600	V
$I_C(100\%) =$	15	A
$t_{don} =$	0,084	μs
$t_{Eon} =$	0,321	μs

Figure 4.

IGBT

Turn-on Switching Waveforms & definition of t_r



$V_C(100\%) =$	600	V
$I_C(100\%) =$	15	A
$t_r =$	0,024	μs



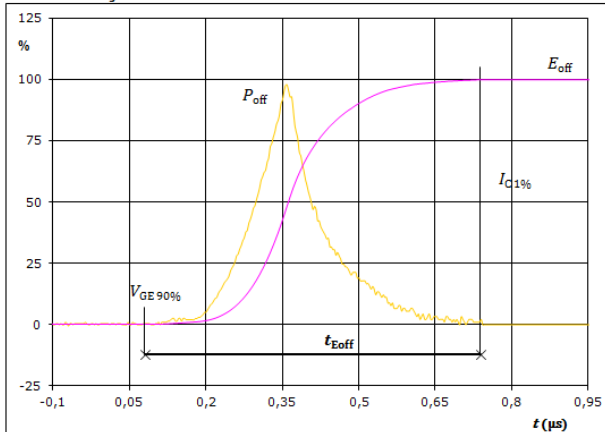
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 datasheet

Inverter Switching Definitions

Figure 5. IGBT

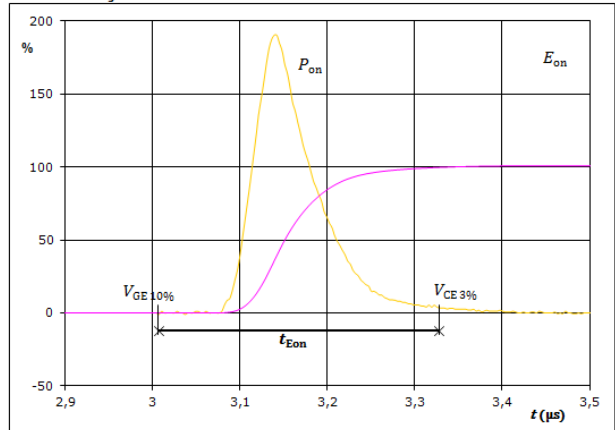
Turn-off Switching Waveforms & definition of t_{Eoff}



$P_{\text{off}}(100\%) = 9,03$ kW
 $E_{\text{off}}(100\%) = 1,37$ mJ
 $t_{\text{Eoff}} = 0,66$ μs

Figure 6. IGBT

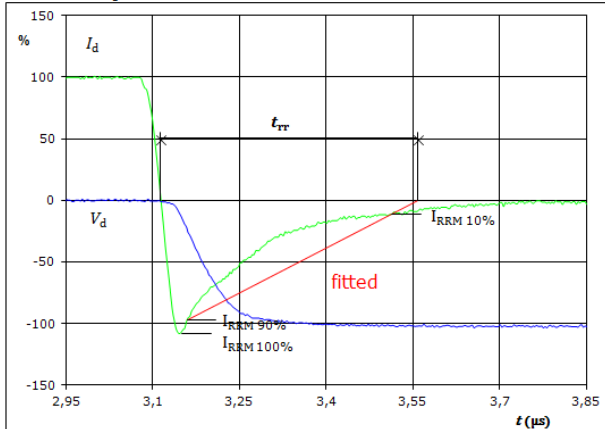
Turn-on Switching Waveforms & definition of t_{Eon}



$P_{\text{on}}(100\%) = 9,03$ kW
 $E_{\text{on}}(100\%) = 1,40$ mJ
 $t_{\text{Eon}} = 0,32$ μs

Figure 7. FWD

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



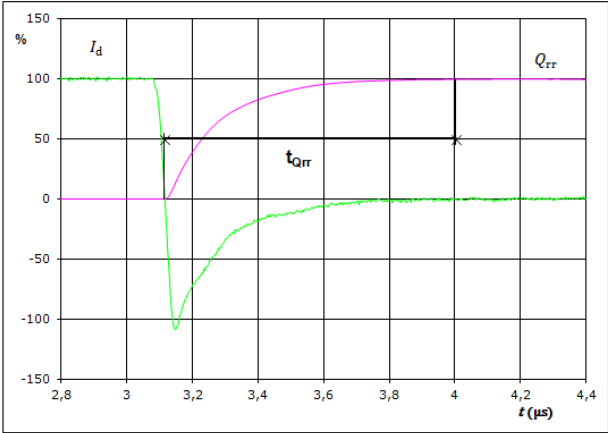
$V_d(100\%) = 600$ V
 $I_d(100\%) = 15$ A
 $I_{\text{RRM}}(100\%) = -16$ A
 $t_{\text{tr}} = 0,447$ μs



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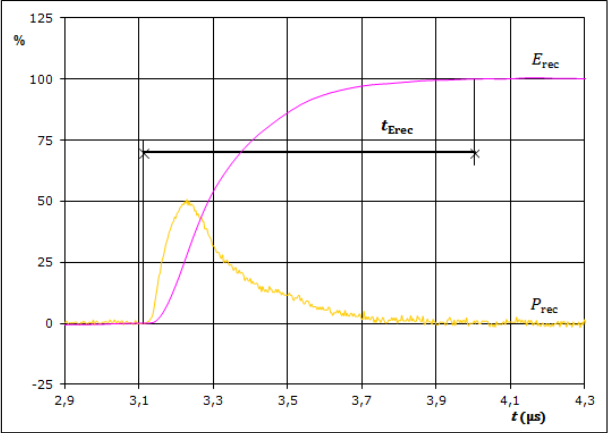
Inverter Switching Definitions

Figure 8. FWD
 Turn-on Switching Waveforms & definition of t_{Qrr} (t_{Qrr} = integrating time for Q_d)



$I_d(100\%) = 15$ A
 $Q_{rr}(100\%) = 2,68$ μ C
 $t_{Qrr} = 0,89$ μ s

Figure 9. FWD
 Turn-on Switching Waveforms & definition of t_{Erec} (t_{Erec} = integrating time for E_{rec})



$P_{rec}(100\%) = 9,03$ kW
 $E_{rec}(100\%) = 1,08$ mJ
 $t_{Erec} = 0,89$ μ s



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Brake Switching Characteristics

Figure 1. IGBT
Typical switching energy losses as a function of collector current

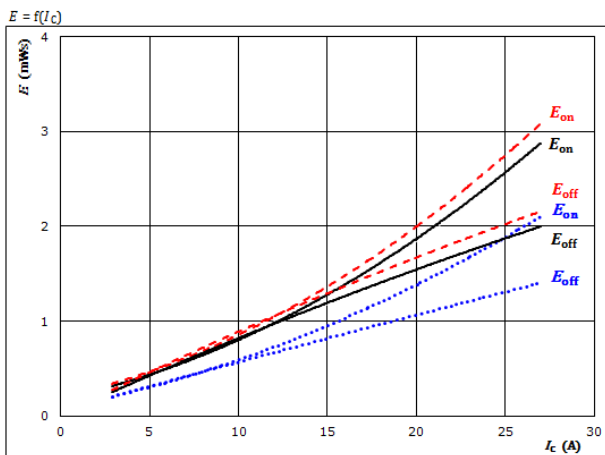


Figure 2. IGBT
Typical switching energy losses as a function of gate resistor

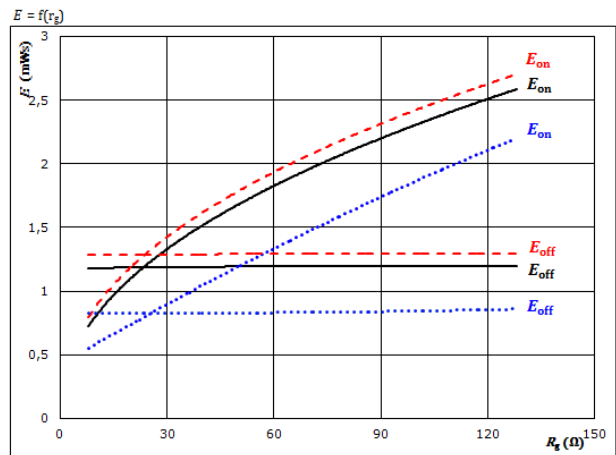


Figure 3. FWD
Typical reverse recovered energy loss as a function of collector current

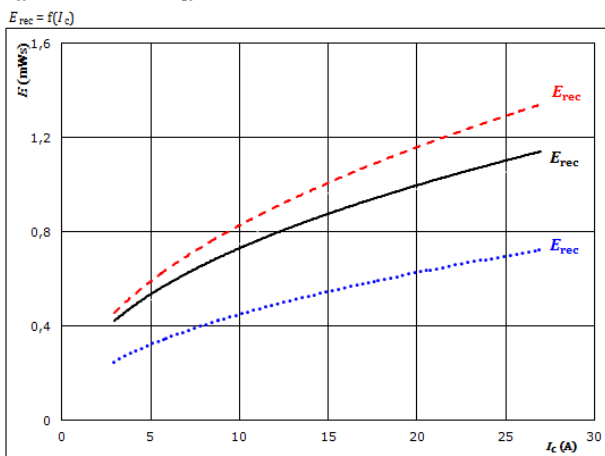
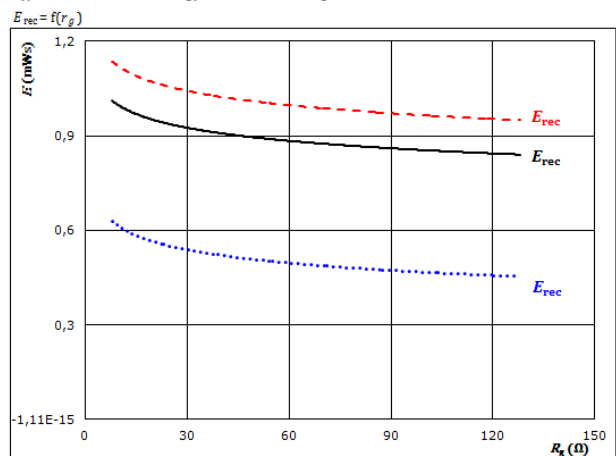


Figure 4. FWD
Typical reverse recovered energy loss as a function of gate resistor





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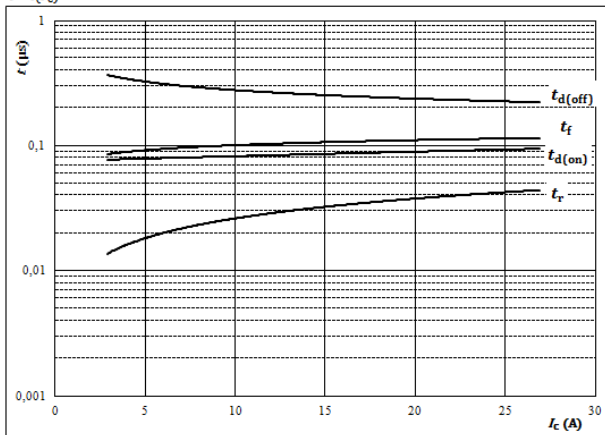
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 datasheet

Brake Switching Characteristics

Figure 5. IGBT

Typical switching times as a function of collector current

$$t = f(I_C)$$



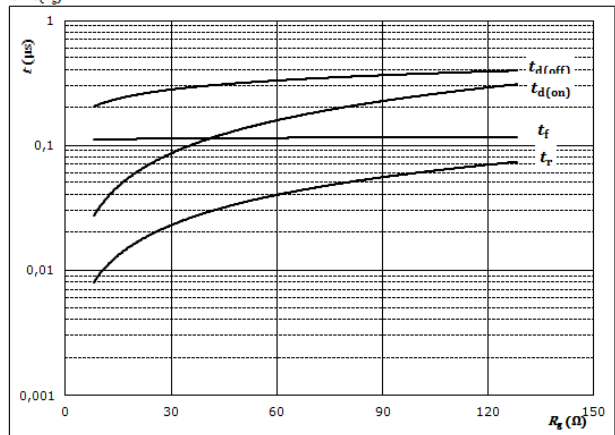
With an inductive load at

$T_J = 150$ °C
 $V_{CE} = 600$ V
 $V_{GE} = \pm 15$ V
 $R_{gon} = 32$ Ω
 $R_{goff} = 32$ Ω

Figure 6. IGBT

Typical switching times as a function of gate resistor

$$t = f(R_g)$$



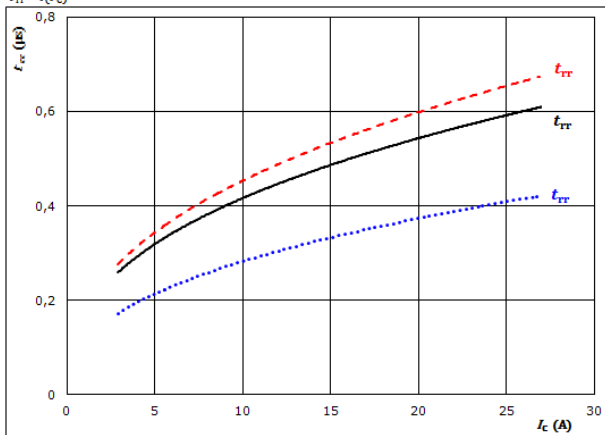
With an inductive load at

$T_J = 150$ °C
 $V_{CE} = 600$ V
 $V_{GE} = \pm 15$ V
 $I_C = 15$ A

Figure 7. FWD

Typical reverse recovery time as a function of collector current

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

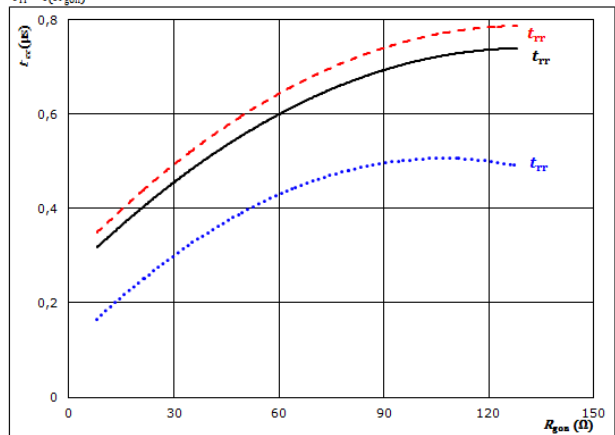


At $V_{CE} = 600$ V
 $V_{GE} = \pm 15$ V
 $R_{gon} = 32$ Ω
 $T_J: 25$ °C
 125 °C ———
 150 °C - - - -

Figure 8. FWD

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

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



At $V_{CE} = 600$ V
 $V_{GE} = \pm 15$ V
 $I_C = 15$ A
 $T_J: 25$ °C
 125 °C ———
 150 °C - - - -



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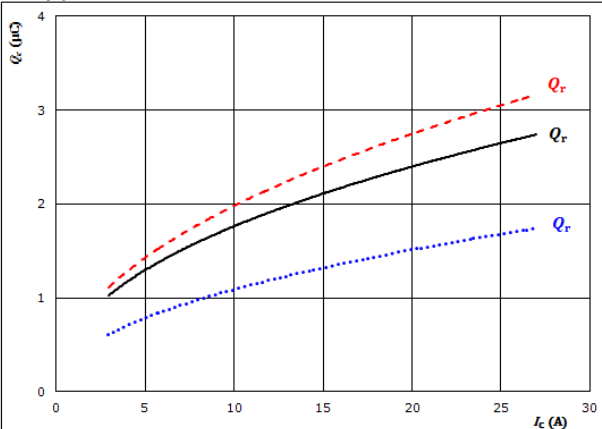
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datasheet

Brake Switching Characteristics

Figure 9. FWD

Typical recovered charge as a function of collector current

$$Q_r = f(I_c)$$

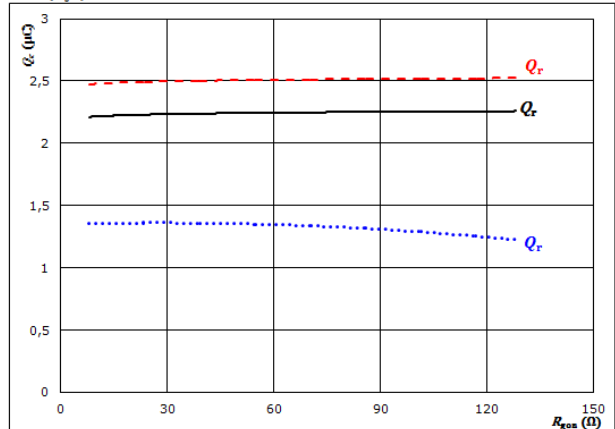


At $V_{CE} = 600$ V
 $V_{GE} = \pm 15$ V
 $R_{gon} = 32$ Ω
 T_j : 25 °C
125 °C ———
150 °C - - - - -

Figure 10. FWD

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

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

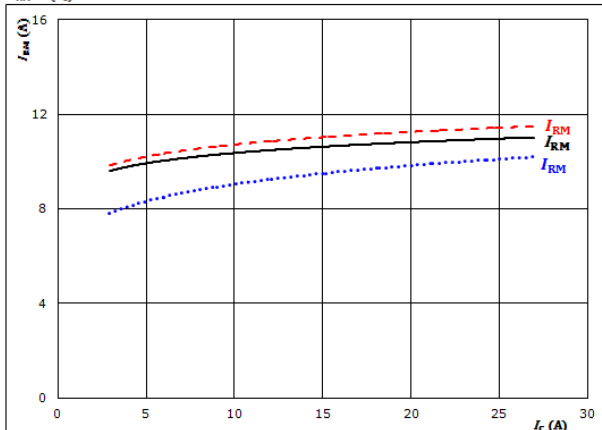


At $V_{CE} = 600$ V
 $V_{GE} = \pm 15$ V
 $I_c = 15$ A
 T_j : 25 °C
125 °C ———
150 °C - - - - -

Figure 11. FWD

Typical peak reverse recovery current as a function of collector current

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

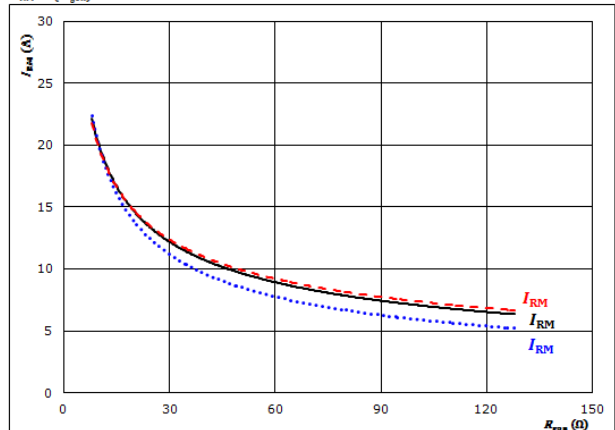


At $V_{CE} = 600$ V
 $V_{GE} = \pm 15$ V
 $R_{gon} = 32$ Ω
 T_j : 25 °C
125 °C ———
150 °C - - - - -

Figure 12. FWD

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

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



At $V_{CE} = 600$ V
 $V_{GE} = \pm 15$ V
 $I_c = 15$ A
 T_j : 25 °C
125 °C ———
150 °C - - - - -



Brake Switching Characteristics

Figure 13. FWD

Typical rate of fall of forward and reverse recovery current as a function of collector current
 $di_F/dt, di_{rr}/dt = f(I_C)$

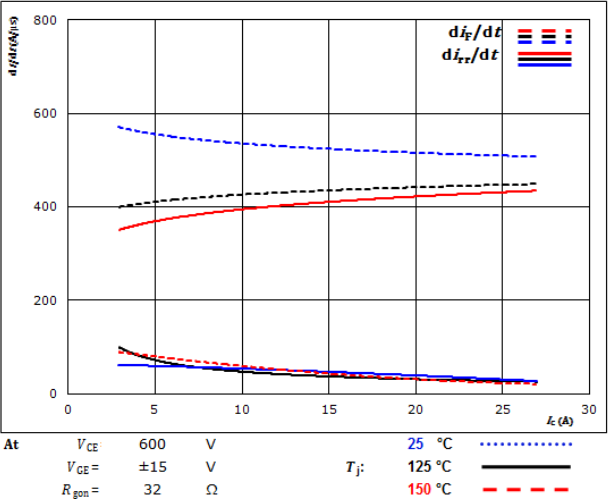


Figure 15. IGBT

Reverse bias safe operating area

$I_C = f(V_{CE})$

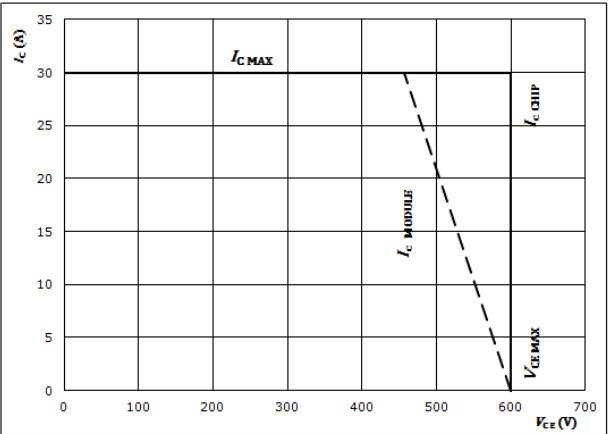
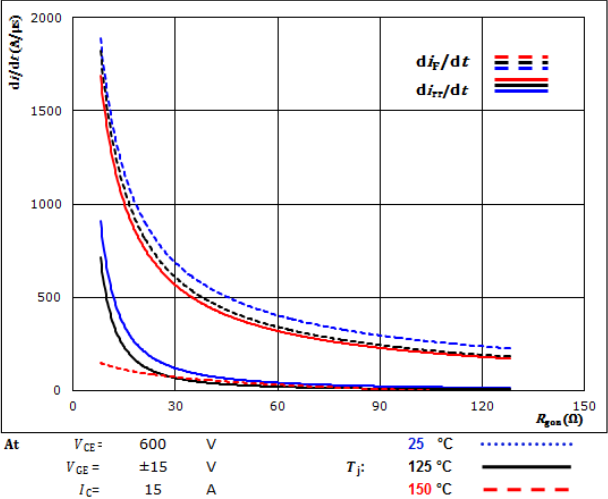


Figure 14. FWD

Typical rate of fall of forward and reverse recovery current as a function of IGBT turn on gate resistor
 $di_F/dt, di_{rr}/dt = f(R_g)$





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Brake Switching Definitions

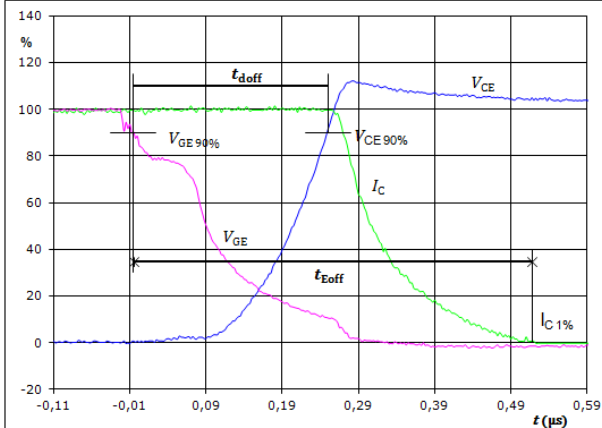
General conditions

T_j	=	150 °C
R_{gon}	=	32 Ω
R_{goff}	=	32 Ω

Figure 1.

IGBT

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

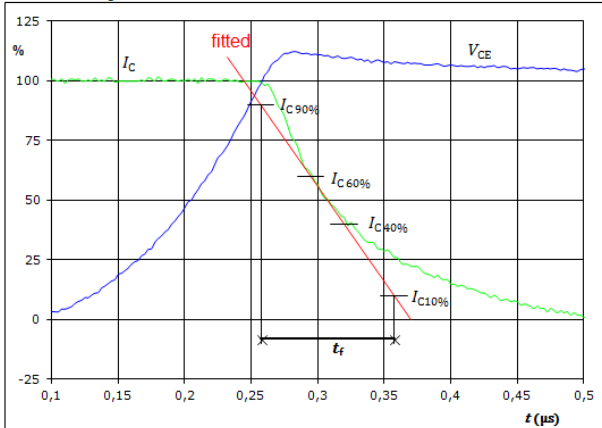


$V_{GE}(0\%) =$	-15	V
$V_{GE}(100\%) =$	15	V
$V_C(100\%) =$	600	V
$I_C(100\%) =$	15	A
$t_{doff} =$	0,258	μs
$t_{Eoff} =$	0,523	μs

Figure 3.

IGBT

Turn-off Switching Waveforms & definition of t_f

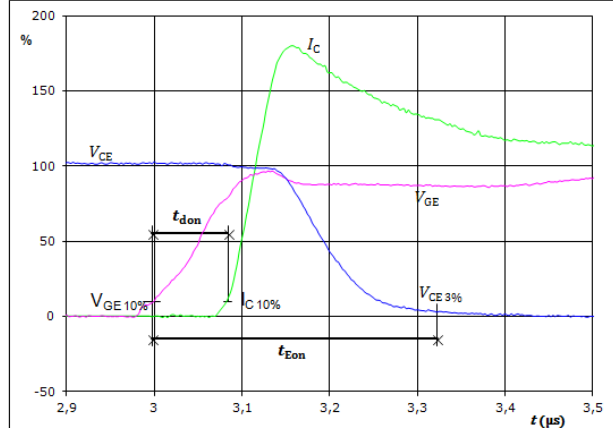


$V_C(100\%) =$	600	V
$I_C(100\%) =$	15	A
$t_f =$	0,111	μs

Figure 2.

IGBT

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

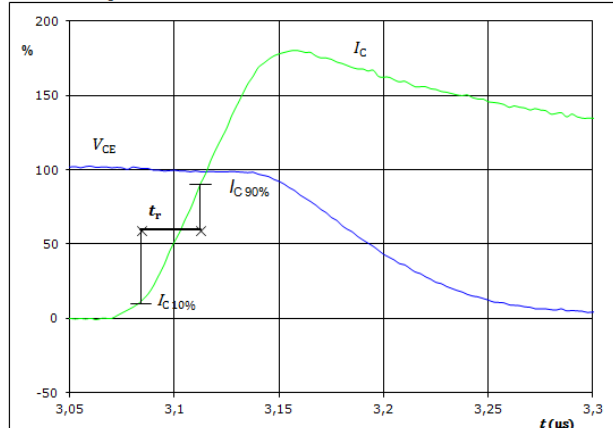


$V_{GE}(0\%) =$	-15	V
$V_{GE}(100\%) =$	15	V
$V_C(100\%) =$	600	V
$I_C(100\%) =$	15	A
$t_{don} =$	0,088	μs
$t_{Eon} =$	0,325	μs

Figure 4.

IGBT

Turn-on Switching Waveforms & definition of t_r



$V_C(100\%) =$	600	V
$I_C(100\%) =$	15	A
$t_r =$	0,029	μs



Brake Switching Characteristics

Figure 5. IGBT

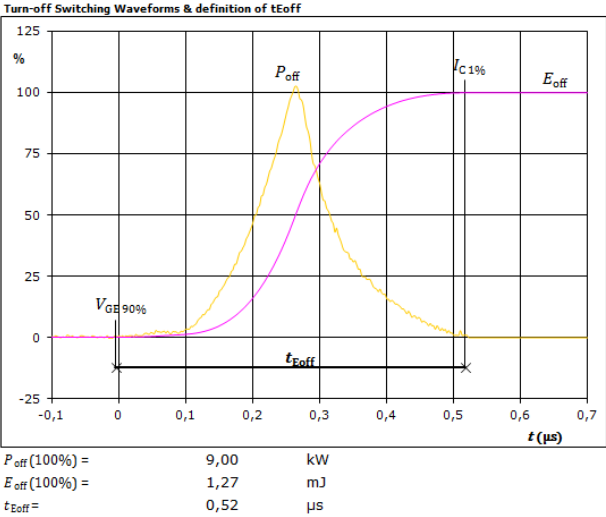


Figure 6. IGBT

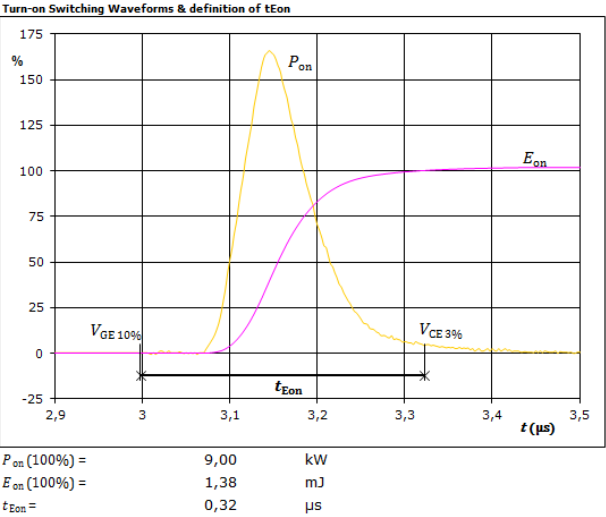
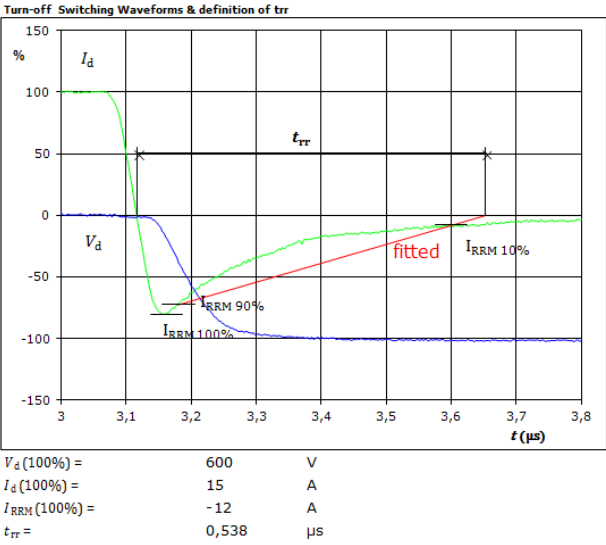


Figure 7. FWD





Brake Switching Characteristics

Figure 8. FWD
Turn-on Switching Waveforms & definition of t_{Qrr} (t_{Qrr} = integrating time for Q_{rr})

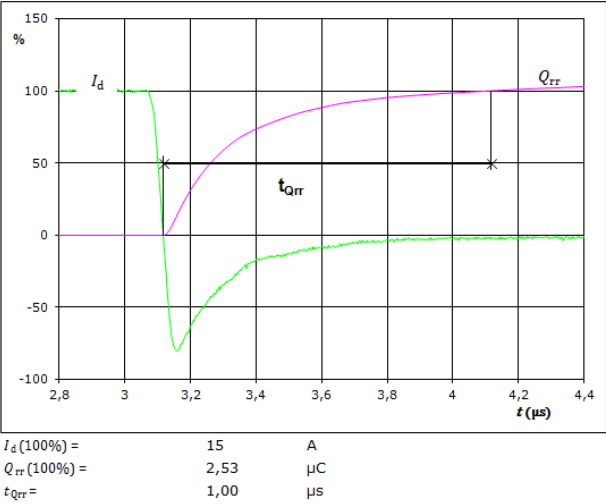
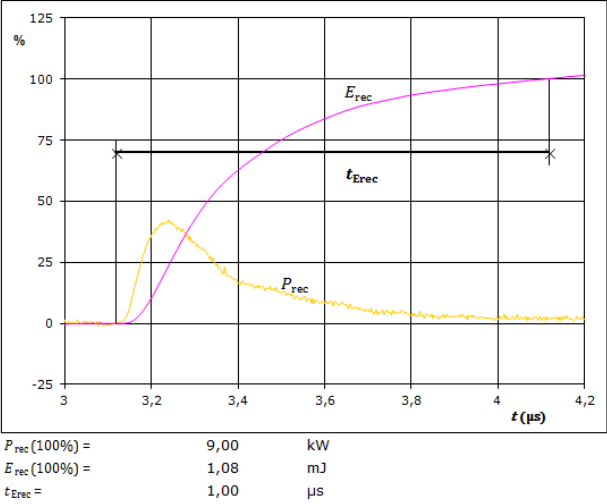


Figure 9. FWD
Turn-on Switching Waveforms & definition of t_{Erec} (t_{Erec} = integrating time for E_{rec})

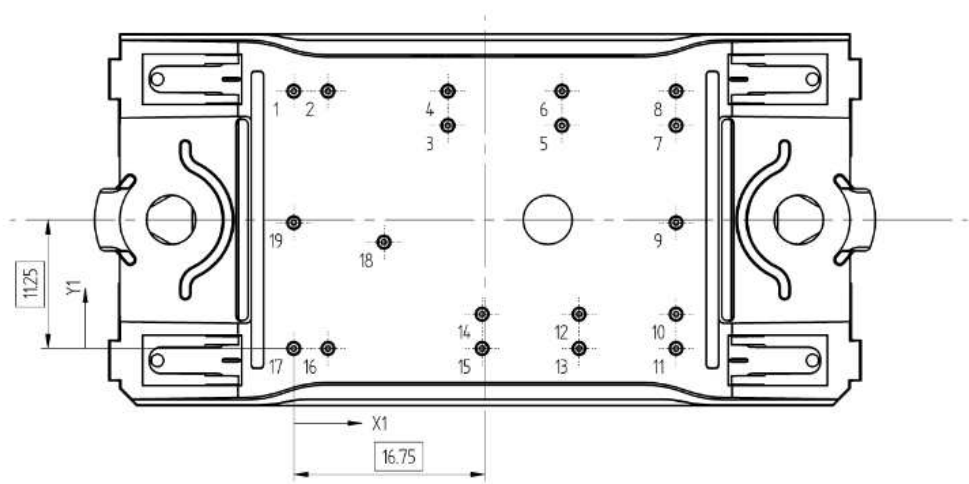




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10-FZ127PA015SC-L158E08
10-F0127PA015SC-L158E09
 datasheet

Ordering Code & Marking						
Version	Ordering Code		in DataMatrix as		in packaging barcode as	
without thermal paste 17mm housing	10-F0127PA015SC-L158E09		L158E09		L158E09	
without thermal paste 12mm housing	10-FZ127PA015SC-L158E08		L158E08		L158E08	
NN-NNNNNNNNNNNN NNNNNNNN WWYY UL Vinco LLLLL SSSS		Text	Name		Date code	UL & Vinco
			NN-NNNNNNNNNNNNNNNNNNNNNNNNNNNNNN		WWYY	UL Vinco
		Datamatrix	Type	Lot number	Serial	Date code
			TTTT-TTT	LLLLL	SSSS	WWYY

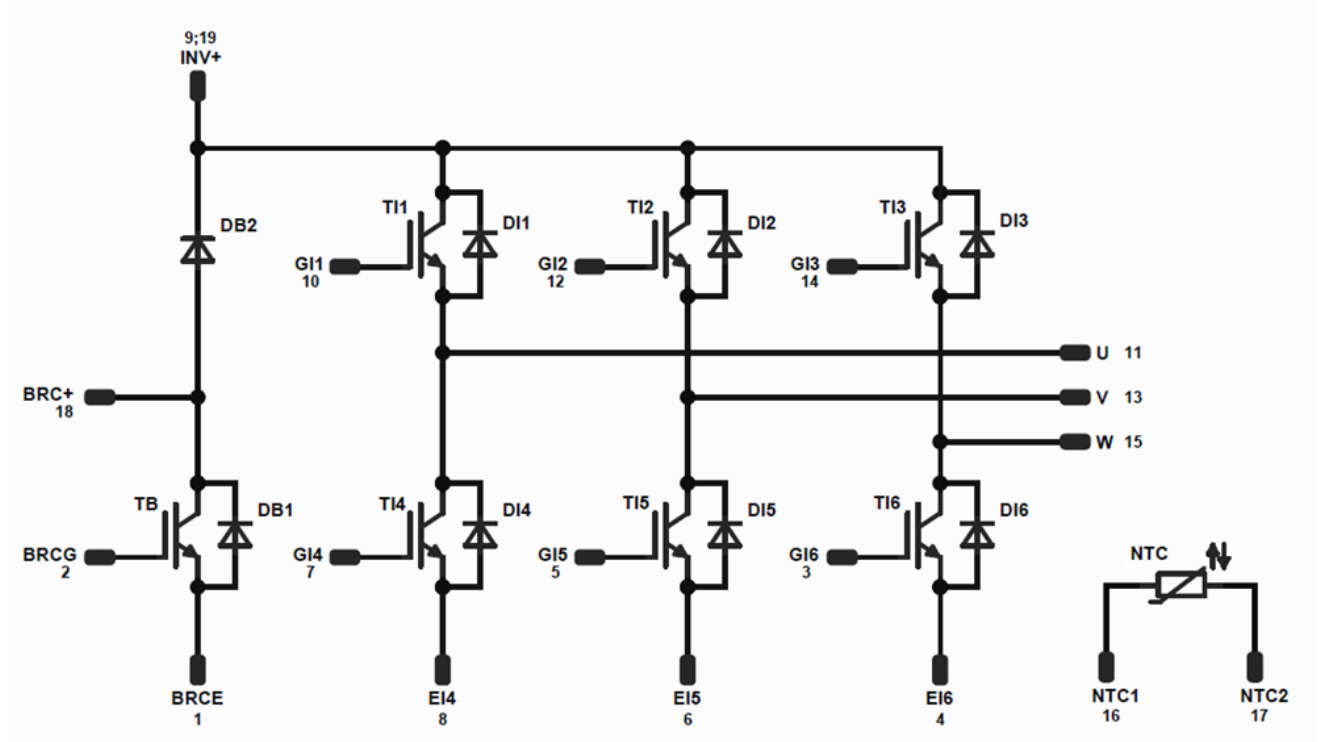
Pin table [mm]				Outline	
Pin	X	Y	Function		
1	0	22,5	BRCE		
2	3	22,5	BRCG		
3	13,5	19,5	GI6		
4	13,5	22,5	EI6		
5	23,5	19,5	GI5		
6	23,5	22,5	EI5		
7	33,5	19,5	GI4		
8	33,5	22,5	EI4		
9	33,5	11	INV+		
10	33,5	3	GI1		
11	33,5	0	U		
12	25	3	GI2		
13	25	0	V		
14	16,5	3	GI3		
15	16,5	0	W		
16	3	0	NTC1		
17	0	0	NTC2		
18	7,9	9,3	BRC+		
19	0	11	INV+		



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10-FZ127PA015SC-L158E08
10-F0127PA015SC-L158E09
datasheet

Pinout



Identification

ID	Component	Voltage	Current	Function	Comment
TI1, TI2, TI3, TI4, TI5, TI6	IGBT	1200V	15A	Inverter Switch	
DI1, DI2, DI3, DI4, DI5, DI6	FWD	1200V	15A	Inverter Diode	
TB	IGBT	1200V	15A	Brake Switch	
DB2	FWD	1200V	10A	Brake Diode	
DB1	FWD	1200V	3A	Brake Inverse Diode	
NTC	NTC	-	-	Thermistor	



Packaging instruction			
Standard packaging quantity (SPQ)	135	>SPQ	Standard
		<SPQ	Sample
Handling instruction			
Handling instructions for <i>flow</i> 0 packages see vincotech.com website.			
Package data			
Package data for <i>flow</i> 0 packages see vincotech.com website.			

Document No.:	Date:	Modification:	Pages
10-Fx127PA015SC-L158E0x-D4-14	23 Jul. 2015	New outline drawing	26

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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.