



Vincotech

30-EX14B2A007WS01-PS29F28Z

target datasheet

flowBOOST E3BP dual

1400 V / 6,67 mΩ

Topology features

- Kelvin Emitter for improved switching performance
- Temperature sensor
- Gate Resistor
- MOSFET
- Dual Flying Cap Booster
- Auxiliary diodes for FC pre-charge (patent pending)

Component features

- Easy paralleling
- Fast switching speed
- Low on-resistance

Housing features

- Base isolation: Al₂O₃
- Cu baseplate
- Convex shaped baseplate for superior thermal contact
- CTI600 housing material
- Baseplate with rough surface
- Solder pin
- Thermo-mechanical push-and-pull force relief

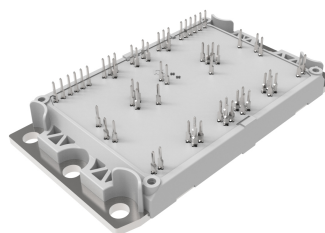
Target applications

- Solar Inverters

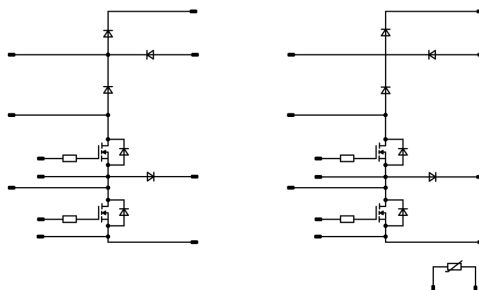
Types

- 30-EX14B2A007WS01-PS29F28Z

flow E3BP 15 mm housing



Schematic





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Maximum Ratings

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

Parameter	Symbol	Conditions	Value	Unit
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Inner Boost Switch

Drain-source voltage	V_{DS}		1400	V
Drain current (DC current)	I_D	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	135	A
Peak drain current	I_{DM}		TBD	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	240	W
Gate-source voltage	V_{GS}	static	-10 / 22	V
		dynamic	-11 / 25	V
Maximum Junction Temperature	T_{jmax}		175	°C

Inner Boost Diode

Peak repetitive reverse voltage	V_{RRM}		1400	V
Forward current (DC current)	I_F	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	163	A
Repetitive peak forward current	I_{FRM}	t_p limited by T_{jmax}	948	A
Surge (non-repetitive) forward current	I_{FSM}	Single Half Sine Wave, $t_p = 10\text{ ms}$ $T_j = 25\text{ °C}$	1800	A
Surge current capability	I^2t		16192	A ² s
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	313	W
Maximum junction temperature	T_{jmax}		175	°C

Inner Boost Sw. Protection Diode

Peak repetitive reverse voltage	V_{RRM}		1600	V
Forward current (DC current)	I_F	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	116	A
Surge (non-repetitive) forward current	I_{FSM}	Single Half Sine Wave, $t_p = 10\text{ ms}$ $T_j = 150\text{ °C}$	600	A
Surge current capability	I^2t		1800	A ² s
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	146	W
Maximum junction temperature	T_{jmax}		175	°C



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Maximum Ratings

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

Parameter	Symbol	Conditions	Value	Unit
Outer Boost Switch				
Drain-source voltage	V_{DS}		1400	V
Drain current (DC current)	I_D	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	135	A
Peak drain current	I_{DM}		TBD	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	240	W
Gate-source voltage	V_{GS}	static	-10 / 22	V
		dynamic	-11 / 25	V
Maximum Junction Temperature	T_{jmax}		175	°C

Outer Boost Diode

Peak repetitive reverse voltage	V_{RRM}		1400	V
Forward current (DC current)	I_F	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	163	A
Repetitive peak forward current	I_{FRM}	t_p limited by T_{jmax}	948	A
Surge (non-repetitive) forward current	I_{FSM}	Single Half Sine Wave, $t_p = 10\text{ ms}$ $T_j = 25\text{ °C}$	1800	A
Surge current capability	I^2t		16192	A²s
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	313	W
Maximum junction temperature	T_{jmax}		175	°C

Outer Boost Sw. Protection Diode

Peak repetitive reverse voltage	V_{RRM}		1600	V
Forward current (DC current)	I_F	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	116	A
Surge (non-repetitive) forward current	I_{FSM}	Single Half Sine Wave, $t_p = 10\text{ ms}$ $T_j = 150\text{ °C}$	600	A
Surge current capability	I^2t		1800	A²s
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	146	W
Maximum junction temperature	T_{jmax}		175	°C



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Maximum Ratings

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

Parameter	Symbol	Conditions	Value	Unit
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Aux Diode H

Peak repetitive reverse voltage	V_{RRM}		1400	V
Forward current (DC current)	I_F	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	73	A
Repetitive peak forward current	I_{FRM}	t_p limited by T_{jmax}	280	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	150	W
Maximum junction temperature	T_{jmax}		175	°C

Aux Diode L

Peak repetitive reverse voltage	V_{RRM}		1400	V
Forward current (DC current)	I_F	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	77	A
Repetitive peak forward current	I_{FRM}	t_p limited by T_{jmax}	501	A
Surge (non-repetitive) forward current	I_{FSM}	Single Half Sine Wave, $t_p = 10\text{ ms}$ $T_j = 25\text{ °C}$	657	A
Surge current capability	I^2t		2151	A²s
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	167	W
Maximum junction temperature	T_{jmax}		175	°C

Resistor (Gate)

DC current	I	terminal temperature $T_k = 90\text{ °C}$	1060	mA
Power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	0,75	W
Operation Temperature	T_{op}		-55 ... 155	°C



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Maximum Ratings

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

Parameter	Symbol	Conditions	Value	Unit
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Module Properties

Thermal Properties

Storage temperature	T_{stg}		-40...+125	°C
Operation temperature under switching condition	T_{jop}		-40...+(T_{jmax} - 25)	°C

Isolation Properties

Isolation voltage	V_{isol}	DC Test Voltage* $t_p = 2\text{ s}$	6800	V
Creepage distance			12,56	mm
Clearance			11,81	mm
Comparative Tracking Index	CTI		≥ 600	

*100 % tested in production



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Characteristic Values

Parameter	Symbol	Conditions					Values			Unit
			V_{GE} [V] V_{GS} [V]	V_{CE} [V] V_{DS} [V] V_F [V]	I_C [A] I_D [A] I_F [A]	T_j [°C]	Min	Typ	Max	

Inner Boost Switch

Static

Drain-source on-state resistance	$r_{DS(on)}$		18		180	25 125 150		6,65 10,8 12,4	8,67 ⁽¹⁾	mΩ
Gate-source threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$			0,06	25	1,8	3	4,2	V
Gate to Source Leakage Current	I_{GSS}		22	0		25		3	750	nA
Zero Gate Voltage Drain Current	I_{DSS}		0	1400		25		3	300	μA
Internal gate resistance	r_g							None		Ω
Short-circuit input capacitance	C_{iss}							TBD		
Diode forward voltage	V_{SD}		0		180	25		4,5		V

Thermal

Thermal resistance junction to sink ⁽²⁾	$R_{th(j-s)}$	$\lambda_{paste} = 5,2 \text{ W/mK}$ (PTM)						0,4		K/W
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Dynamic

Turn-on delay time	$t_{d(on)}$	$R_{gon} = 1 \text{ } \Omega$ $R_{goff} = 1 \text{ } \Omega$	-5/18	800	150	25 125 150		25,15 23,6 23,21		ns
Rise time	t_r					25 125 150		8,52 7,97 7,94		ns
Turn-off delay time	$t_{d(off)}$					25 125 150		67,04 75,13 77,85		ns
Fall time	t_f					25 125 150		8,81 10,43 11,02		ns
Turn-on energy (per pulse)	E_{on}					25 125 150		0,427 0,412 0,398		mWs
Turn-off energy (per pulse)	E_{off}					25 125 150		0,521 0,62 0,619		mWs



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Characteristic Values

Parameter	Symbol	Conditions					Values			Unit
			V_{GE} [V] V_{GS} [V]	V_{CE} [V] V_{DS} [V] V_F [V]	I_C [A] I_D [A] I_F [A]	T_j [°C]	Min	Typ	Max	

Inner Boost Diode

Static

Forward voltage	V_F				160	25 125 150		1,41 1,73 1,86	1,6 ⁽¹⁾	V
Reverse leakage current	I_R	$V_i = 1400$ V				25		20	640	µA

Thermal

Thermal resistance junction to sink ⁽²⁾	$R_{th(j-s)}$	$\lambda_{paste} = 5,2$ W/mK (PTM)						0,3		K/W
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Dynamic

Peak recovery current	I_{RM}	$di/dt=17234$ A/µs $di/dt=19280$ A/µs $di/dt=18771$ A/µs	-5/18	800	150	25 125 150		147,3 144,26 144,78		A
Reverse recovery time	t_{rr}					25 125 150		19,66 20,02 20,1		ns
Recovered charge	Q_r					25 125 150		1,52 1,54 1,53		µC
Reverse recovered energy	E_{rec}					25 125 150		0,609 0,613 0,606		mWs
Peak rate of fall of recovery current	$(di_{rr}/dt)_{max}$					25 125 150		29106,21 27706,05 25638,68		A/µs



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target datasheet

Characteristic Values

Parameter	Symbol	Conditions					Values			Unit
			V_{GE} [V] V_{GS} [V]	V_{CE} [V] V_{DS} [V] V_F [V]	I_C [A] I_D [A] I_F [A]	T_j [°C]	Min	Typ	Max	

Inner Boost Sw. Protection Diode

Static

Forward voltage	V_F				50	25 125 150		1,06 0,991 0,977	1,5 ⁽¹⁾	V
Reverse leakage current	I_R	$V_i = 1600$ V				25 150			50 1500	μA

Thermal

Thermal resistance junction to sink ⁽²⁾	$R_{th(j-s)}$	$\lambda_{paste} = 5,2$ W/mK (PTM)						0,65		K/W
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Characteristic Values

Parameter	Symbol	Conditions					Values			Unit
			V_{GE} [V] V_{GS} [V]	V_{CE} [V] V_{DS} [V] V_F [V]	I_C [A] I_D [A] I_F [A]	T_j [°C]	Min	Typ	Max	

Outer Boost Switch

Static

Drain-source on-state resistance	$r_{DS(on)}$		18		180	25 125 150		6,65 10,8 12,4	8,67 ⁽¹⁾	mΩ
Gate-source threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$			0,06	25	1,8	3	4,2	V
Gate to Source Leakage Current	I_{GSS}		22	0		25		3	750	nA
Zero Gate Voltage Drain Current	I_{DSS}		0	1400		25		3	300	μA
Internal gate resistance	r_g							None		Ω
Short-circuit input capacitance	C_{iss}							TBD		
Diode forward voltage	V_{SD}		0		180	25		4,5		V

Thermal

Thermal resistance junction to sink ⁽²⁾	$R_{th(j-s)}$	$\lambda_{paste} = 5,2 \text{ W/mK}$ (PTM)						0,4		K/W
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Dynamic

Turn-on delay time	$t_{d(on)}$	$R_{gon} = 1 \Omega$ $R_{goff} = 1 \Omega$	-5/18	800	150	25 125 150		25,15 23,6 23,21		ns
Rise time	t_r					25 125 150		8,52 7,97 7,94		ns
Turn-off delay time	$t_{d(off)}$					25 125 150		67,04 75,13 77,85		ns
Fall time	t_f					25 125 150		8,81 10,43 11,02		ns
Turn-on energy (per pulse)	E_{on}					25 125 150		0,427 0,412 0,398		mWs
Turn-off energy (per pulse)	E_{off}					25 125 150		0,521 0,62 0,619		mWs



Characteristic Values

Parameter	Symbol	Conditions					Values			Unit
			V_{GE} [V] V_{GS} [V]	V_{CE} [V] V_{DS} [V] V_F [V]	I_C [A] I_D [A] I_F [A]	T_j [°C]	Min	Typ	Max	
Outer Boost Diode										
Static										
Forward voltage	V_F				160	25 125 150		1,41 1,73 1,86	1,6 ⁽¹⁾	V
Reverse leakage current	I_R	$V_r = 1400$ V				25		20	640	µA
Thermal										
Thermal resistance junction to sink ⁽²⁾	$R_{th(j-s)}$	$\lambda_{paste} = 5,2$ W/mK (PTM)						0,3		K/W
Dynamic										
Peak recovery current	I_{RM}	$di/dt=17234$ A/µs $di/dt=19280$ A/µs $di/dt=18771$ A/µs	-5/18	800	150	25 125 150		147,3 144,26 144,78		A
Reverse recovery time	t_{rr}					25 125 150		19,66 20,02 20,1		ns
Recovered charge	Q_r					25 125 150		1,52 1,54 1,53		µC
Reverse recovered energy	E_{rec}					25 125 150		0,609 0,613 0,606		mWs
Peak rate of fall of recovery current	$(di_{rr}/dt)_{max}$					25 125 150		29106,21 27706,05 25638,68		A/µs



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Characteristic Values

Parameter	Symbol	Conditions						Values			Unit
			V_{GE} [V] V_{GS} [V]	V_{CE} [V] V_{DS} [V] V_F [V]	I_C [A] I_D [A] I_F [A]	T_j [°C]		Min	Typ	Max	

Outer Boost Sw. Protection Diode

Static

Forward voltage	V_F				50	25 125 150		1,06 0,991 0,977	1,5 ⁽¹⁾		V
Reverse leakage current	I_R	$V_r = 1600$ V				25 150			50 1500		μA

Thermal

Thermal resistance junction to sink ⁽²⁾	$R_{th(j-s)}$	$\lambda_{paste} = 5,2$ W/mK (PTM)						0,65			K/W
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Aux Diode H

Static

Forward voltage	V_F				140	25 125 150		3 2,85 2,78	4,5 ⁽¹⁾		V
Reverse leakage current	I_R	$V_r = 1400$ V				25			5		μA

Thermal

Thermal resistance junction to sink ⁽²⁾	$R_{th(j-s)}$	$\lambda_{paste} = 5,2$ W/mK (PTM)						0,64			K/W
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Characteristic Values

Parameter	Symbol	Conditions						Values			Unit
			V_{GE} [V] V_{GS} [V]	V_{CE} [V] V_{DS} [V] V_F [V]	I_C [A] I_D [A] I_F [A]	T_j [°C]		Min	Typ	Max	

Aux Diode L

Static

Forward voltage	V_F				60	25 125 150		1,4 1,7 1,82	1,5 ⁽¹⁾	V
Reverse leakage current	I_R	$V_i = 1400$ V				25		9	240	µA

Thermal

Thermal resistance junction to sink ⁽²⁾	$R_{th(j-s)}$	$\lambda_{paste} = 5,2$ W/mK (PTM)						0,57		K/W
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Resistor (Gate)

Static

Resistance	R							0,667		Ω
Tolerance							-1		1	%
Temperature coefficient	tc							100		ppm/K

Thermistor

Static

Rated resistance	R					25		22		kΩ
Deviation of R100	$\Delta R/R$	$R_{100} = 1484$ Ω				100	-5		5	%
Power dissipation	P					25		130		mW
Power dissipation constant	d					25		1,5		mW/K
B-value	$B_{(25/50)}$	Tol. ±1 %						3962		K
B-value	$B_{(25/100)}$	Tol. ±1 %						4000		K
Vincotech Thermistor Reference									I	

⁽¹⁾ Value at chip level

⁽²⁾ Only valid with pre-applied Vincotech thermal interface material.



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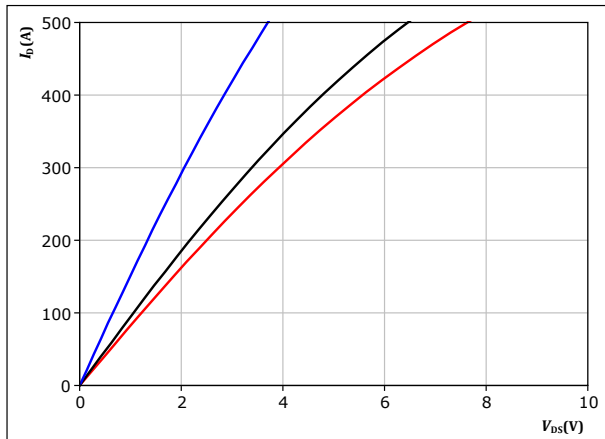
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target datasheet

Inner Boost Switch Characteristics

figure 1. MOSFET

Typical output characteristics

$$I_D = f(V_{DS})$$



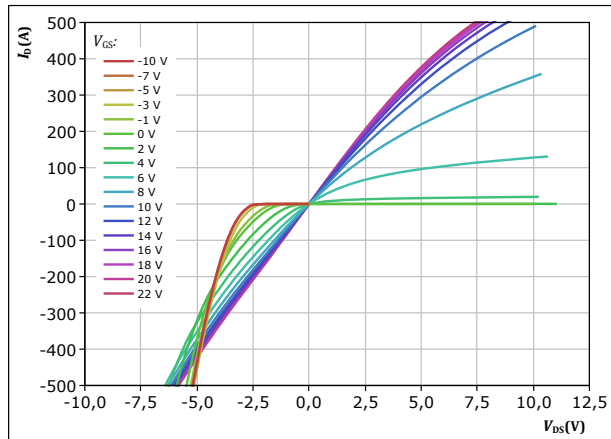
$t_p = 250 \mu s$
 $V_{GS} = 18 V$

T_j :
— 25 °C
— 125 °C
— 150 °C

figure 2. MOSFET

Typical output characteristics

$$I_D = f(V_{DS})$$

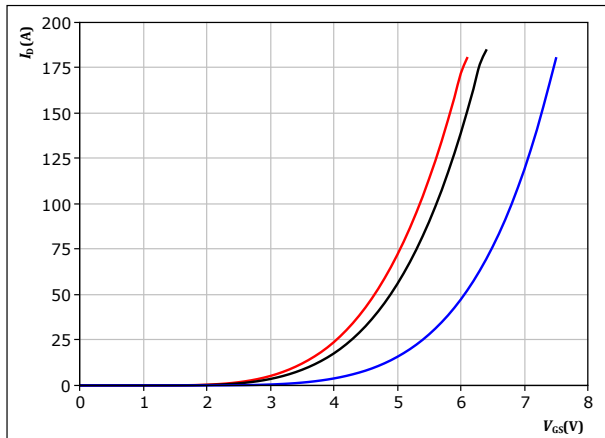


$t_p = 250 \mu s$
 $T_j = 150 ^\circ C$
 V_{GS} from -10 V to 22 V in steps of 2 V

figure 3. MOSFET

Typical transfer characteristics

$$I_D = f(V_{GS})$$



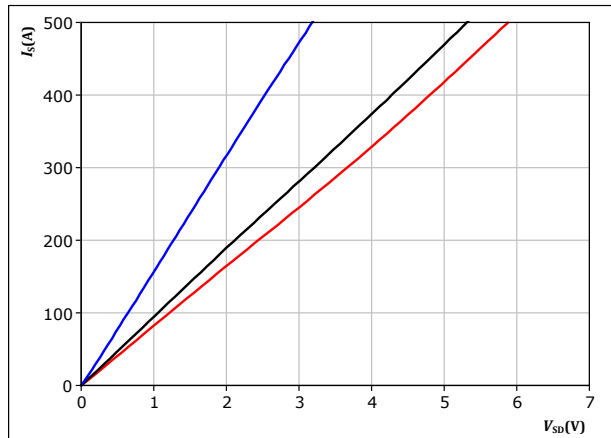
$t_p = 250 \mu s$
 $V_{DS} = 24 V$

T_j :
— 25 °C
— 125 °C
— 150 °C

figure 4. MOSFET

Typical reverse drain current characteristics

$$I_{SD} = f(V_{SD})$$



$t_p = 250 \mu s$
 $V_{GS} = 18 V$

T_j :
— 25 °C
— 125 °C
— 150 °C



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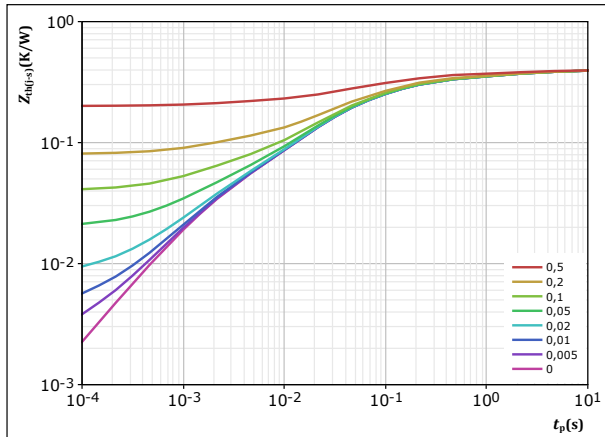
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target datasheet

Inner Boost Switch Characteristics

figure 5. MOSFET

Transient thermal impedance as a function of pulse width

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



$$D = t_p / T$$

$$R_{th(j-s)} = 0,395 \text{ K/W}$$

MOSFET thermal model values

R (K/W)	τ (s)
2,87E-02	7,60E+00
5,76E-02	1,10E+00
1,57E-01	1,16E-01
1,30E-01	2,33E-02
2,75E-02	1,72E-03



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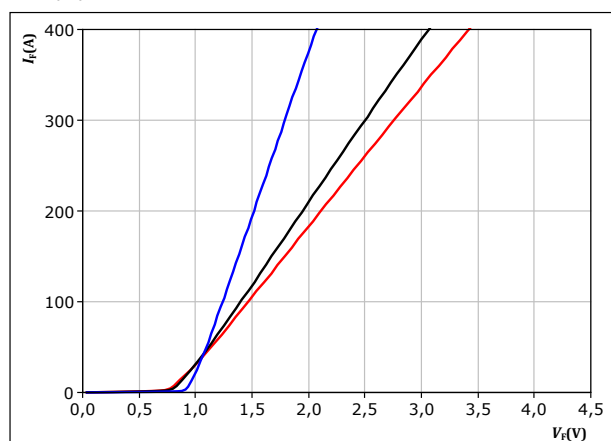
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target datasheet

Inner Boost Diode Characteristics

figure 6. FWD

Typical forward characteristics

$$I_F = f(V_F)$$



$t_p = 250 \mu s$

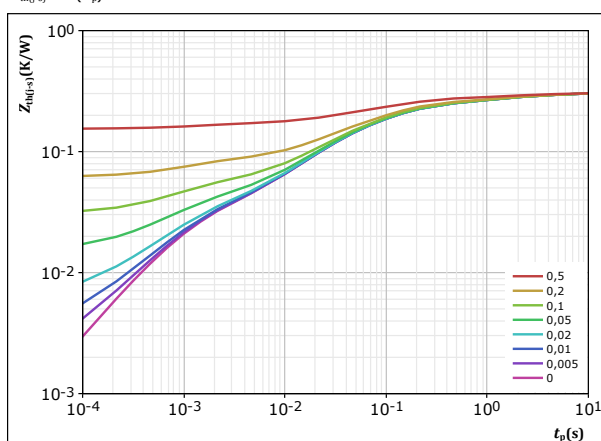
T_j :

- 25 °C
- 125 °C
- 150 °C

figure 7. FWD

Transient thermal impedance as a function of pulse width

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



$D = t_p / T$

$R_{th(j-s)} = 0,303 \text{ K/W}$

FWD thermal model values

R (K/W)	τ (s)
2,78E-02	6,25E+00
4,81E-02	9,88E-01
1,29E-01	1,05E-01
7,78E-02	2,27E-02
2,52E-02	9,62E-04



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Inner Boost Sw. Protection Diode Characteristics

figure 8.

Rectifier

Typical forward characteristics

$$I_F = f(V_F)$$

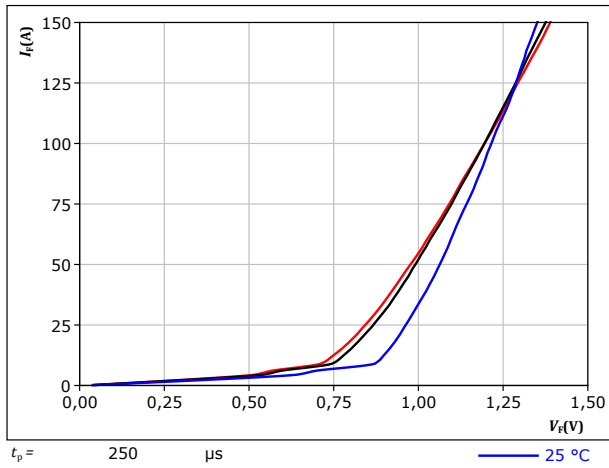
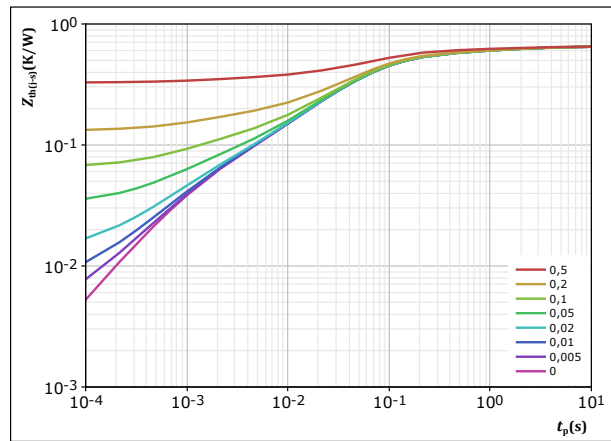


figure 9.

Rectifier

Transient thermal impedance as a function of pulse width

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



Rectifier thermal model values

$R \text{ (K/W)}$	$\tau \text{ (s)}$
1,73E-02	1,08E+01
6,50E-02	1,55E+00
1,07E-01	2,30E-01
3,45E-01	5,48E-02
7,56E-02	1,22E-02
4,07E-02	1,35E-03
4,61E-03	3,90E-04



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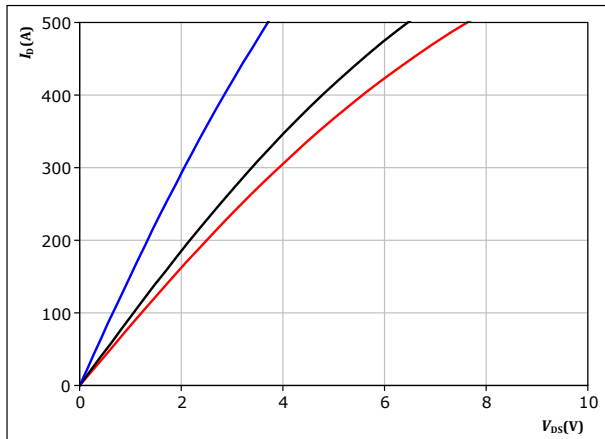
30-EX14B2A007WS01-PS29F28Z
target datasheet

Outer Boost Switch Characteristics

figure 10. MOSFET

Typical output characteristics

$$I_D = f(V_{DS})$$



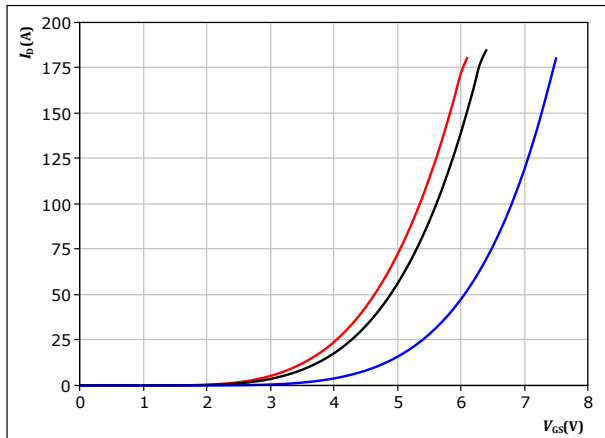
$t_p = 250 \mu s$
 $V_{GS} = 18 V$

T_j :
— 25 °C
— 125 °C
— 150 °C

figure 12. MOSFET

Typical transfer characteristics

$$I_D = f(V_{GS})$$



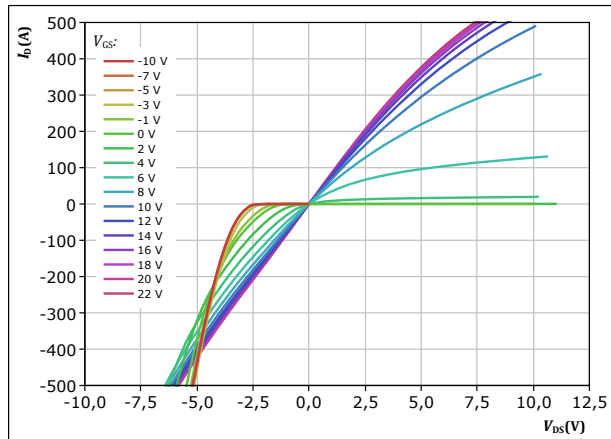
$t_p = 250 \mu s$
 $V_{DS} = 24 V$

T_j :
— 25 °C
— 125 °C
— 150 °C

figure 11. MOSFET

Typical output characteristics

$$I_D = f(V_{DS})$$

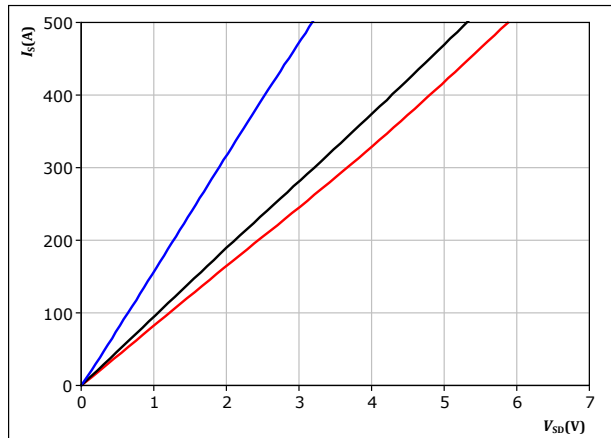


$t_p = 250 \mu s$
 $T_j = 150 \text{ } ^\circ\text{C}$
 V_{GS} from -10 V to 22 V in steps of 2 V

figure 13. MOSFET

Typical reverse drain current characteristics

$$I_{SD} = f(V_{SD})$$



$t_p = 250 \mu s$
 $V_{GS} = 18 V$

T_j :
— 25 °C
— 125 °C
— 150 °C



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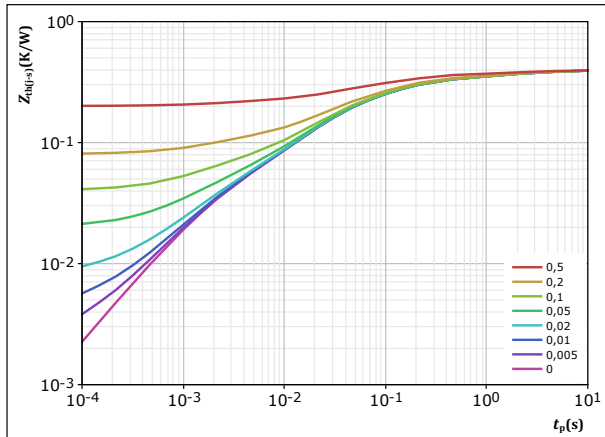
30-EX14B2A007WS01-PS29F28Z
target datasheet

Outer Boost Switch Characteristics

figure 14. MOSFET

Transient thermal impedance as a function of pulse width

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



$$D = t_p / T$$

$$R_{th(j-s)} = 0,395 \text{ K/W}$$

MOSFET thermal model values

R (K/W)	τ (s)
2,87E-02	7,60E+00
5,76E-02	1,10E+00
1,57E-01	1,16E-01
1,30E-01	2,33E-02
2,75E-02	1,72E-03



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Outer Boost Diode Characteristics

figure 15.

FWD

Typical forward characteristics

$$I_F = f(V_F)$$

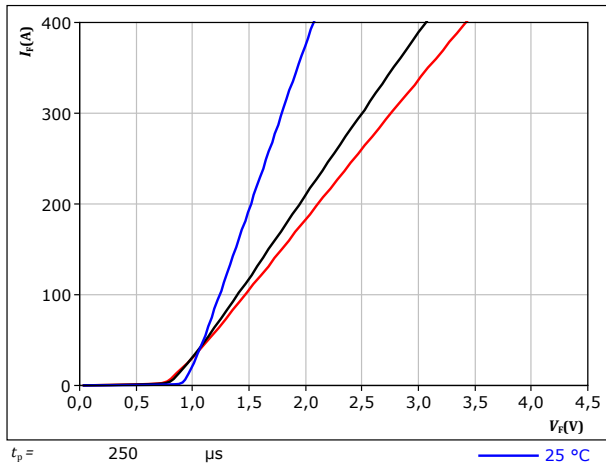
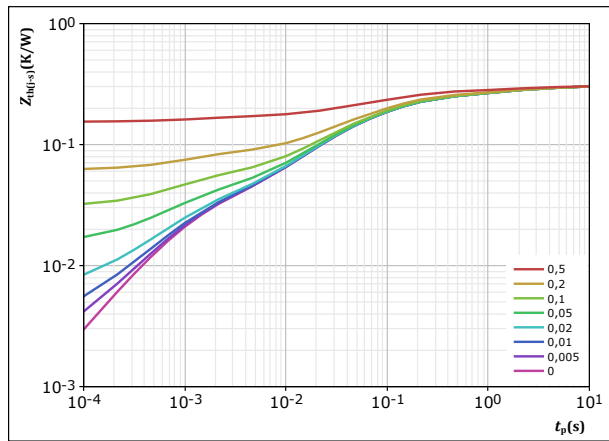


figure 16.

FWD

Transient thermal impedance as a function of pulse width

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



$D =$	t_p / T
$R_{th(j-s)} =$	0,303 K/W
FWD thermal model values	
R (K/W)	τ (s)
2,78E-02	6,25E+00
4,81E-02	9,88E-01
1,29E-01	1,05E-01
7,78E-02	2,27E-02
2,52E-02	9,62E-04



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Outer Boost Sw. Protection Diode Characteristics

figure 17. Rectifier

Typical forward characteristics

$$I_F = f(V_F)$$

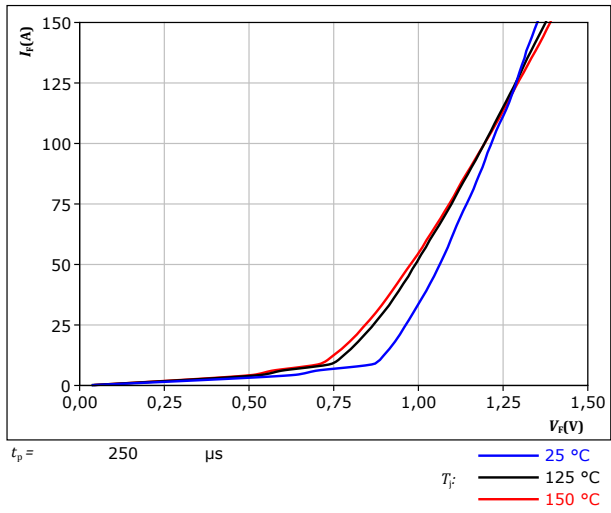
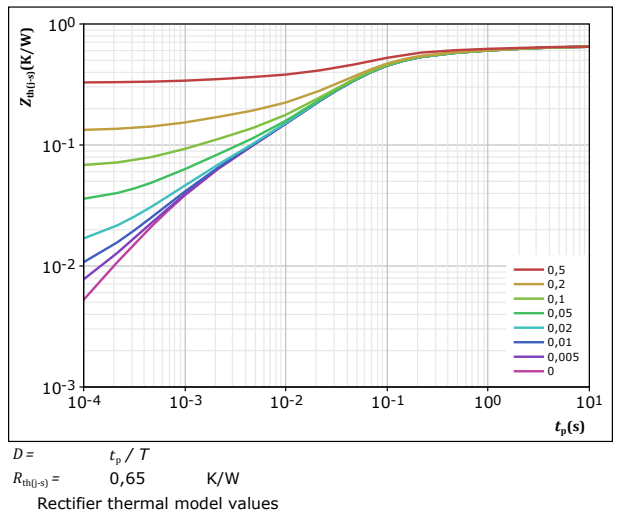


figure 18. Rectifier

Transient thermal impedance as a function of pulse width

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





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Aux Diode H Characteristics

figure 19. FWD

Typical forward characteristics
 $I_F = f(V_F)$

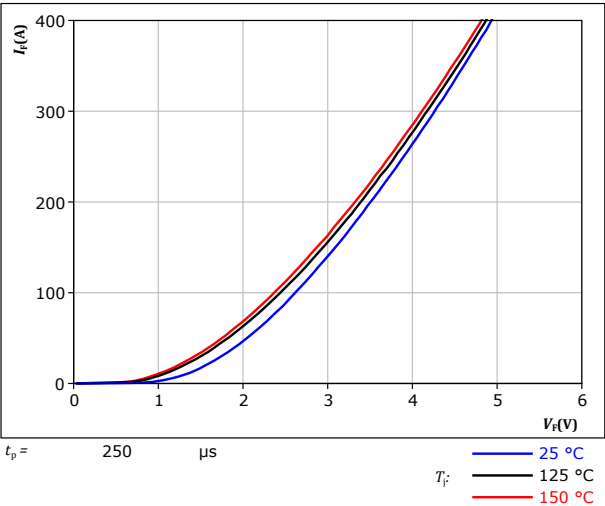
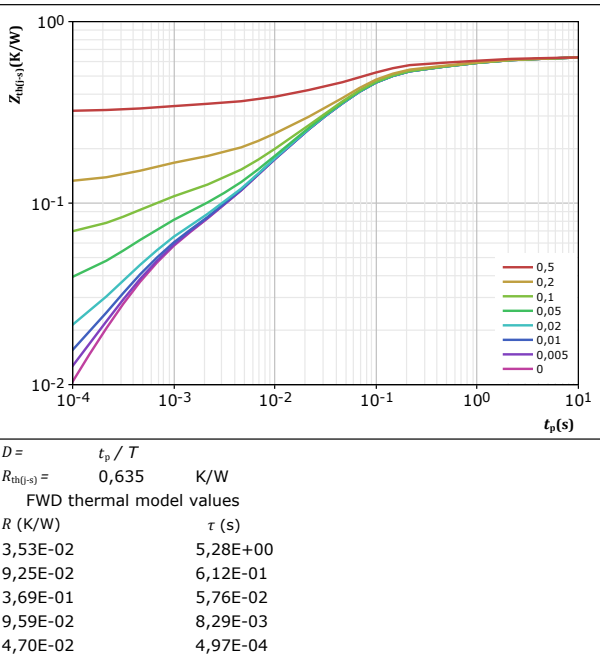


figure 20. FWD

Transient thermal impedance as a function of pulse width
 $Z_{th(j-s)} = f(t_p)$





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target datasheet

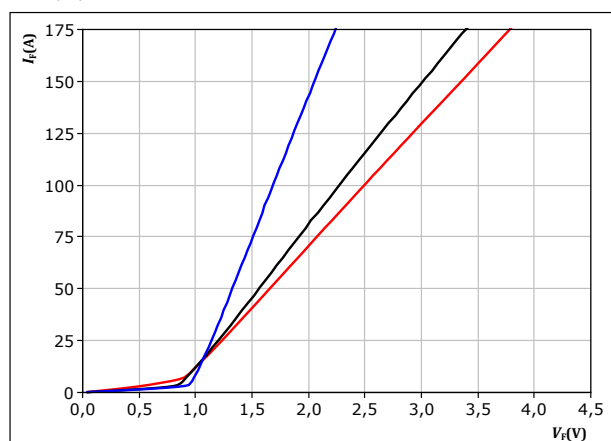
Aux Diode L Characteristics

figure 21.

FWD

Typical forward characteristics

$$I_F = f(V_F)$$



$t_p =$ 250 μ s

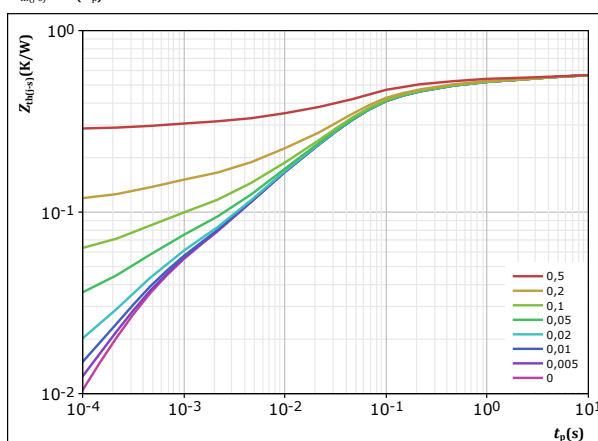
T_j :
— 25 °C
— 125 °C
— 150 °C

figure 22.

FWD

Transient thermal impedance as a function of pulse width

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



$D =$ t_p / T
 $R_{th(j-s)} =$ 0,569 K/W
FWD thermal model values

R (K/W)	τ (s)
6,36E-02	3,57E+00
1,11E-01	2,60E-01
2,86E-01	4,20E-02
7,37E-02	5,24E-03
3,85E-02	4,10E-04



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target datasheet

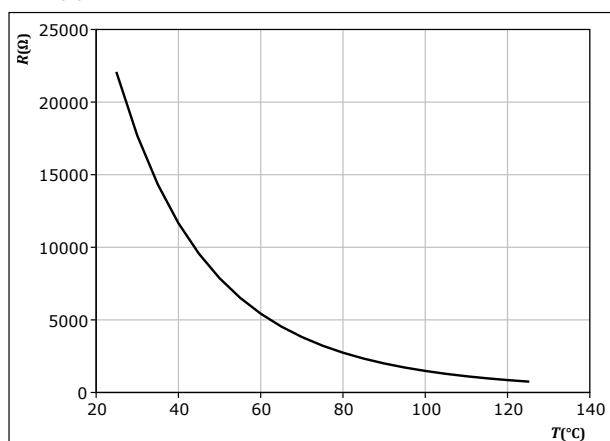
Thermistor Characteristics

figure 23.

Thermistor

Typical NTC characteristic as function of temperature

$$R_T = f(T)$$





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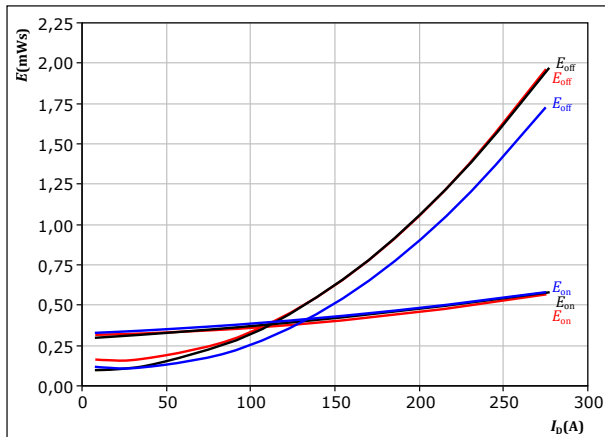
30-EX14B2A007WS01-PS29F28Z
target datasheet

Inner Boost Switching Characteristics

figure 24. MOSFET

Typical switching energy losses as a function of drain current

$$E = f(I_D)$$



With an inductive load at

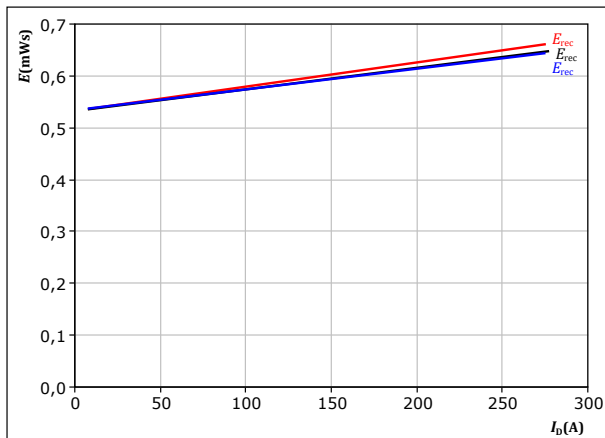
$V_{DS} = 800 \text{ V}$
 $V_{GS} = -5/18 \text{ V}$
 $R_{gon} = 1 \text{ } \Omega$
 $R_{goff} = 1 \text{ } \Omega$

T_j :
— 25 °C
— 125 °C
— 150 °C

figure 26. FWD

Typical reverse recovered energy loss as a function of drain current

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



With an inductive load at

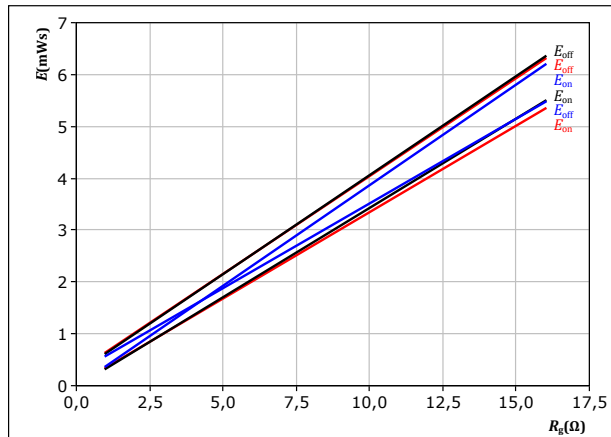
$V_{DS} = 800 \text{ V}$
 $V_{GS} = -5/18 \text{ V}$
 $R_{gon} = 1 \text{ } \Omega$

T_j :
— 25 °C
— 125 °C
— 150 °C

figure 25. MOSFET

Typical switching energy losses as a function of MOSFET turn on gate resistor

$$E = f(R_g)$$



With an inductive load at

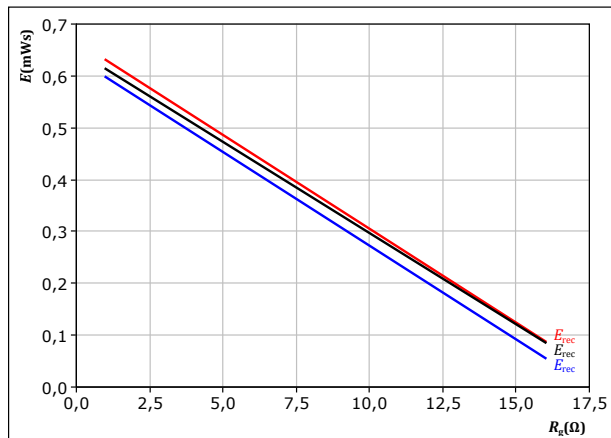
$V_{DS} = 800 \text{ V}$
 $V_{GS} = -5/18 \text{ V}$
 $I_D = 150 \text{ A}$

T_j :
— 25 °C
— 125 °C
— 150 °C

figure 27. FWD

Typical reverse recovered energy loss as a function of MOSFET turn on gate resistor

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



With an inductive load at

$V_{DS} = 800 \text{ V}$
 $V_{GS} = -5/18 \text{ V}$
 $I_D = 150 \text{ A}$

T_j :
— 25 °C
— 125 °C
— 150 °C



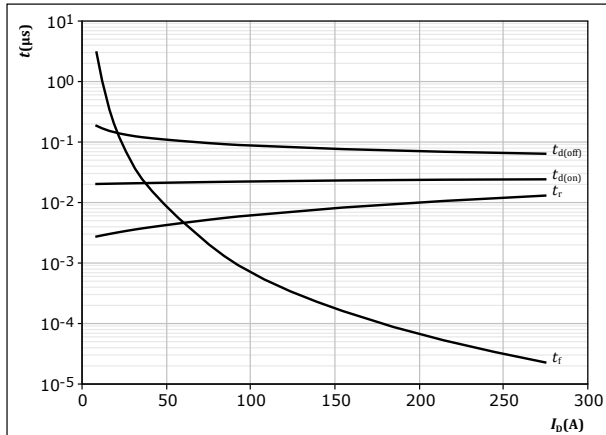
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target datasheet

Inner Boost Switching Characteristics

figure 28. MOSFET

Typical switching times as a function of drain current
 $t = f(I_D)$

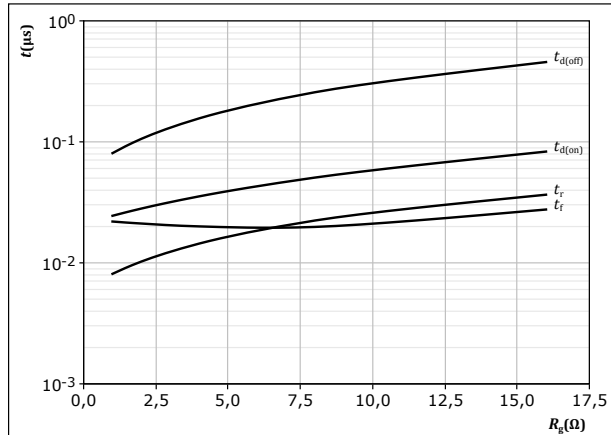


With an inductive load at

$T_j = 150$ °C
 $V_{DS} = 800$ V
 $V_{GS} = -5/18$ V
 $R_{gon} = 1$ Ω
 $R_{goff} = 1$ Ω

figure 29. MOSFET

Typical switching times as a function of MOSFET turn on gate resistor
 $t = f(R_g)$

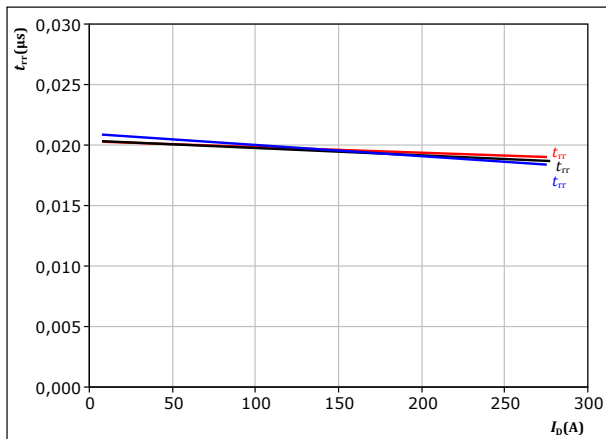


With an inductive load at

$T_j = 150$ °C
 $V_{DS} = 800$ V
 $V_{GS} = -5/18$ V
 $I_D = 150$ A

figure 30. FWD

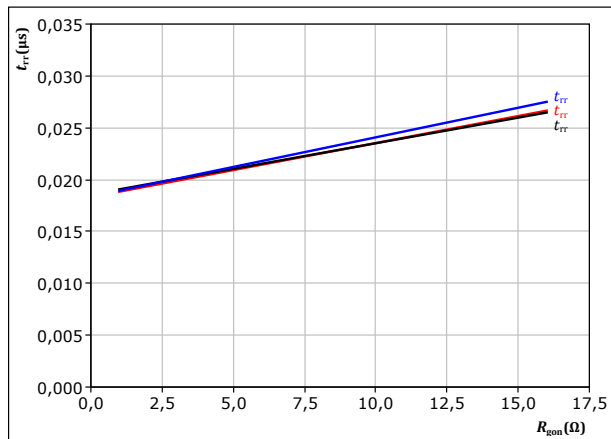
Typical reverse recovery time as a function of drain current
 $t_{rr} = f(I_D)$



At $V_{DS} = 800$ V
 $V_{GS} = -5/18$ V
 $R_{gon} = 1$ Ω
 T_j : 25 °C (blue), 125 °C (black), 150 °C (red)

figure 31. FWD

Typical reverse recovery time as a function of MOSFET turn on gate resistor
 $t_{rr} = f(R_{gon})$



At $V_{DS} = 800$ V
 $V_{GS} = -5/18$ V
 $I_D = 150$ A
 T_j : 25 °C (blue), 125 °C (black), 150 °C (red)



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target datasheet

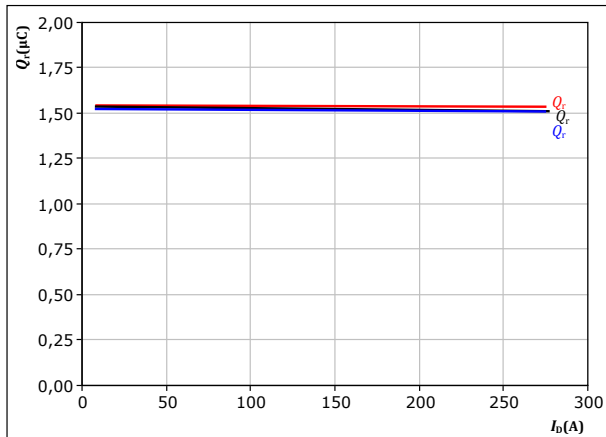
Inner Boost Switching Characteristics

figure 32.

FWD

Typical recovered charge as a function of drain current

$$Q_r = f(I_D)$$



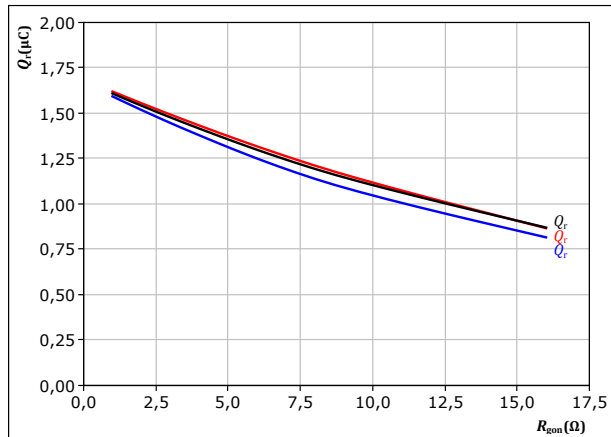
At $V_{DS} = 800$ V
 $V_{GS} = -5/18$ V
 $R_{gon} = 1$ Ω
 T_j : 25 °C
125 °C
150 °C

figure 33.

FWD

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

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



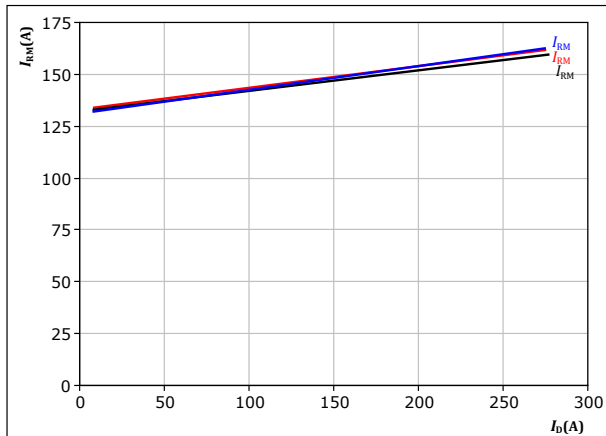
At $V_{DS} = 800$ V
 $V_{GS} = -5/18$ V
 $I_D = 150$ A
 T_j : 25 °C
125 °C
150 °C

figure 34.

FWD

Typical peak reverse recovery current as a function of drain current

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



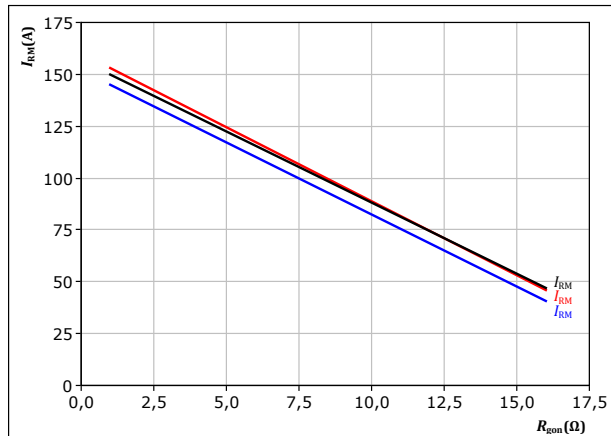
At $V_{DS} = 800$ V
 $V_{GS} = -5/18$ V
 $R_{gon} = 1$ Ω
 T_j : 25 °C
125 °C
150 °C

figure 35.

FWD

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

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



At $V_{DS} = 800$ V
 $V_{GS} = -5/18$ V
 $I_D = 150$ A
 T_j : 25 °C
125 °C
150 °C



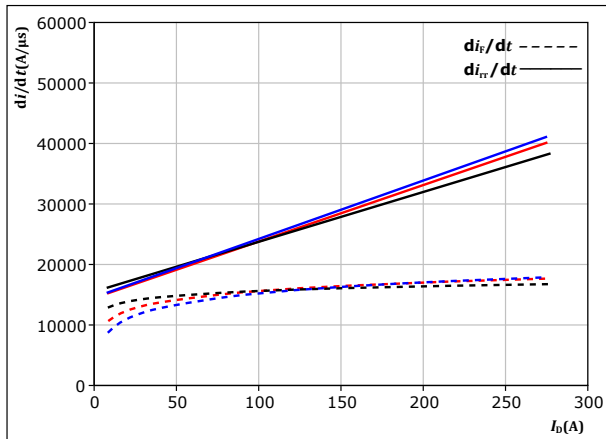
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target datasheet

Inner Boost Switching Characteristics

figure 36. FWD

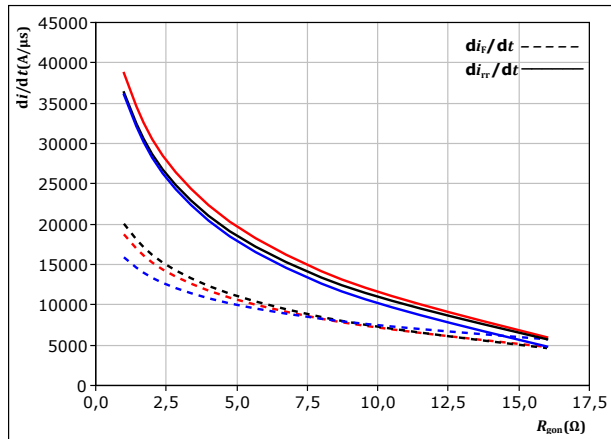
Typical rate of fall of forward and reverse recovery current as a function of drain current
 $di_f/dt, di_r/dt = f(I_D)$



At $V_{DS} = 800$ V
 $V_{GS} = -5/18$ V
 $R_{gon} = 1$ Ω
 $T_j:$ 25 °C
125 °C
150 °C

figure 37. FWD

Typical rate of fall of forward and reverse recovery current as a function of turn on gate resistor
 $di_f/dt, di_r/dt = f(R_{gon})$

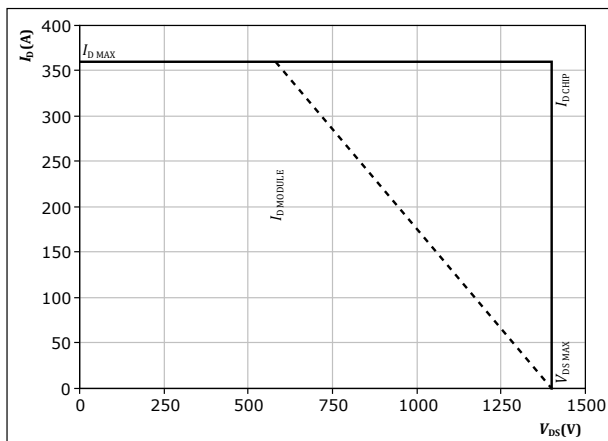


At $V_{DS} = 800$ V
 $V_{GS} = -5/18$ V
 $I_D = 150$ A
 $T_j:$ 25 °C
125 °C
150 °C

figure 38. MOSFET

Reverse bias safe operating area

$I_D = f(V_{DS})$



At $T_j = 150$ °C
 $R_{gon} = 1$ Ω
 $R_{goff} = 1$ Ω



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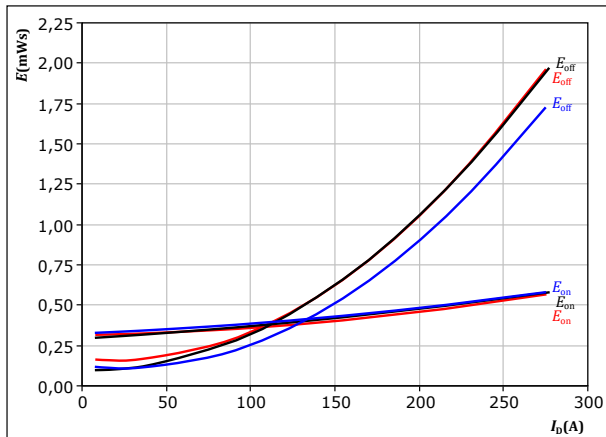
30-EX14B2A007WS01-PS29F28Z target datasheet

Outer Boost Switching Characteristics

figure 39. MOSFET

Typical switching energy losses as a function of drain current

$$E = f(I_D)$$



With an inductive load at

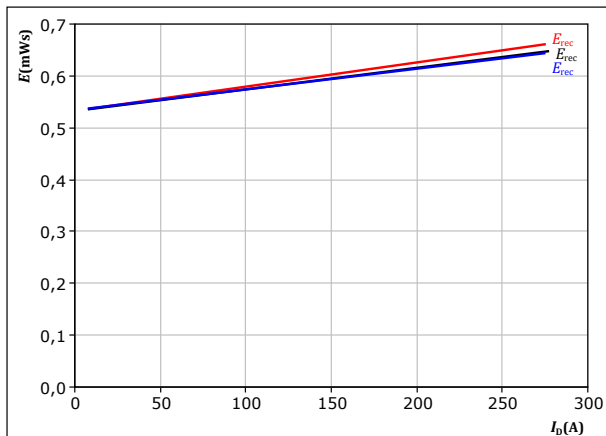
$V_{DS} = 800$ V
 $V_{GS} = -5/18$ V
 $R_{gon} = 1$ Ω
 $R_{goff} = 1$ Ω

T_j : 25 °C
125 °C
150 °C

figure 41. FWD

Typical reverse recovered energy loss as a function of drain current

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



With an inductive load at

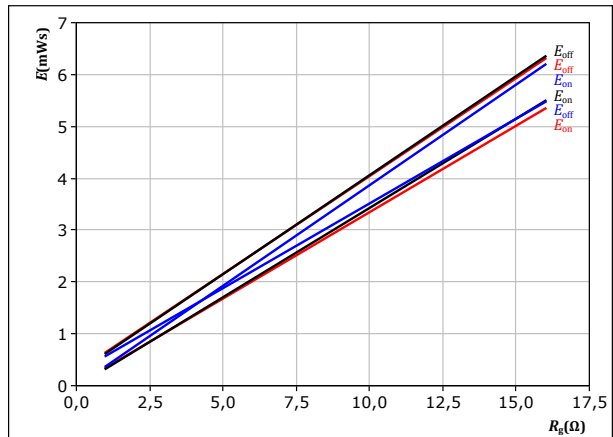
$V_{DS} = 800$ V
 $V_{GS} = -5/18$ V
 $R_{gon} = 1$ Ω

T_j : 25 °C
125 °C
150 °C

figure 40. MOSFET

Typical switching energy losses as a function of MOSFET turn on gate resistor

$$E = f(R_g)$$



With an inductive load at

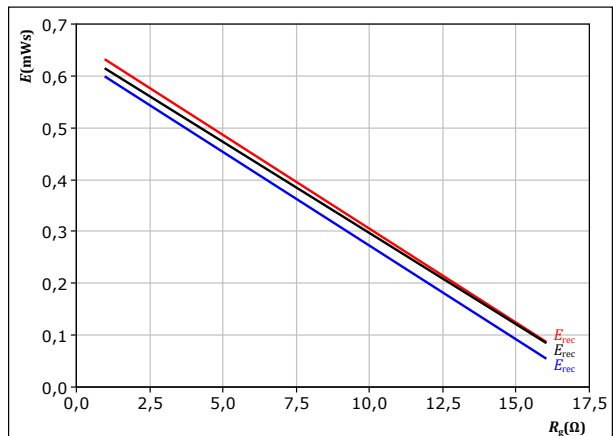
$V_{DS} = 800$ V
 $V_{GS} = -5/18$ V
 $I_D = 150$ A

T_j : 25 °C
125 °C
150 °C

figure 42. FWD

Typical reverse recovered energy loss as a function of MOSFET turn on gate resistor

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



With an inductive load at

$V_{DS} = 800$ V
 $V_{GS} = -5/18$ V
 $I_D = 150$ A

T_j : 25 °C
125 °C
150 °C



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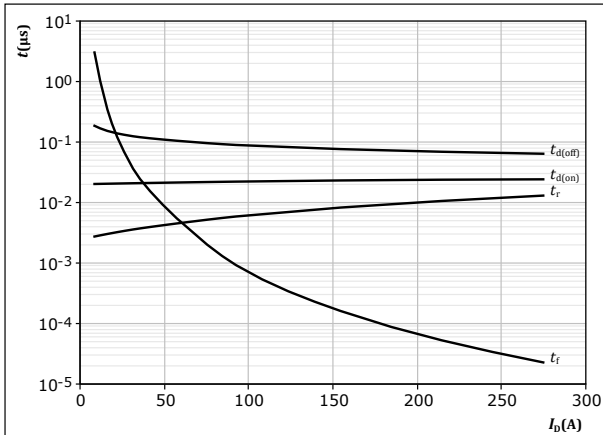
30-EX14B2A007WS01-PS29F28Z
target datasheet

Outer Boost Switching Characteristics

figure 43.

MOSFET

Typical switching times as a function of drain current
 $t = f(I_D)$



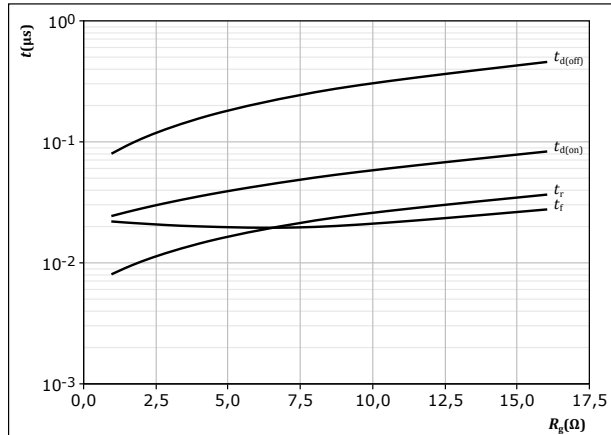
With an inductive load at

$T_j = 150$ °C
 $V_{DS} = 800$ V
 $V_{GS} = -5/18$ V
 $R_{gon} = 1$ Ω
 $R_{goff} = 1$ Ω

figure 44.

MOSFET

Typical switching times as a function of MOSFET turn on gate resistor
 $t = f(R_g)$



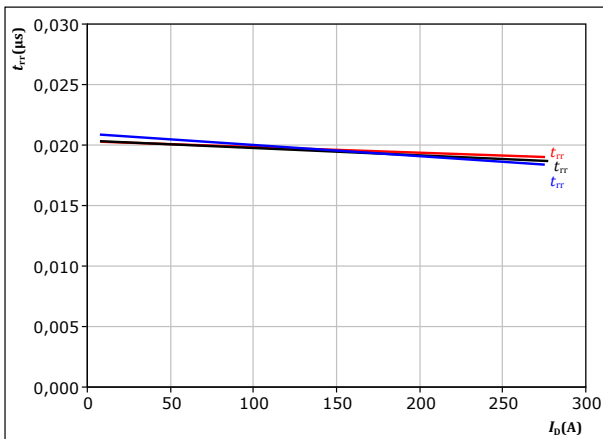
With an inductive load at

$T_j = 150$ °C
 $V_{DS} = 800$ V
 $V_{GS} = -5/18$ V
 $I_D = 150$ A

figure 45.

FWD

Typical reverse recovery time as a function of drain current
 $t_{rr} = f(I_D)$

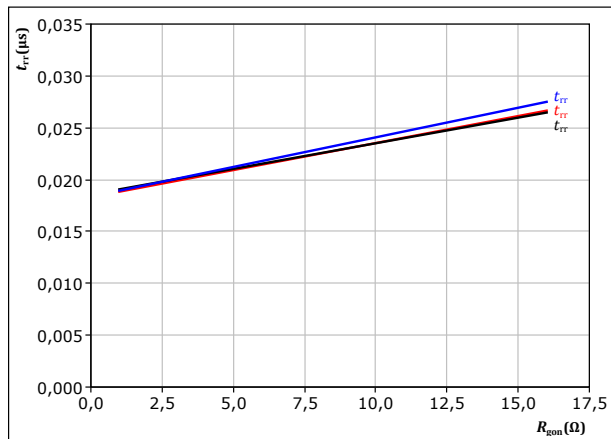


At $V_{DS} = 800$ V
 $V_{GS} = -5/18$ V
 $R_{gon} = 1$ Ω
 T_j : 25 °C (blue), 125 °C (black), 150 °C (red)

figure 46.

FWD

Typical reverse recovery time as a function of MOSFET turn on gate resistor
 $t_{rr} = f(R_{gon})$



At $V_{DS} = 800$ V
 $V_{GS} = -5/18$ V
 $I_D = 150$ A
 T_j : 25 °C (blue), 125 °C (black), 150 °C (red)



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target datasheet

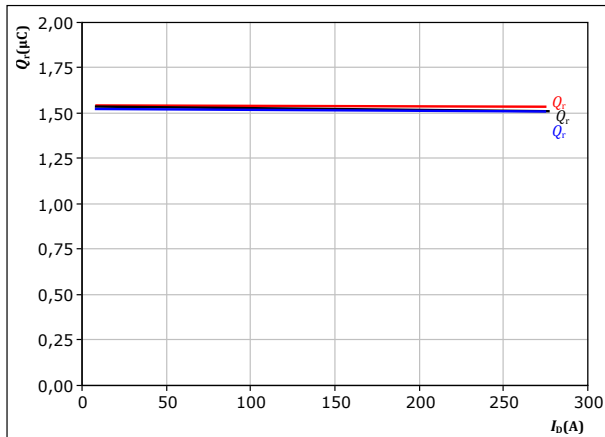
Outer Boost Switching Characteristics

figure 47.

FWD

Typical recovered charge as a function of drain current

$$Q_r = f(I_D)$$



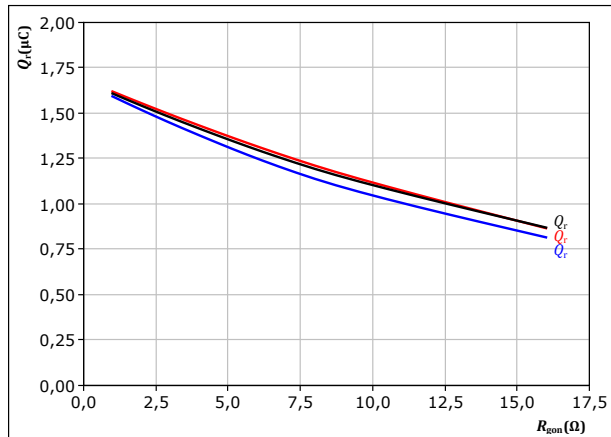
At $V_{DS} = 800$ V
 $V_{GS} = -5/18$ V
 $R_{gon} = 1$ Ω
 T_j : 25 °C
125 °C
150 °C

figure 48.

FWD

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

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



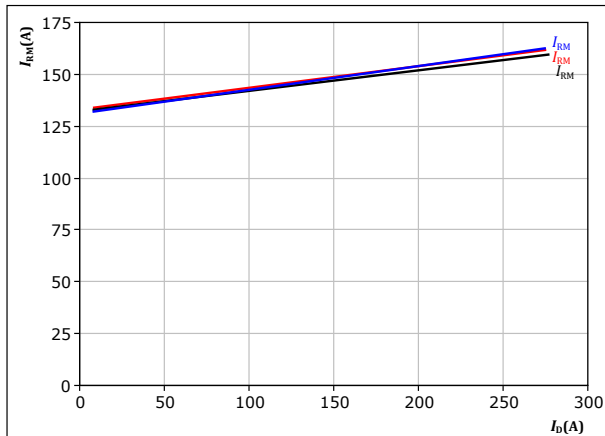
At $V_{DS} = 800$ V
 $V_{GS} = -5/18$ V
 $I_D = 150$ A
 T_j : 25 °C
125 °C
150 °C

figure 49.

FWD

Typical peak reverse recovery current as a function of drain current

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



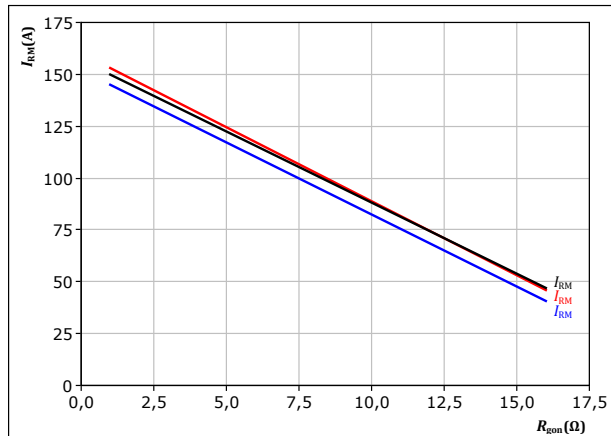
At $V_{DS} = 800$ V
 $V_{GS} = -5/18$ V
 $R_{gon} = 1$ Ω
 T_j : 25 °C
125 °C
150 °C

figure 50.

FWD

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

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



At $V_{DS} = 800$ V
 $V_{GS} = -5/18$ V
 $I_D = 150$ A
 T_j : 25 °C
125 °C
150 °C



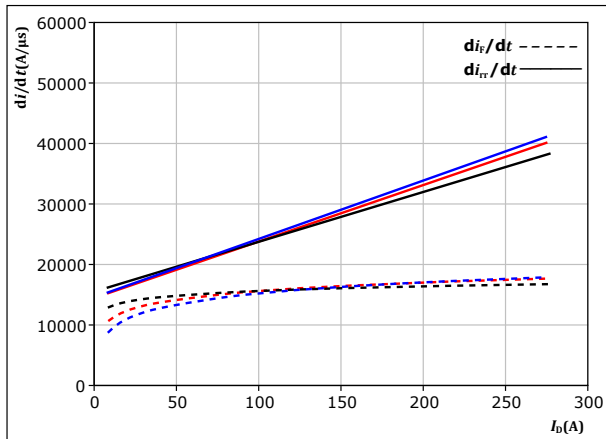
Vincotech

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target datasheet

Outer Boost Switching Characteristics

figure 51. FWD

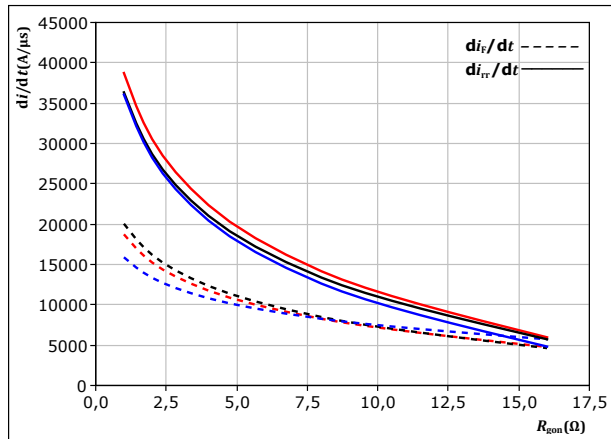
Typical rate of fall of forward and reverse recovery current as a function of drain current
 $di_f/dt, di_r/dt = f(I_D)$



At $V_{DS} = 800$ V
 $V_{GS} = -5/18$ V
 $R_{gon} = 1$ Ω
 $T_j:$ 25 °C (blue), 125 °C (black), 150 °C (red)

figure 52. FWD

Typical rate of fall of forward and reverse recovery current as a function of turn on gate resistor
 $di_f/dt, di_r/dt = f(R_{gon})$

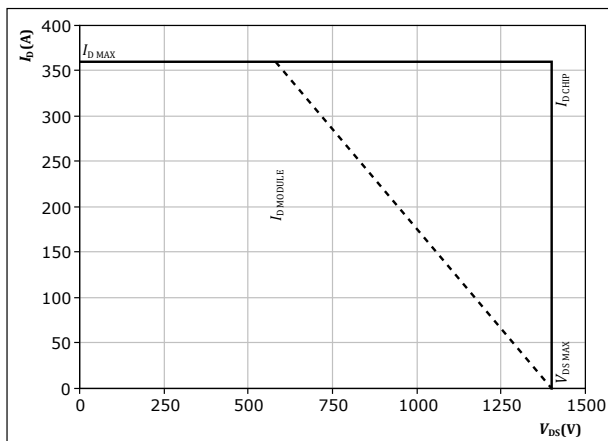


At $V_{DS} = 800$ V
 $V_{GS} = -5/18$ V
 $I_D = 150$ A
 $T_j:$ 25 °C (blue), 125 °C (black), 150 °C (red)

figure 53. MOSFET

Reverse bias safe operating area

$I_D = f(V_{DS})$



At $T_j = 150$ °C
 $R_{gon} = 1$ Ω
 $R_{goff} = 1$ Ω



Vincotech

30-EX14B2A007WS01-PS29F28Z
target datasheet

Switching Definitions

figure 54. MOSFET

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

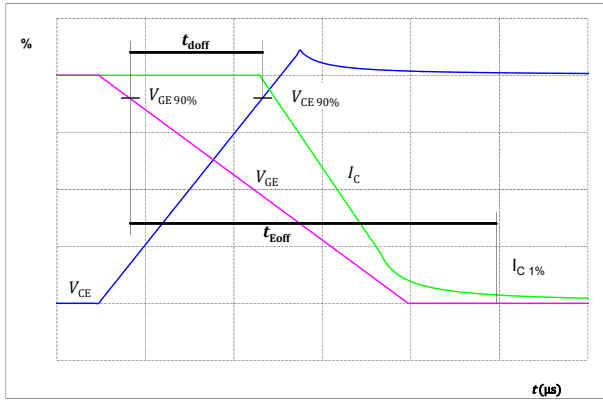


figure 55. MOSFET

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

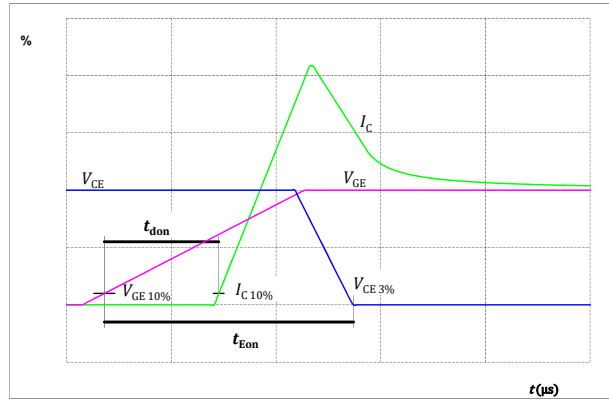


figure 56. MOSFET

Turn-off Switching Waveforms & definition of t_f

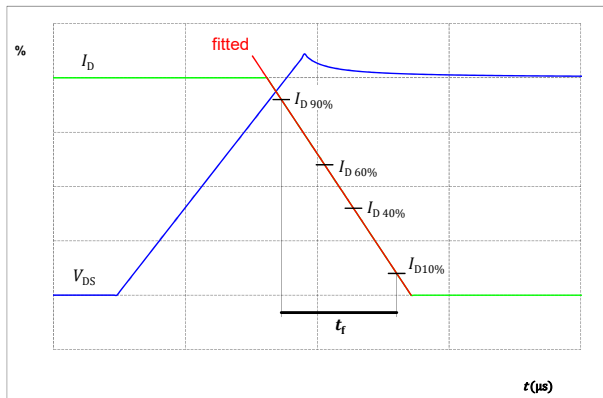
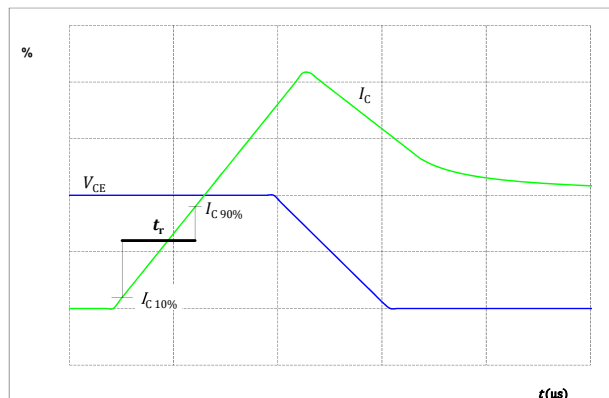


figure 57. MOSFET

Turn-on Switching Waveforms & definition of t_r





Vincotech

Switching Definitions

figure 58.

FWD

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

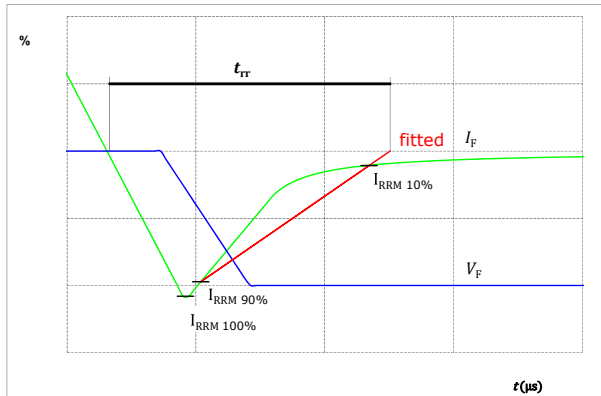


figure 59.

FWD

Turn-on Switching Waveforms & definition of t_{Qr} (t_{Qr} = integrating time for Q_r)

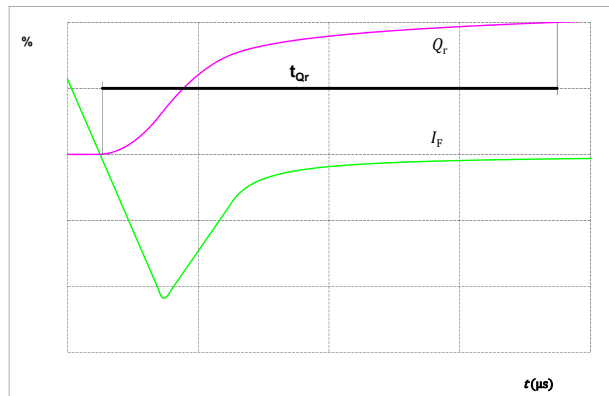
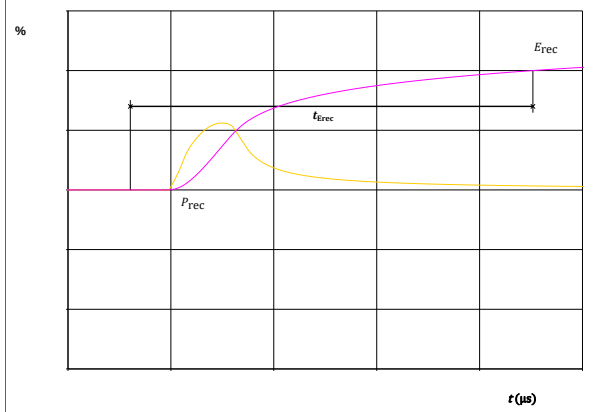


figure 60.

FWD

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





target datasheet

Marking							
	Text	Name		Date code	Logo	Lot	Serial
		NN-NNNNNNNNNNNNN- TTTTTV		WWYY	VIN	LLLLL	SSSS
	Datamatrix	Type&Ver	Lot number	Serial	Date code		
		TTTTTV	LLLLL	SSSS	WWYY		

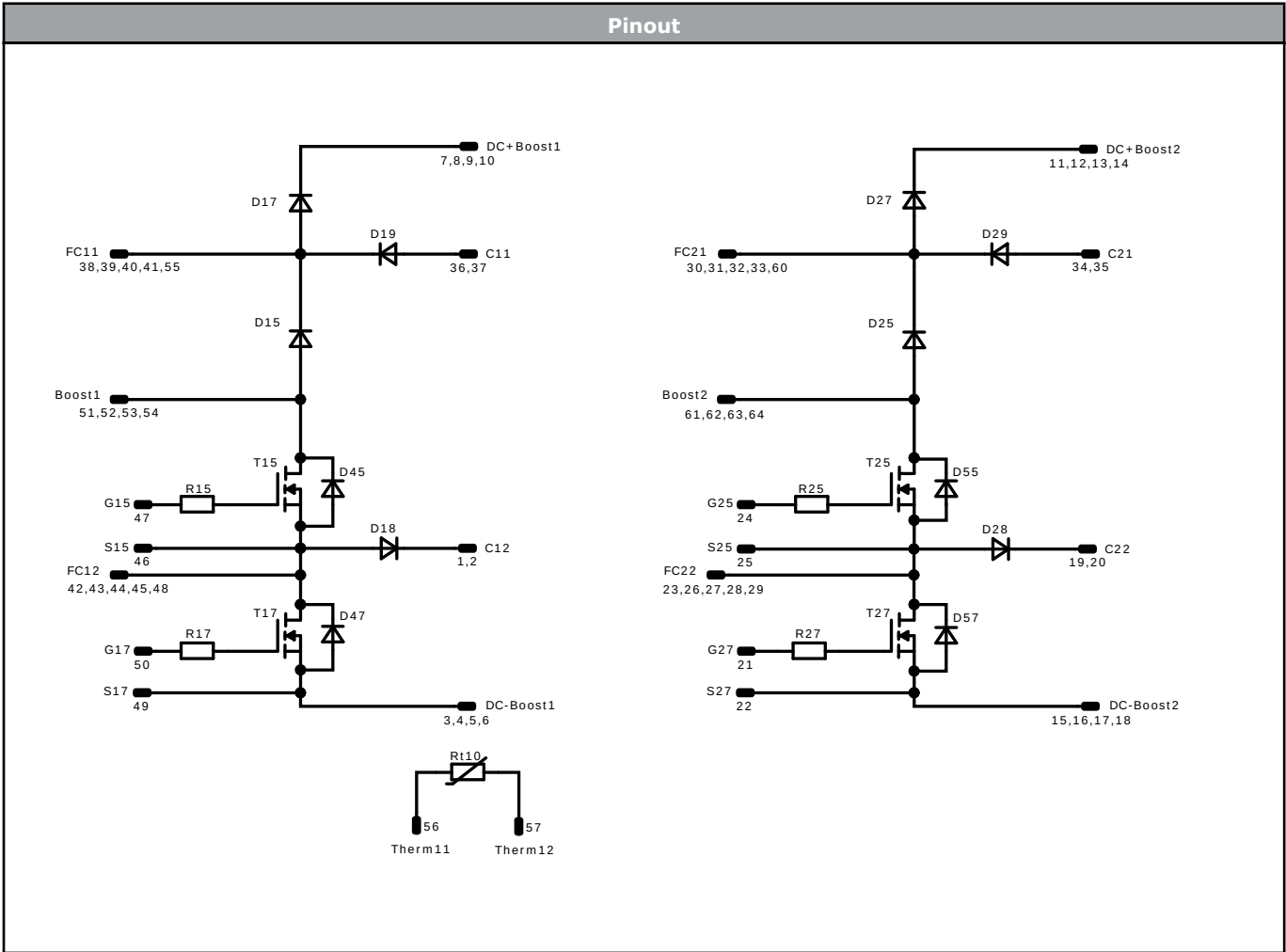
Technical drawing of the 3D printer's base plate, showing a top view and a side view.

The top view shows a rectangular plate with a central grid of 60 pins, numbered 1 to 60. The pins are arranged in a 6x10 grid. The plate has a central rectangular cutout with a small rectangular feature in the center. The side view shows the plate's profile with a height of 86.2 ± 0.5 mm. A coordinate system (X, Y) is shown at the bottom left. A note at the bottom right states: "Tolerance of pin positions: ±0.4mm at the end of pins. Dimension of connector pins is only offset without tolerance." A small box at the bottom center contains the number 3738.



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30-EX14B2A007WS01-PS29F28Z
target datasheet



Identification					
ID	Component	Voltage	Current	Function	Comment
T15, T25	MOSFET	1400 V	6,67 mΩ	Inner Boost Switch	
D15, D25	FWD	1400 V	160 A	Inner Boost Diode	
D45, D55	Rectifier	1600 V	50 A	Inner Boost Sw. Protection Diode	
T17, T27	MOSFET	1400 V	6,67 mΩ	Outer Boost Switch	
D17, D27	FWD	1400 V	160 A	Outer Boost Diode	
D47, D57	Rectifier	1600 V	50 A	Outer Boost Sw. Protection Diode	
D19, D29	FWD	1400 V	140 A	Aux Diode H	
D18, D28	FWD	1400 V	60 A	Aux Diode L	
R15, R17, R25, R27	Resistor			Resistor (Gate)	
Rt	Thermistor			Thermistor	



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target datasheet

Packaging instruction				
Standard packaging quantity (SPQ) 24	>SPQ	Standard	<SPQ	Sample
Handling instruction				
Handling instructions for <i>flow</i> E3BP packages see vincotech.com website.				
Package data				
Package data for <i>flow</i> E3BP packages see vincotech.com website.				
Vincotech thermistor reference				
See Vincotech thermistor reference table at vincotech.com website.				
Application Note				
For use of pre-charging auxiliary diodes see application note: "The Advantages and Operation of Flying-Capacitor Boosters" at vincotech.com				
UL recognition and file number				
Certification pending. For more information see vincotech.com website.				

Document No.:	Date:	Modification:	Pages
30-EX14B2A007WS01-PS29F28Z-T2-14	23 Jul. 2026	Change Boost Diodes and Aux Diode L	

Product status definition		
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.

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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.