



Vincotech

30-EQ14B2A007WS01-PS29F28T

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
- Thermo-mechanical push-and-pull force relief
- Press-fit pin
- Reliable cold welding connection

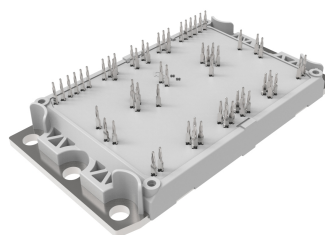
Target applications

- Solar Inverters

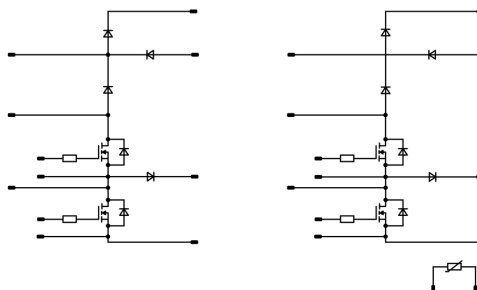
Types

- 30-EQ14B2A007WS01-PS29F28T

flow E3BP 15 mm housing



Schematic





Vincotech

30-EQ14B2A007WS01-PS29F28T
datasheet

Maximum Ratings

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

Parameter	Symbol	Conditions	Value	Unit
Inner Boost Switch				
Drain-source voltage	V_{DS}		1400	V
Drain current (DC current)	I_D	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	161	A
Peak drain current	I_{DM}	t_p limited by T_{jmax}	477	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	288	W
Gate-source voltage	V_{GS}	static	-4 / 18	V
		dynamic	-12 / 24	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	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	149	A
Repetitive peak forward current	I_{FRM}	t_p limited by T_{jmax}	320	A
Surge (non-repetitive) forward current	I_{FSM}	Single Half Sine Wave, $t_p = 10\text{ ms}$ $T_j = 25\text{ °C}$	1280	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	328	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	A²s
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	146	W
Maximum junction temperature	T_{jmax}		175	°C



Vincotech

30-EQ14B2A007WS01-PS29F28T
datasheet

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	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	161	A
Peak drain current	I_{DM}	t_p limited by T_{jmax}	477	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	288	W
Gate-source voltage	V_{GS}	static	-4 / 18	V
		dynamic	-12 / 24	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	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	149	A
Repetitive peak forward current	I_{FRM}	t_p limited by T_{jmax}	320	A
Surge (non-repetitive) forward current	I_{FSM}	Single Half Sine Wave, $t_p = 10\text{ ms}$ $T_j = 25\text{ °C}$	1280	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	328	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	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



Vincotech

30-EQ14B2A007WS01-PS29F28T
datasheet

Maximum Ratings

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

Parameter	Symbol	Conditions	Value	Unit
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	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	58	A
Repetitive peak forward current	I_{FRM}	t_p limited by T_{jmax}	120	A
Surge (non-repetitive) forward current	I_{FSM}	Single Half Sine Wave, $t_p = 10\text{ ms}$ $T_j = 25\text{ °C}$	480	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	126	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

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			> 12,7	mm
Clearance			11,81	mm
Comparative Tracking Index	CTI		≥ 600	

*100 % tested in production



Vincotech

30-EQ14B2A007WS01-PS29F28T
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 Switch

Static

Drain-source on-state resistance	$r_{DS(on)}$		18		150	25 125 150		6,92 9,39 10,5	9,67 ⁽¹⁾	mΩ
Gate-source threshold voltage	$V_{GS(th)}$				0,06	25	1,9	2,6	3,5	V
Gate to Source Leakage Current	I_{GSS}		24	0		25		30	300	nA
Zero Gate Voltage Drain Current	I_{DSS}		0	1400		25		0,6	300	μA
Internal gate resistance	r_g							0,2		Ω
Gate charge	Q_g		-4/18	800	150	25		645		nC
Short-circuit input capacitance	C_{iss}	$f = 1 \text{ Mhz}$	0	1000	0	25		14103		pF
Short-circuit output capacitance	C_{oss}							597		
Reverse transfer capacitance	C_{rss}							60		
Diode forward voltage	V_{SD}		0		75	25		2,9		V

Thermal

Thermal resistance junction to sink ⁽²⁾	$R_{th(j-s)}$	$\lambda_{paste} = 5,2 \text{ W/mK}$ (PTM)						0,33		K/W
--	---------------	---	--	--	--	--	--	------	--	-----

Dynamic

Turn-on delay time	$t_{d(on)}$	$R_{gon} = 2 \text{ Ω}$ $R_{goff} = 2 \text{ Ω}$	-4/18	800	150	25 125 150		38,91 35,56 35,23		ns
Rise time	t_r					25 125 150		20,3 17,71 16,43		ns
Turn-off delay time	$t_{d(off)}$					25 125 150		95,59 104,74 107,19		ns
Fall time	t_f					25 125 150		14,31 15,9 16,51		ns
Turn-on energy (per pulse)	E_{on}					25 125 150		3,14 2,44 2,32		mWs
Turn-off energy (per pulse)	E_{off}					25 125 150		1,94 1,9 1,95		mWs



Vincotech

30-EQ14B2A007WS01-PS29F28T
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 Diode

Static

Forward voltage	V_F				160	25 125 150		1,62 2,03 2,19	1,7 ⁽¹⁾ 2,2 ⁽¹⁾	V
Reverse leakage current	I_R	$V_i = 1400$ V				25		8	800	µA

Thermal

Thermal resistance junction to sink ⁽²⁾	$R_{th(j-s)}$	$\lambda_{paste} = 5,2$ W/mK (PTM)						0,29		K/W
--	---------------	---------------------------------------	--	--	--	--	--	------	--	-----

Dynamic

Peak recovery current	I_{RM}	$di/dt=11288$ A/µs $di/dt=9739$ A/µs $di/dt=14354$ A/µs	-4/18	800	150	25 125 150		58,48 69,54 70,78		A
Reverse recovery time	t_{rr}					25 125 150		17,22 16,65 16,68		ns
Recovered charge	Q_r					25 125 150		0,613 0,713 0,724		µC
Reverse recovered energy	E_{rec}					25 125 150		0,229 0,324 0,338		mWs
Peak rate of fall of recovery current	$(di_{rr}/dt)_{max}$					25 125 150		9204,68 11179,29 11888,26		A/µs



Vincotech

30-EQ14B2A007WS01-PS29F28T
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
--	---------------	---------------------------------------	--	--	--	--	--	------	--	-----



Vincotech

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		150	25 125 150		6,92 9,39 10,5	9,67 ⁽¹⁾	mΩ
Gate-source threshold voltage	$V_{GS(th)}$				0,06	25	1,9	2,6	3,5	V
Gate to Source Leakage Current	I_{GSS}		24	0		25		30	300	nA
Zero Gate Voltage Drain Current	I_{DSS}		0	1400		25		0,6	300	μA
Internal gate resistance	r_g							0,2		Ω
Gate charge	Q_g		-4/18	800	150	25		645		nC
Short-circuit input capacitance	C_{iss}	$f = 1 \text{ Mhz}$	0	1000	0	25		14103		pF
Short-circuit output capacitance	C_{oss}							597		
Reverse transfer capacitance	C_{rss}							60		
Diode forward voltage	V_{SD}		0		75	25		2,9		V

Thermal

Thermal resistance junction to sink ⁽²⁾	$R_{th(j-s)}$	$\lambda_{\text{paste}} = 5,2 \text{ W/mK}$ (PTM)						0,33		K/W
--	---------------	--	--	--	--	--	--	------	--	-----

Dynamic

Turn-on delay time	$t_{d(on)}$	$R_{gon} = 4 \text{ Ω}$ $R_{goff} = 4 \text{ Ω}$	-4/18	800	150	25 125 150		60,84 53,95 53,13		ns
Rise time	t_r					25 125 150		31,51 25,44 25,09		ns
Turn-off delay time	$t_{d(off)}$					25 125 150		163,14 180,79 186,14		ns
Fall time	t_f					25 125 150		15,2 17,05 16,66		ns
Turn-on energy (per pulse)	E_{on}					25 125 150		3,96 3,02 2,89		mWs
Turn-off energy (per pulse)	E_{off}					25 125 150		3,03 3,14 3,18		mWs



Vincotech

30-EQ14B2A007WS01-PS29F28T

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	

Outer Boost Diode

Static

Forward voltage	V_F				160	25 125 150		1,62 2,03 2,19	1,7 ⁽¹⁾ 2,2 ⁽¹⁾	V
Reverse leakage current	I_R	$V_i = 1400$ V				25		8	800	µA

Thermal

Thermal resistance junction to sink ⁽²⁾	$R_{th(j-s)}$	$\lambda_{paste} = 5,2$ W/mK (PTM)						0,29		K/W
--	---------------	---------------------------------------	--	--	--	--	--	------	--	-----

Dynamic

Peak recovery current	I_{RM}	$di/dt=5021$ A/µs $di/dt=6522$ A/µs $di/dt=8685$ A/µs	-4/18	800	150	25 125 150		55,82 64,79 65,41		A
Reverse recovery time	t_{rr}					25 125 150		19,93 19,81 19,78		ns
Recovered charge	Q_r					25 125 150		0,618 0,703 0,71		µC
Reverse recovered energy	E_{rec}					25 125 150		0,206 0,273 0,281		mWs
Peak rate of fall of recovery current	$(di_{rr}/dt)_{max}$					25 125 150		9597,95 11642,73 10226,49		A/µs



Vincotech

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
--	---------------	------------------------------------	--	--	--	--	--	------	--	--	-----

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
--	---------------	------------------------------------	--	--	--	--	--	------	--	--	-----



Vincotech

30-EQ14B2A007WS01-PS29F28T
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	

Aux Diode L

Static

Forward voltage	V_F				60	25 125 150		1,54 1,96 2,11	1,7 ⁽¹⁾ 2,2 ⁽¹⁾	V
Reverse leakage current	I_R	$V_i = 1400$ V				25		3	300	µA

Thermal

Thermal resistance junction to sink ⁽²⁾	$R_{th(j-s)}$	$\lambda_{paste} = 5,2$ W/mK (PTM)						0,75		K/W
--	---------------	---------------------------------------	--	--	--	--	--	------	--	-----

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.

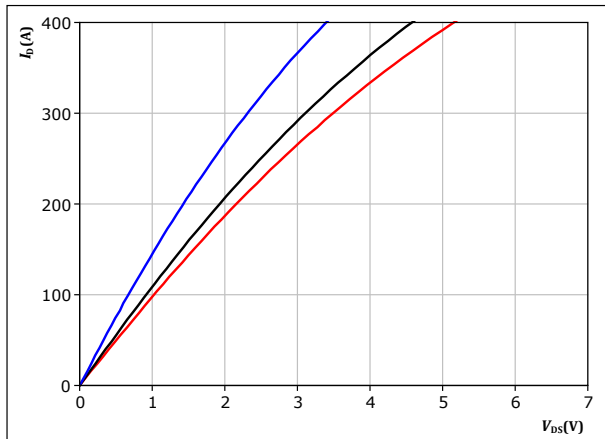


Inner Boost Switch Characteristics

figure 1. MOSFET

Typical output characteristics

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



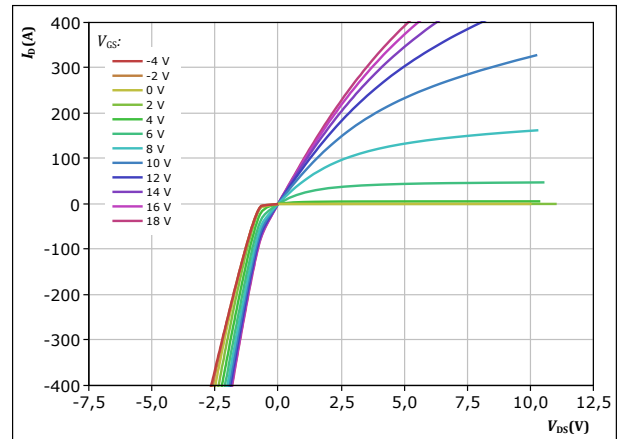
$t_p = 250 \mu s$
 $V_{GS} = 18 V$

T_j :
— 25 °C
— 125 °C
— 150 °C

figure 2. MOSFET

Typical output characteristics

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

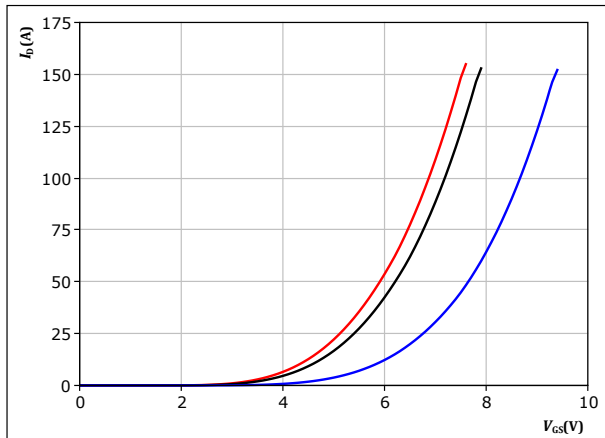


$t_p = 250 \mu s$
 $T_j = 150 ^\circ C$
 V_{GS} from -4 V to 18 V in steps of 2 V

figure 3. MOSFET

Typical transfer characteristics

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



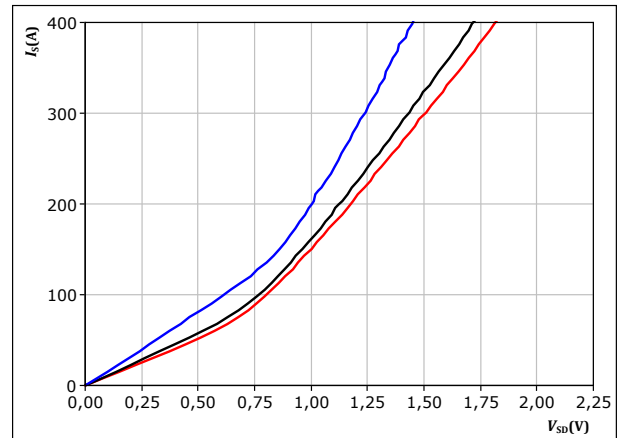
$t_p = 250 \mu s$
 $V_{DS} = 30 V$

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



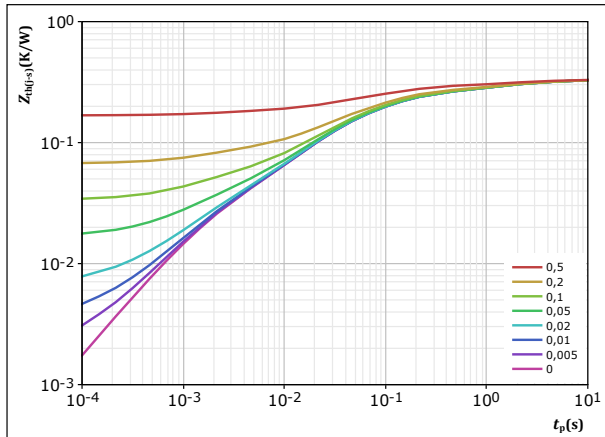
Vincotech

Inner Boost Switch Characteristics

figure 5. MOSFET

Transient thermal impedance as a function of pulse width

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



$$D = t_p / T$$

$$R_{th(j-a)} = 0,329 \text{ K/W}$$

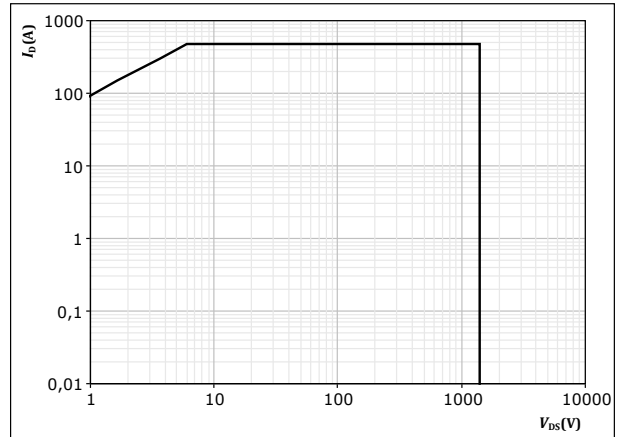
MOSFET thermal model values

R (K/W)	τ (s)
3,02E-02	7,11E+00
6,31E-02	1,07E+00
1,32E-01	1,01E-01
9,02E-02	2,26E-02
2,00E-02	1,60E-03

figure 6. MOSFET

Safe operating area

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



$D = \text{single pulse}$

$$T_a = 80 \text{ } ^\circ\text{C}$$

$$V_{GS} = 18 \text{ V}$$

$$T_j = T_{jmax}$$



Vincotech

Inner Boost Diode Characteristics

figure 7.

FWD

Typical forward characteristics

$$I_F = f(V_F)$$

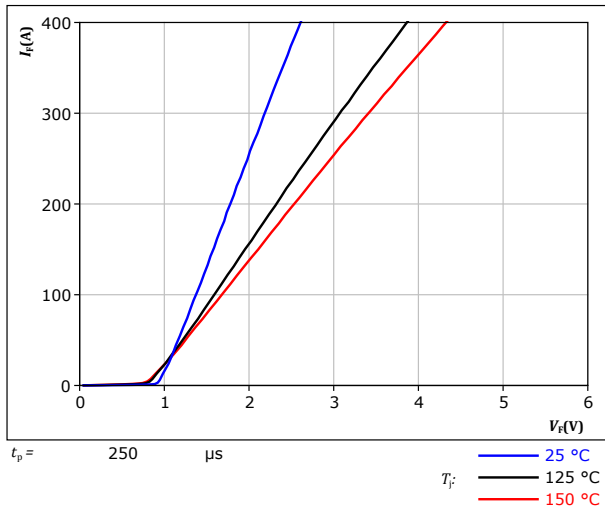
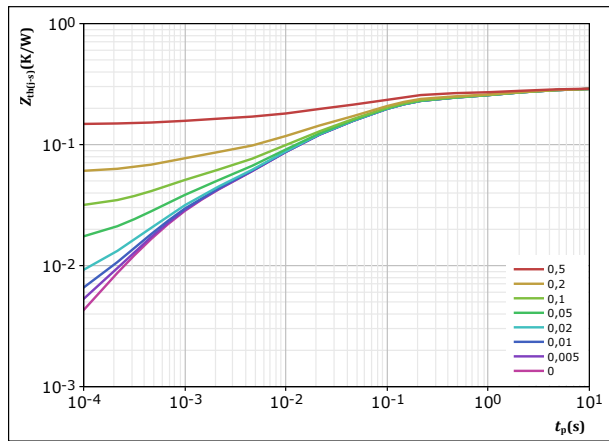


figure 8.

FWD

Transient thermal impedance as a function of pulse width

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





Vincotech

30-EQ14B2A007WS01-PS29F28T datasheet

Inner Boost Sw. Protection Diode Characteristics

figure 9. Rectifier

Typical forward characteristics

$$I_F = f(V_F)$$

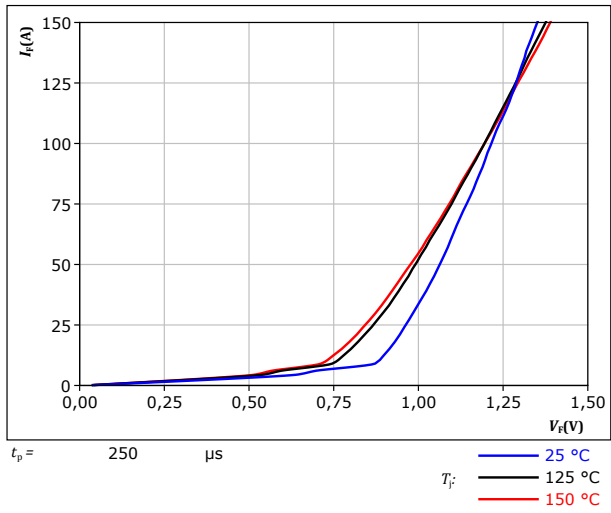
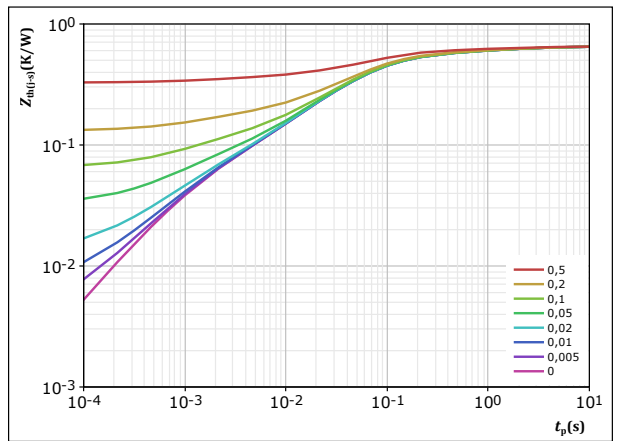


figure 10. Rectifier

Transient thermal impedance as a function of pulse width

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



$D =$	t_p / T
$R_{th(j-s)} =$	0,65 K/W
Rectifier thermal model values	
R (K/W)	τ (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

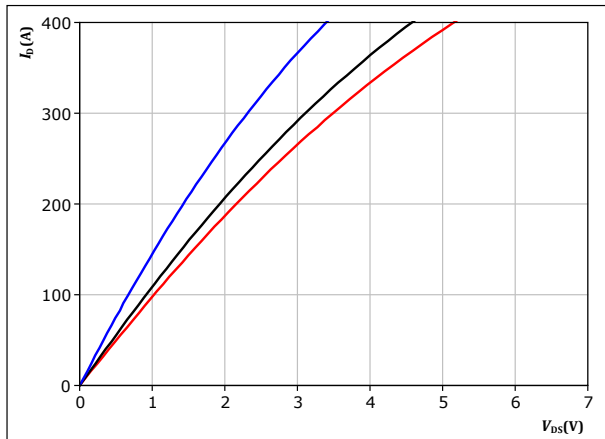


Outer Boost Switch Characteristics

figure 11. MOSFET

Typical output characteristics

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

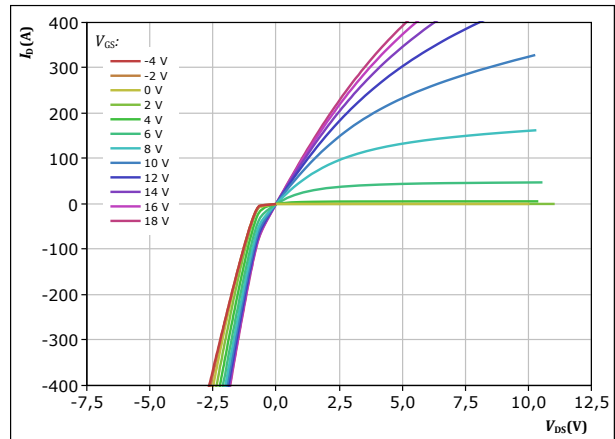


$t_p = 250 \mu s$
 $V_{GS} = 18 V$
 $T_j: 25^\circ C$
 $125^\circ C$
 $150^\circ C$

figure 12. MOSFET

Typical output characteristics

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

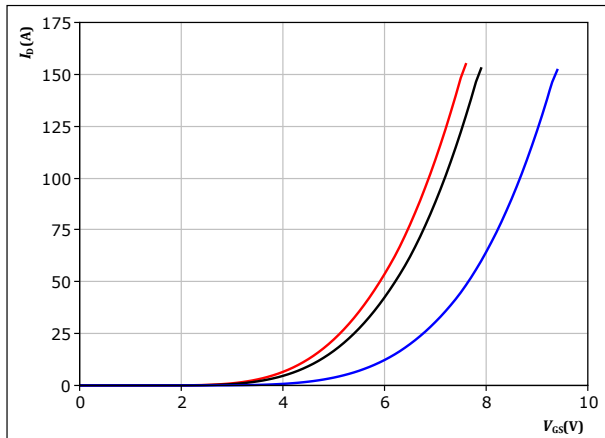


$t_p = 250 \mu s$
 $T_j = 150^\circ C$
 V_{GS} from -4 V to 18 V in steps of 2 V

figure 13. MOSFET

Typical transfer characteristics

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

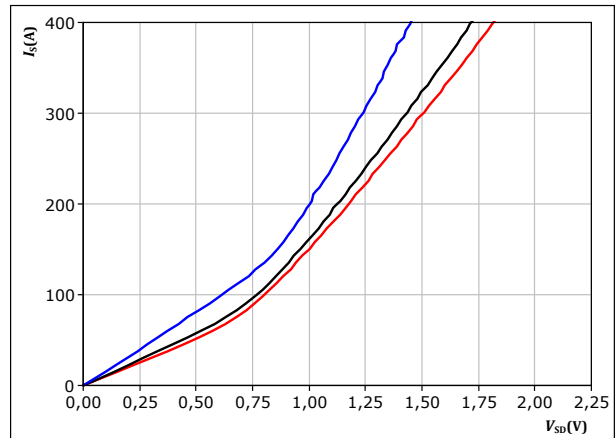


$t_p = 250 \mu s$
 $V_{DS} = 30 V$
 $T_j: 25^\circ C$
 $125^\circ C$
 $150^\circ C$

figure 14. MOSFET

Typical reverse drain current characteristics

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



$t_p = 250 \mu s$
 $V_{GS} = 18 V$
 $T_j: 25^\circ C$
 $125^\circ C$
 $150^\circ C$



Vincotech

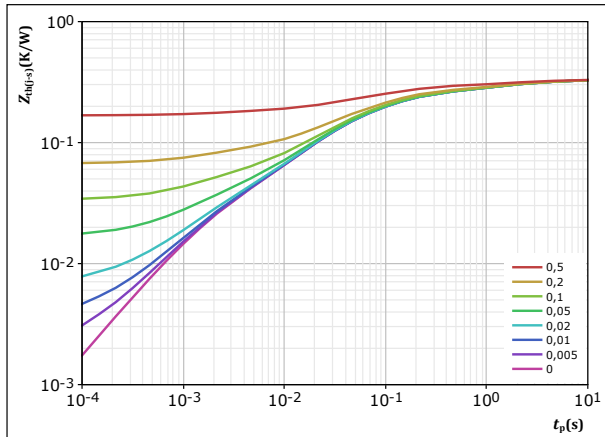
Outer Boost Switch Characteristics

figure 15.

MOSFET

Transient thermal impedance as a function of pulse width

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



$$D = t_p / T$$

$$R_{th(j-a)} = 0,329 \text{ K/W}$$

MOSFET thermal model values

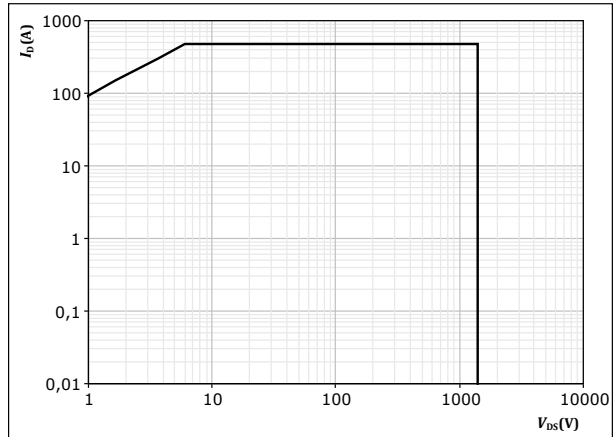
R (K/W)	τ (s)
3,02E-02	7,11E+00
6,31E-02	1,07E+00
1,32E-01	1,01E-01
9,02E-02	2,26E-02
2,00E-02	1,60E-03

figure 16.

MOSFET

Safe operating area

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



$D = \text{single pulse}$

$$T_a = 80 \text{ } ^\circ\text{C}$$

$$V_{GS} = 18 \text{ V}$$

$$T_j = T_{jmax}$$



Vincotech

Outer Boost Diode Characteristics

figure 17.

FWD

Typical forward characteristics

$$I_F = f(V_F)$$

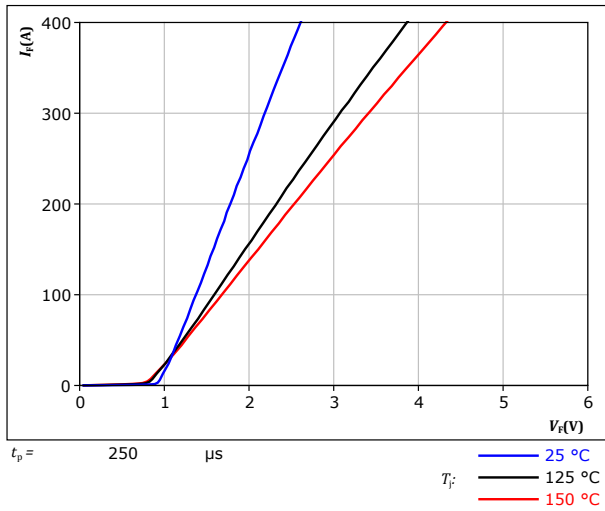
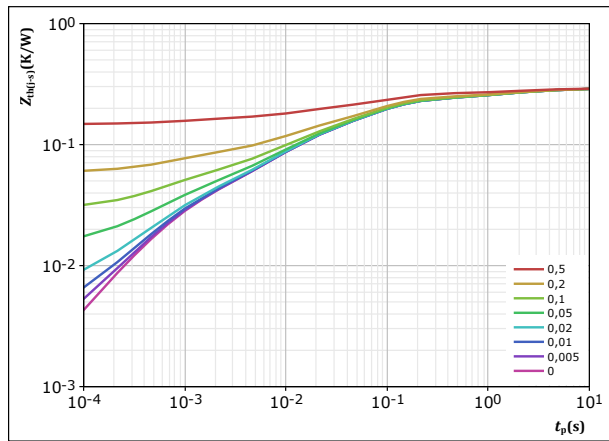


figure 18.

FWD

Transient thermal impedance as a function of pulse width

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





Vincotech

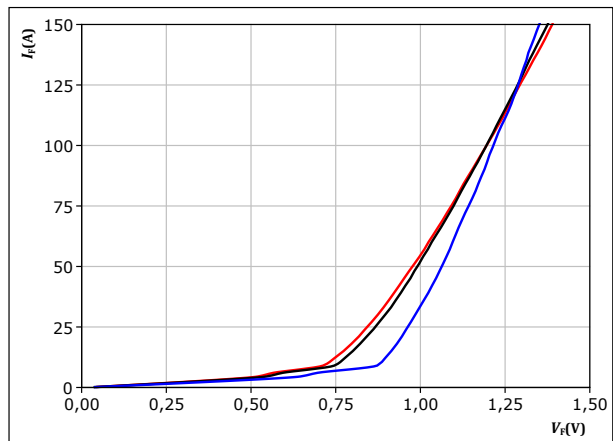
30-EQ14B2A007WS01-PS29F28T datasheet

Outer Boost Sw. Protection Diode Characteristics

figure 19. Rectifier

Typical forward characteristics

$$I_F = f(V_F)$$



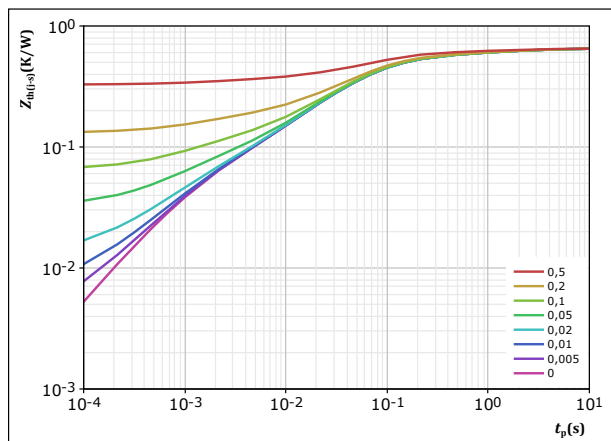
$t_p = 250 \mu s$

T_j :
— 25 °C
— 125 °C
— 150 °C

figure 20. Rectifier

Transient thermal impedance as a function of pulse width

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



$D = t_p / T$
 $R_{th(j-s)} = 0,65 \text{ K/W}$

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



Vincotech

Aux Diode H Characteristics

figure 21.

FWD

Typical forward characteristics

$$I_F = f(V_F)$$

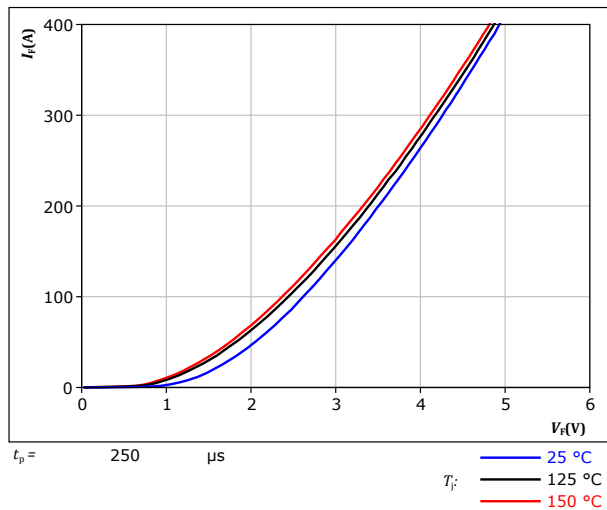
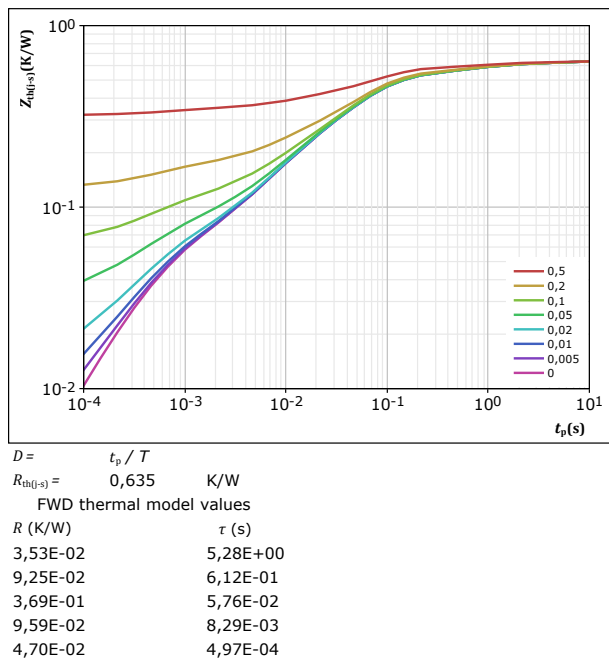


figure 22.

FWD

Transient thermal impedance as a function of pulse width

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





Vincotech

Aux Diode L Characteristics

figure 23.

FWD

Typical forward characteristics

$$I_F = f(V_F)$$

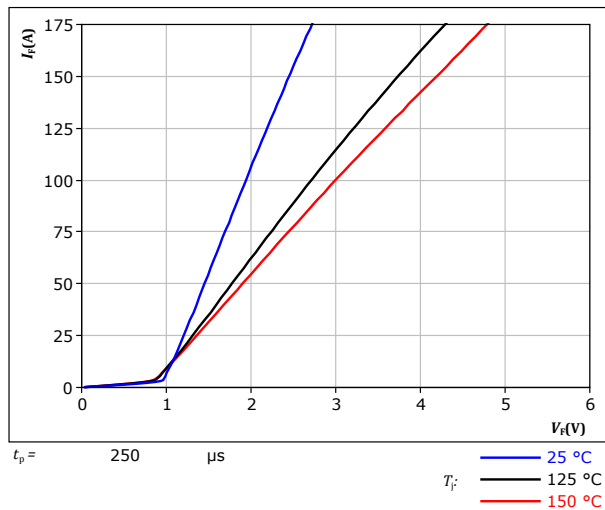
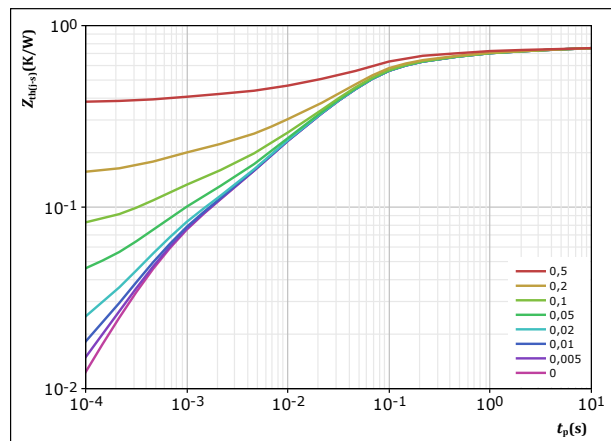


figure 24.

FWD

Transient thermal impedance as a function of pulse width

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





Vincotech

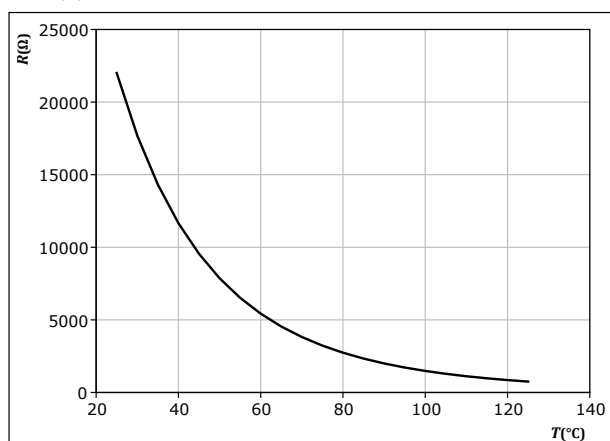
Thermistor Characteristics

figure 25.

Thermistor

Typical NTC characteristic as function of temperature

$$R_T = f(T)$$





Vincotech

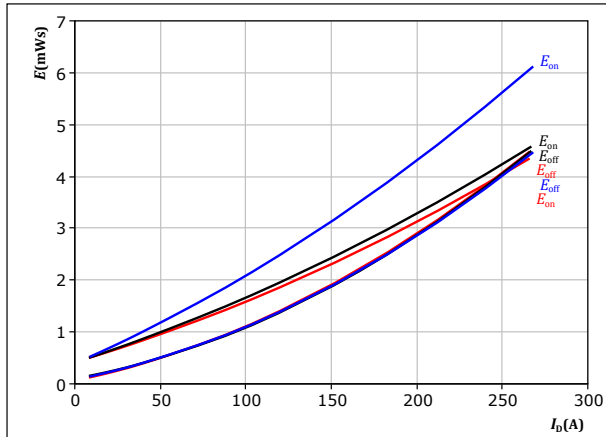
30-EQ14B2A007WS01-PS29F28T datasheet

Inner Boost Switching Characteristics

figure 26. MOSFET

Typical switching energy losses as a function of drain current

$$E = f(I_D)$$



With an inductive load at

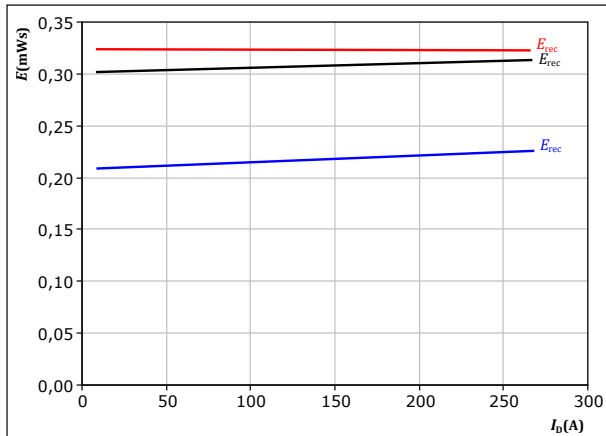
$V_{DS} = 800$ V
 $V_{GS} = -4/18$ V
 $R_{gon} = 2$ Ω
 $R_{goff} = 2$ Ω

T_j : 25 °C
125 °C
150 °C

figure 28. FWD

Typical reverse recovered energy loss as a function of drain current

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



With an inductive load at

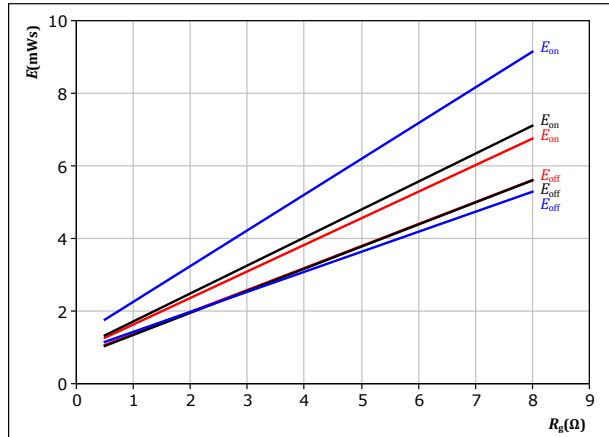
$V_{DS} = 800$ V
 $V_{GS} = -4/18$ V
 $R_{gon} = 2$ Ω

T_j : 25 °C
125 °C
150 °C

figure 27. MOSFET

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

$$E = f(R_g)$$



With an inductive load at

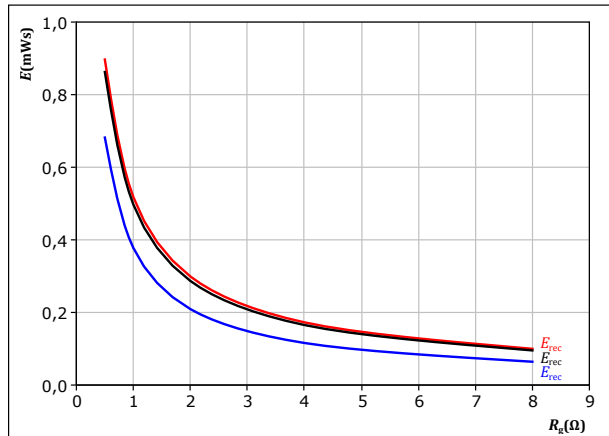
$V_{DS} = 800$ V
 $V_{GS} = -4/18$ V
 $I_D = 150$ A

T_j : 25 °C
125 °C
150 °C

figure 29. 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
 $V_{GS} = -4/18$ V
 $I_D = 150$ A

T_j : 25 °C
125 °C
150 °C



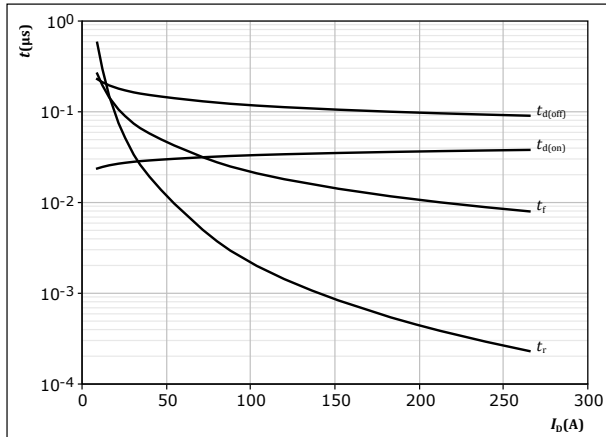
Vincotech

30-EQ14B2A007WS01-PS29F28T datasheet

Inner Boost Switching Characteristics

figure 30. MOSFET

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

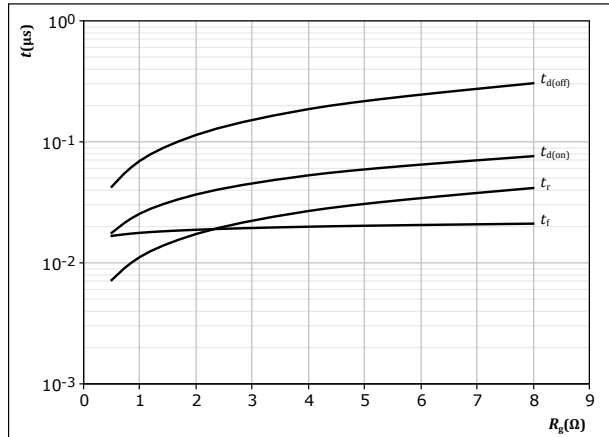


With an inductive load at

$T_j = 150$ °C
 $V_{DS} = 800$ V
 $V_{GS} = -4/18$ V
 $R_{gon} = 2$ Ω
 $R_{goff} = 2$ Ω

figure 31. MOSFET

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

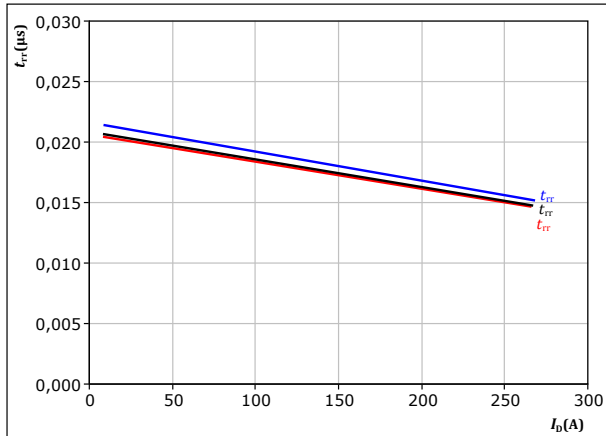


With an inductive load at

$T_j = 150$ °C
 $V_{DS} = 800$ V
 $V_{GS} = -4/18$ V
 $I_D = 150$ A

figure 32. FWD

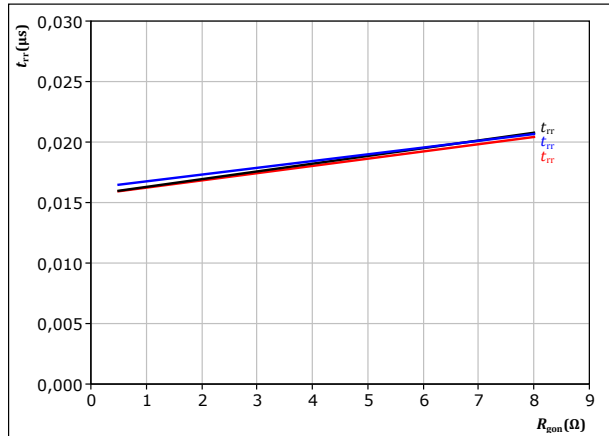
Typical reverse recovery time as a function of drain current
 $t_{rr} = f(I_D)$



At $V_{DS} = 800$ V
 $V_{GS} = -4/18$ V
 $R_{gon} = 2$ Ω
 T_j : 25 °C (blue), 125 °C (black), 150 °C (red)

figure 33. FWD

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



At $V_{DS} = 800$ V
 $V_{GS} = -4/18$ V
 $I_D = 150$ A
 T_j : 25 °C (blue), 125 °C (black), 150 °C (red)



Vincotech

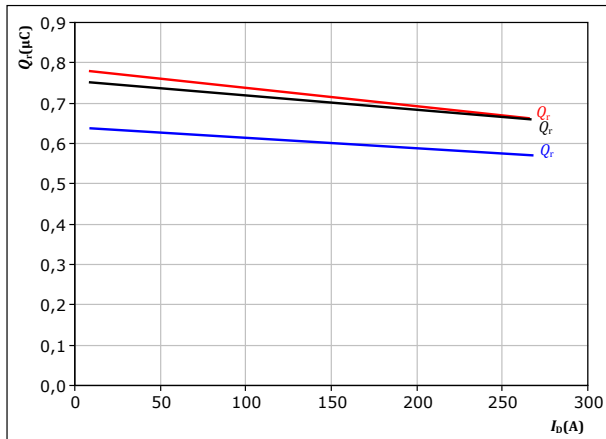
30-EQ14B2A007WS01-PS29F28T datasheet

Inner Boost Switching Characteristics

figure 34. FWD

Typical recovered charge as a function of drain current

$$Q_r = f(I_D)$$

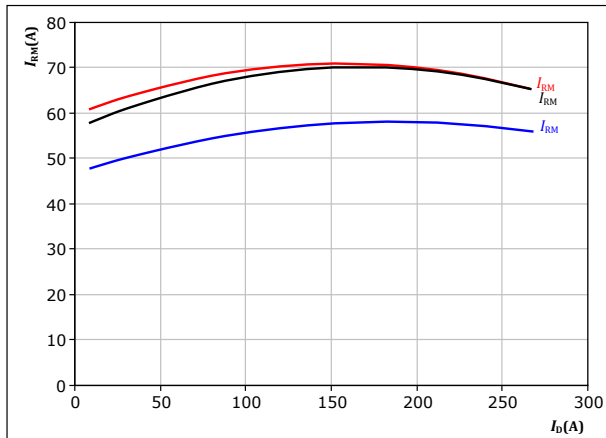


At $V_{DS} = 800$ V
 $V_{GS} = -4/18$ V
 $R_{gon} = 2$ Ω
 T_j : 25 °C
125 °C
150 °C

figure 36. FWD

Typical peak reverse recovery current as a function of drain current

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

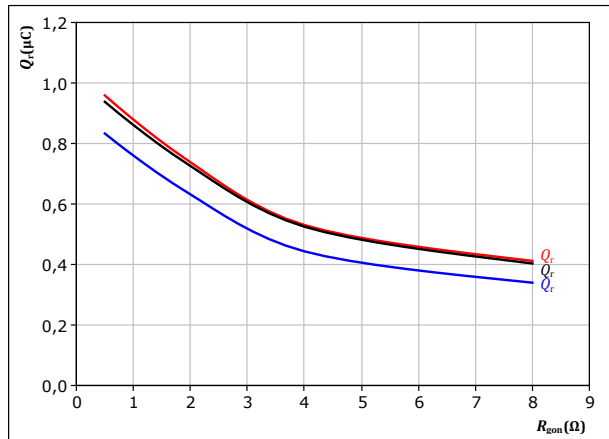


At $V_{DS} = 800$ V
 $V_{GS} = -4/18$ V
 $R_{gon} = 2$ Ω
 T_j : 25 °C
125 °C
150 °C

figure 35. FWD

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

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

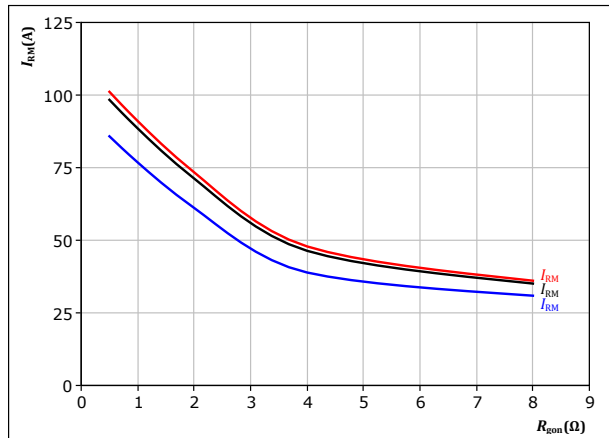


At $V_{DS} = 800$ V
 $V_{GS} = -4/18$ V
 $I_D = 150$ A
 T_j : 25 °C
125 °C
150 °C

figure 37. 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
 $V_{GS} = -4/18$ V
 $I_D = 150$ A
 T_j : 25 °C
125 °C
150 °C



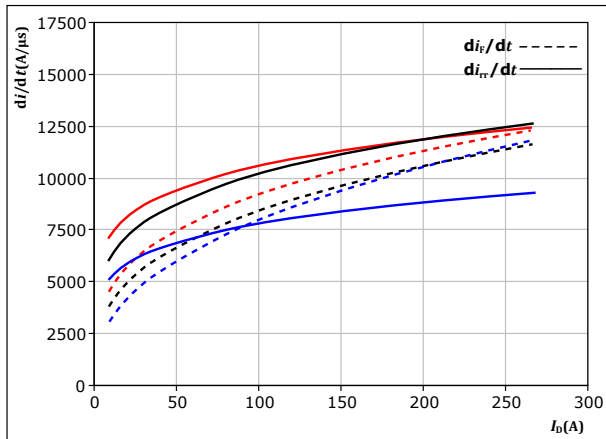
Vincotech

30-EQ14B2A007WS01-PS29F28T datasheet

Inner Boost Switching Characteristics

figure 38. FWD

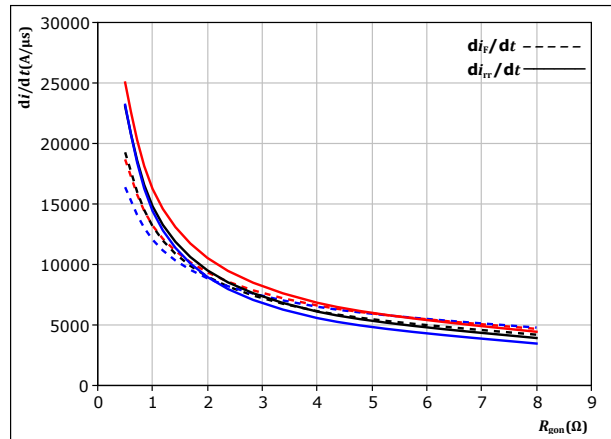
Typical rate of fall of forward and reverse recovery current as a function of drain current
 $di_f/dt, di_r/dt = f(I_D)$



At $V_{DS} = 800$ V
 $V_{GS} = -4/18$ V
 $R_{gon} = 2$ Ω
 $T_j = 25$ °C
 125 °C
 150 °C

figure 39. FWD

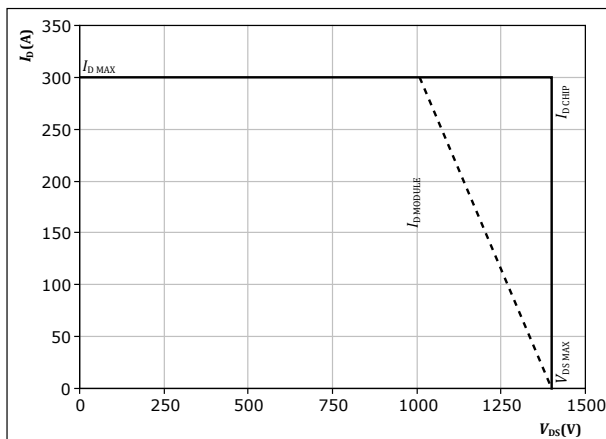
Typical rate of fall of forward and reverse recovery current as a function of turn on gate resistor
 $di_f/dt, di_r/dt = f(R_{gon})$



At $V_{DS} = 800$ V
 $V_{GS} = -4/18$ V
 $I_D = 150$ A
 $T_j = 25$ °C
 125 °C
 150 °C

figure 40. MOSFET

Reverse bias safe operating area
 $I_D = f(V_{DS})$



At $T_j = 150$ °C
 $R_{gon} = 2$ Ω
 $R_{goff} = 2$ Ω



Vincotech

30-EQ14B2A007WS01-PS29F28T

datasheet

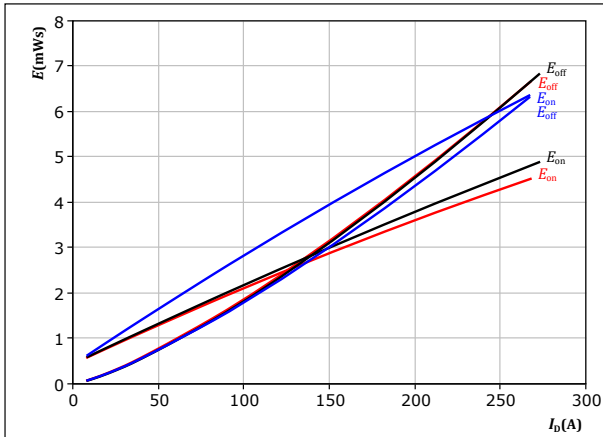
Outer Boost Switching Characteristics

figure 41.

MOSFET

Typical switching energy losses as a function of drain current

$$E = f(I_D)$$



With an inductive load at

$V_{DS} = 800 \text{ V}$
 $V_{GS} = -4/18 \text{ V}$
 $R_{gon} = 4 \text{ } \Omega$
 $R_{goff} = 4 \text{ } \Omega$

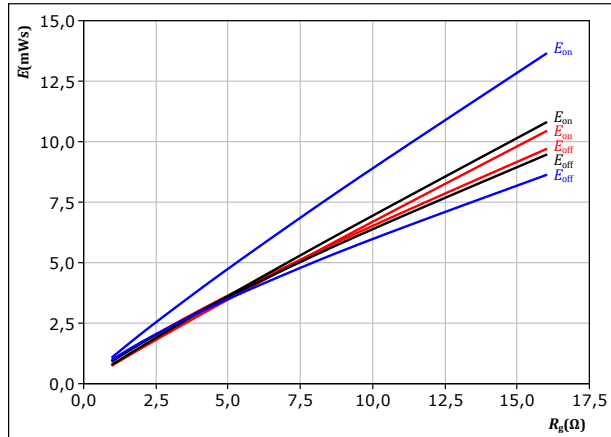
T_j : 25 °C
125 °C
150 °C

figure 42.

MOSFET

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

$$E = f(R_g)$$



With an inductive load at

$V_{DS} = 800 \text{ V}$
 $V_{GS} = -4/18 \text{ V}$
 $I_D = 150 \text{ A}$

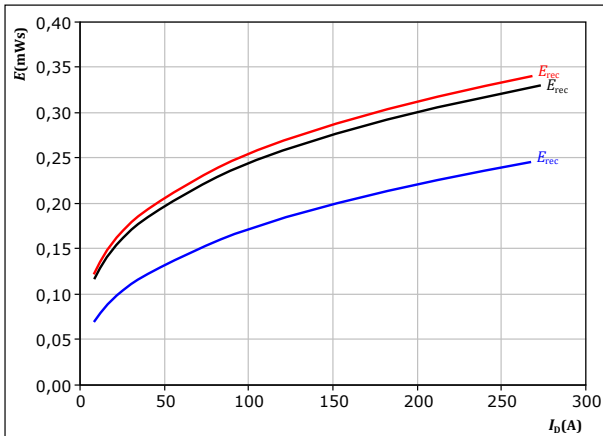
T_j : 25 °C
125 °C
150 °C

figure 43.

FWD

Typical reverse recovered energy loss as a function of drain current

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



With an inductive load at

$V_{DS} = 800 \text{ V}$
 $V_{GS} = -4/18 \text{ V}$
 $R_{gon} = 4 \text{ } \Omega$

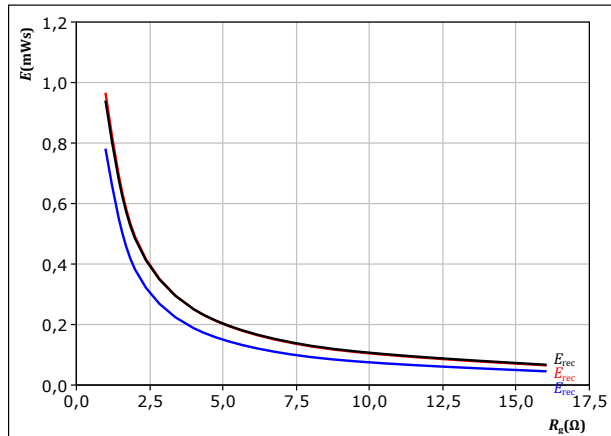
T_j : 25 °C
125 °C
150 °C

figure 44.

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

$V_{DS} = 800 \text{ V}$
 $V_{GS} = -4/18 \text{ V}$
 $I_D = 150 \text{ A}$

T_j : 25 °C
125 °C
150 °C



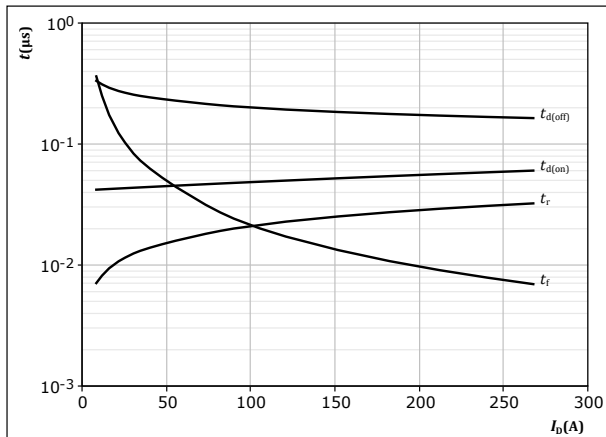
Vincotech

30-EQ14B2A007WS01-PS29F28T datasheet

Outer Boost Switching Characteristics

figure 45. MOSFET

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

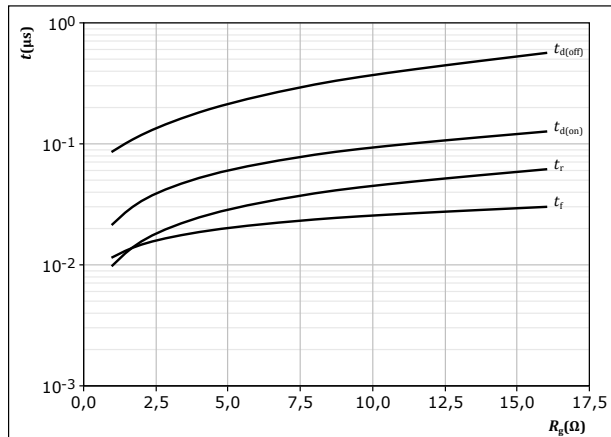


With an inductive load at

$T_j = 150$ °C
 $V_{DS} = 800$ V
 $V_{GS} = -4/18$ V
 $R_{gon} = 4$ Ω
 $R_{goff} = 4$ Ω

figure 46. MOSFET

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

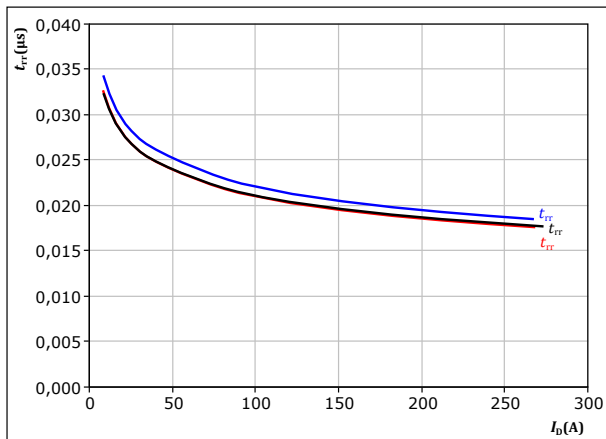


With an inductive load at

$T_j = 150$ °C
 $V_{DS} = 800$ V
 $V_{GS} = -4/18$ V
 $I_D = 150$ A

figure 47. FWD

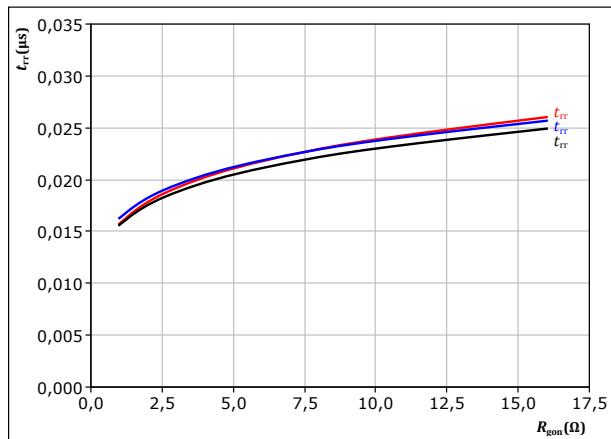
Typical reverse recovery time as a function of drain current
 $t_{rr} = f(I_D)$



At $V_{DS} = 800$ V
 $V_{GS} = -4/18$ V
 $R_{gon} = 4$ Ω
 T_j : 25 °C (blue), 125 °C (black), 150 °C (red)

figure 48. FWD

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



At $V_{DS} = 800$ V
 $V_{GS} = -4/18$ V
 $I_D = 150$ A
 T_j : 25 °C (blue), 125 °C (black), 150 °C (red)



Vincotech

30-EQ14B2A007WS01-PS29F28T datasheet

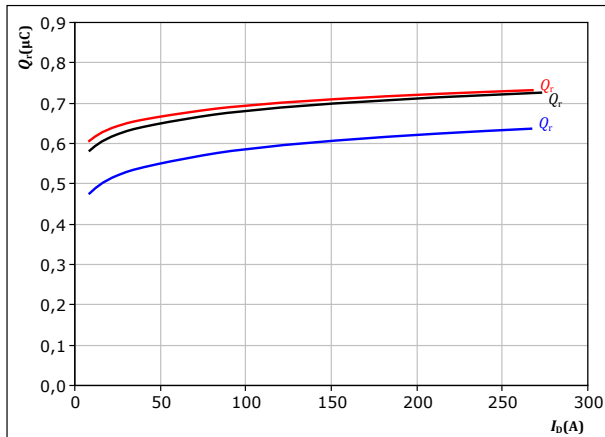
Outer Boost Switching Characteristics

figure 49.

FWD

Typical recovered charge as a function of drain current

$$Q_r = f(I_D)$$



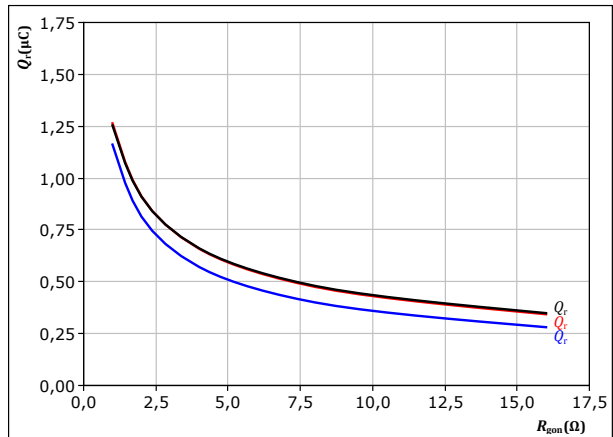
At $V_{DS} = 800$ V
 $V_{GS} = -4/18$ V
 $R_{gon} = 4$ Ω
 T_j : 25 °C
125 °C
150 °C

figure 50.

FWD

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

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



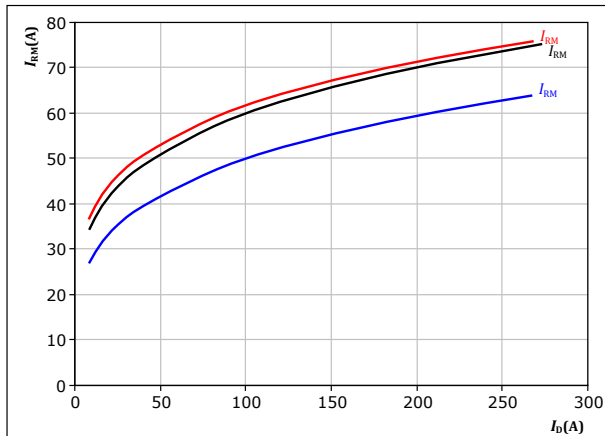
At $V_{DS} = 800$ V
 $V_{GS} = -4/18$ V
 $I_D = 150$ A
 T_j : 25 °C
125 °C
150 °C

figure 51.

FWD

Typical peak reverse recovery current as a function of drain current

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



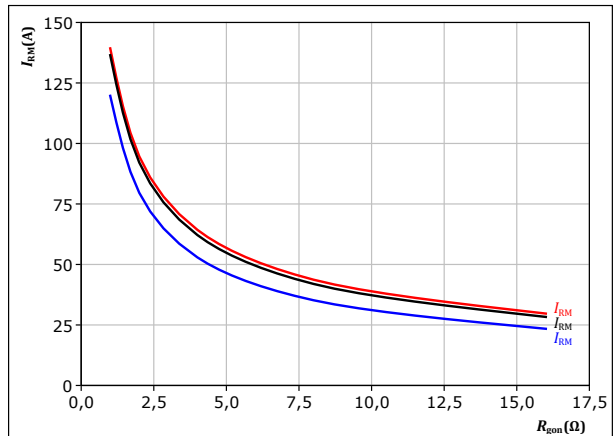
At $V_{DS} = 800$ V
 $V_{GS} = -4/18$ V
 $R_{gon} = 4$ Ω
 T_j : 25 °C
125 °C
150 °C

figure 52.

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
 $V_{GS} = -4/18$ V
 $I_D = 150$ A
 T_j : 25 °C
125 °C
150 °C



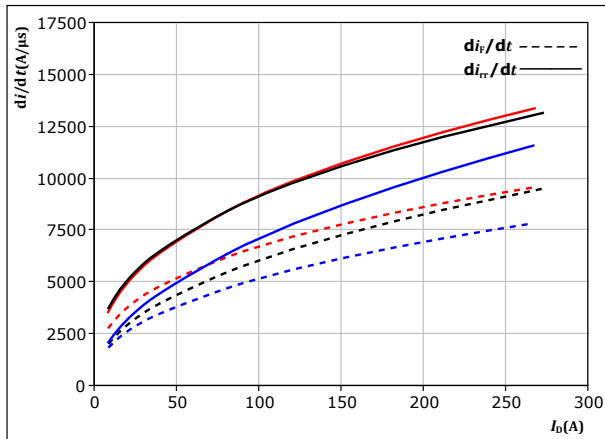
Vincotech

30-EQ14B2A007WS01-PS29F28T datasheet

Outer Boost Switching Characteristics

figure 53. FWD

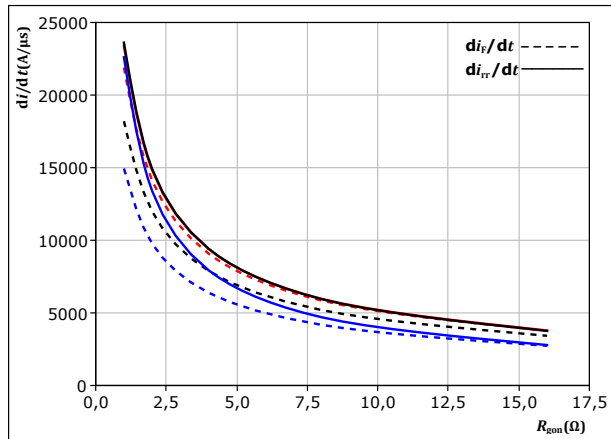
Typical rate of fall of forward and reverse recovery current as a function of drain current
 $di_f/dt, di_r/dt = f(I_D)$



At $V_{DS} = 800$ V
 $V_{GS} = -4/18$ V
 $R_{gon} = 4$ Ω
 T_j : 25 °C
125 °C
150 °C

figure 54. FWD

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

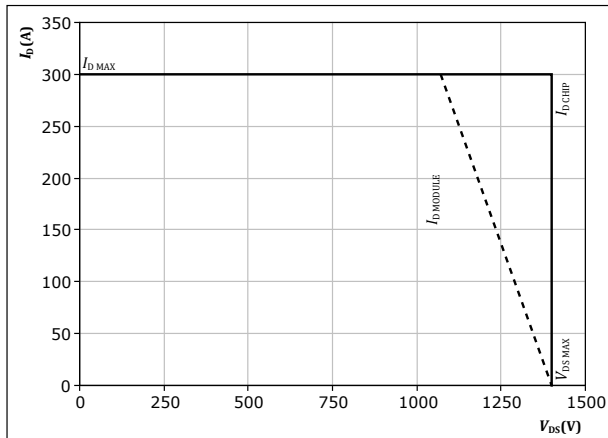


At $V_{DS} = 800$ V
 $V_{GS} = -4/18$ V
 $I_D = 150$ A
 T_j : 25 °C
125 °C
150 °C

figure 55. MOSFET

Reverse bias safe operating area

$I_D = f(V_{DS})$



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



Vincotech

Switching Definitions

figure 56. MOSFET

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

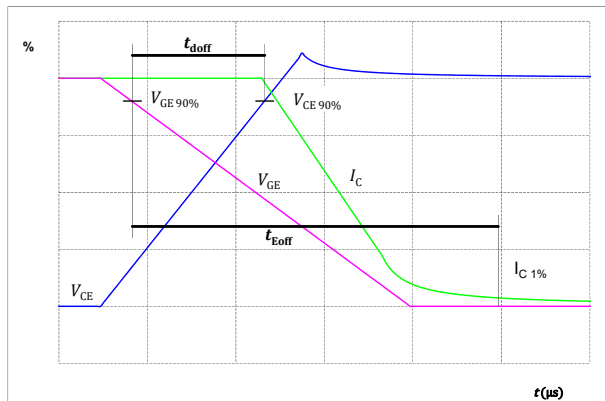


figure 57. MOSFET

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

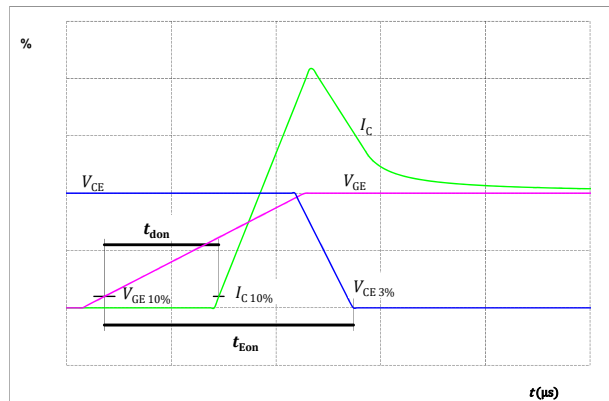


figure 58. MOSFET

Turn-off Switching Waveforms & definition of t_f

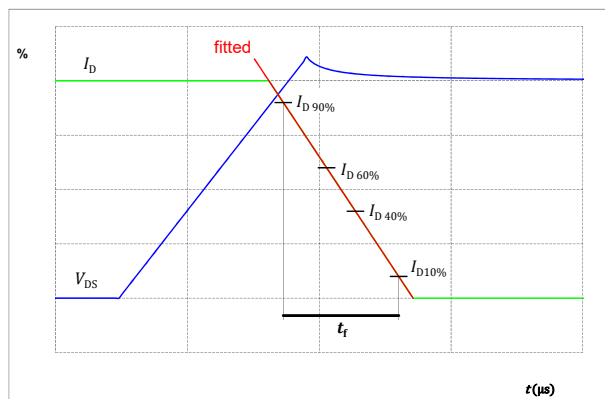
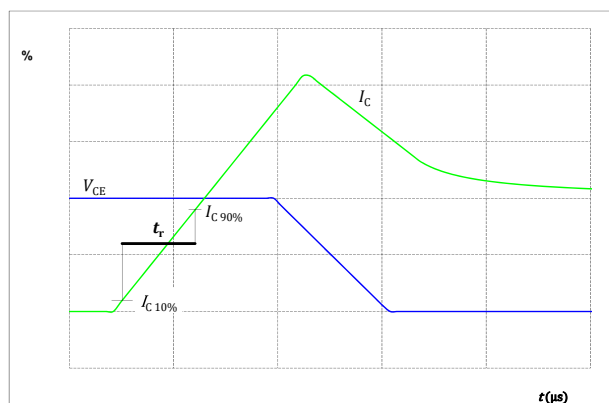


figure 59. MOSFET

Turn-on Switching Waveforms & definition of t_r





Vincotech

Switching Definitions

figure 60.

FWD

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

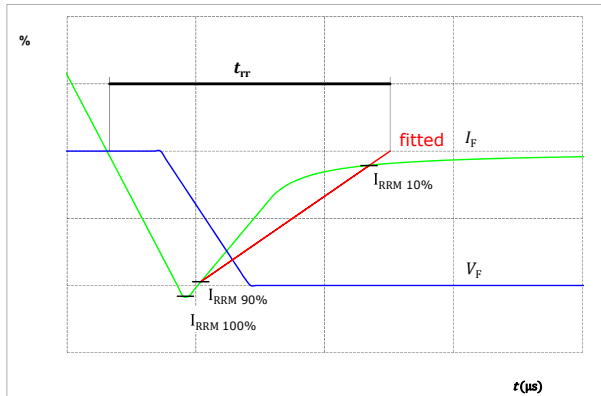


figure 61.

FWD

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

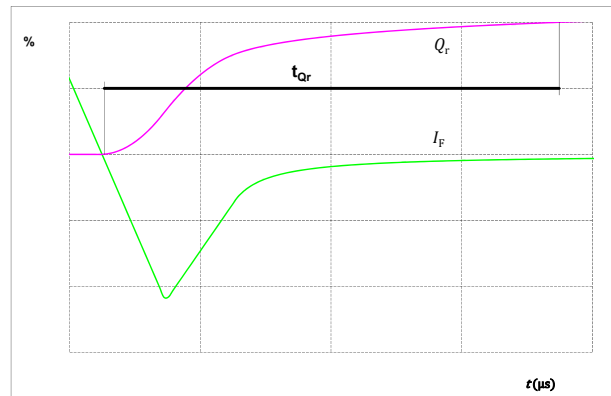
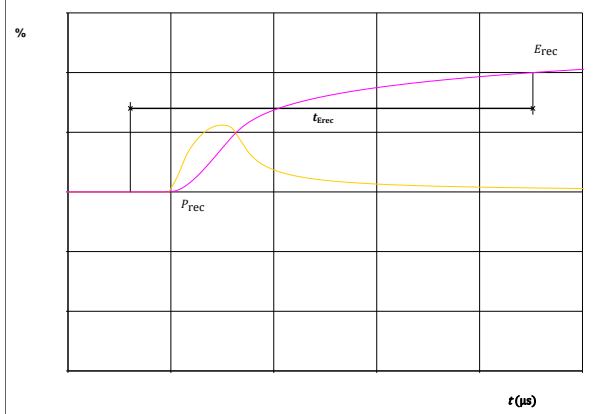


figure 62.

FWD


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





30-EQ14B2A007WS01-PS29F28T
datasheet

Ordering Code	
Version	Ordering Code
Without thermal paste	30-EQ14B2A007WS01-PS29F28T
With thermal paste (5.2 W/mK. PTM6000HV)	30-EO14B2A007WS01-PS29F28T-//

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

Outline							
Pin table [mm]							
Pin	X	Y	Function	33	48,26	49,8	FC21
1	0,05	0	C12	34	40,21	47,1	C21
2	2,75	0	C12	35	40,21	49,8	C21
3	17,15	0	DC-Boost1	36	34,55	49,8	C11
4	19,85	0	DC-Boost1	37	34,55	47,1	C11
5	19,85	2,7	DC-Boost1	38	26,5	49,8	FC11
6	17,15	2,7	DC-Boost1	39	23,8	49,8	FC11
7	31,85	0	DC+Boost1	40	23,8	47,1	FC11
8	34,55	0	DC+Boost1	41	21,1	49,8	FC11
9	34,55	2,7	DC+Boost1	42	14,1	49,8	FC12
10	31,85	2,7	DC+Boost1	43	11,4	49,8	FC12
11	42,91	2,7	DC+Boost2	44	8,7	49,8	FC12
12	40,21	2,7	DC+Boost2	45	6	49,8	FC12
13	40,21	0	DC+Boost2	46	3	49,8	S15
14	42,91	0	DC+Boost2	47	0	49,8	G15
15	57,61	2,7	DC-Boost2	48	2,1	28,75	FC12
16	54,91	2,7	DC-Boost2	49	0,05	22,05	S17
17	54,91	0	DC-Boost2	50	1,05	19,05	G17
18	57,61	0	DC-Boost2	51	17,25	26,9	Boost1
19	72,01	0	C22	52	17,25	29,6	Boost1
20	74,71	0	C22	53	19,95	29,6	Boost1
21	73,71	19,05	G27	54	19,95	32,3	Boost1
22	74,71	22,05	S27	55	24,1	23,9	FC11
23	72,66	28,75	FC22	56	34,55	33,7	Therm11
24	74,76	49,8	G25	57	34,55	30,7	Therm12
25	71,76	49,8	S25	58	not assembled		
26	68,76	49,8	FC22	59	not assembled		
27	66,06	49,8	FC22	60	50,66	23,9	FC21
28	63,36	49,8	FC22	61	57,51	26,9	Boost2
29	60,66	49,8	FC22	62	57,51	29,6	Boost2
30	53,66	49,8	FC21	63	54,81	29,6	Boost2
31	50,96	49,8	FC21	64	54,81	32,3	Boost2
32	50,96	47,1	FC21				

Technical drawing of the PCB showing top and bottom views with dimensions and component locations.

Top view dimensions: 100,00 (width), 60,00 (height), 10,00 (mounting hole diameter), 12,00 (mounting hole pitch), 14,00 (mounting hole offset), 16,00 (mounting hole offset), 18,00 (mounting hole offset), 20,00 (mounting hole offset), 22,00 (mounting hole offset), 24,00 (mounting hole offset), 26,00 (mounting hole offset), 28,00 (mounting hole offset), 30,00 (mounting hole offset), 32,00 (mounting hole offset), 34,00 (mounting hole offset), 36,00 (mounting hole offset), 38,00 (mounting hole offset), 40,00 (mounting hole offset), 42,00 (mounting hole offset), 44,00 (mounting hole offset), 46,00 (mounting hole offset), 48,00 (mounting hole offset), 50,00 (mounting hole offset), 52,00 (mounting hole offset), 54,00 (mounting hole offset), 56,00 (mounting hole offset), 58,00 (mounting hole offset), 60,00 (mounting hole offset), 62,00 (mounting hole offset), 64,00 (mounting hole offset), 66,00 (mounting hole offset), 68,00 (mounting hole offset), 70,00 (mounting hole offset), 72,00 (mounting hole offset), 74,00 (mounting hole offset), 76,00 (mounting hole offset), 78,00 (mounting hole offset), 80,00 (mounting hole offset), 82,00 (mounting hole offset), 84,00 (mounting hole offset), 86,00 (mounting hole offset), 88,00 (mounting hole offset), 90,00 (mounting hole offset), 92,00 (mounting hole offset), 94,00 (mounting hole offset), 96,00 (mounting hole offset), 98,00 (mounting hole offset).

Bottom view dimensions: 100,00 (width), 60,00 (height), 10,00 (mounting hole diameter), 12,00 (mounting hole pitch), 14,00 (mounting hole offset), 16,00 (mounting hole offset), 18,00 (mounting hole offset), 20,00 (mounting hole offset), 22,00 (mounting hole offset), 24,00 (mounting hole offset), 26,00 (mounting hole offset), 28,00 (mounting hole offset), 30,00 (mounting hole offset), 32,00 (mounting hole offset), 34,00 (mounting hole offset), 36,00 (mounting hole offset), 38,00 (mounting hole offset), 40,00 (mounting hole offset), 42,00 (mounting hole offset), 44,00 (mounting hole offset), 46,00 (mounting hole offset), 48,00 (mounting hole offset), 50,00 (mounting hole offset), 52,00 (mounting hole offset), 54,00 (mounting hole offset), 56,00 (mounting hole offset), 58,00 (mounting hole offset), 60,00 (mounting hole offset), 62,00 (mounting hole offset), 64,00 (mounting hole offset), 66,00 (mounting hole offset), 68,00 (mounting hole offset), 70,00 (mounting hole offset), 72,00 (mounting hole offset), 74,00 (mounting hole offset), 76,00 (mounting hole offset), 78,00 (mounting hole offset), 80,00 (mounting hole offset), 82,00 (mounting hole offset), 84,00 (mounting hole offset), 86,00 (mounting hole offset), 88,00 (mounting hole offset), 90,00 (mounting hole offset), 92,00 (mounting hole offset), 94,00 (mounting hole offset), 96,00 (mounting hole offset), 98,00 (mounting hole offset).

Notes: 1. All dimensions are in mm. 2. All dimensions are to the center of the hole. 3. All dimensions are to the center of the hole. 4. All dimensions are to the center of the hole. 5. All dimensions are to the center of the hole. 6. All dimensions are to the center of the hole. 7. All dimensions are to the center of the hole. 8. All dimensions are to the center of the hole. 9. All dimensions are to the center of the hole. 10. All dimensions are to the center of the hole. 11. All dimensions are to the center of the hole. 12. All dimensions are to the center of the hole. 13. All dimensions are to the center of the hole. 14. All dimensions are to the center of the hole. 15. All dimensions are to the center of the hole. 16. All dimensions are to the center of the hole. 17. All dimensions are to the center of the hole. 18. All dimensions are to the center of the hole. 19. All dimensions are to the center of the hole. 20. All dimensions are to the center of the hole. 21. All dimensions are to the center of the hole. 22. All dimensions are to the center of the hole. 23. All dimensions are to the center of the hole. 24. All dimensions are to the center of the hole. 25. All dimensions are to the center of the hole. 26. All dimensions are to the center of the hole. 27. All dimensions are to the center of the hole. 28. All dimensions are to the center of the hole. 29. All dimensions are to the center of the hole. 30. All dimensions are to the center of the hole.



datasheet

Pinout

The schematic diagram illustrates the power and control circuit for the 12VDC/10A power supply. It features two identical power stages (left and right) and a temperature sensing stage.

Power Stages:

- Left Stage:**
 - Input: DC+Boost1 (pins 7, 8, 9, 10).
 - Rectifier: D17, D15, D19, D18.
 - Active Filter: T15, D45.
 - Output: DC-Boost1 (pins 3, 4, 5, 6).
- Right Stage:**
 - Input: DC+Boost2 (pins 11, 12, 13, 14).
 - Rectifier: D27, D25, D29, D28.
 - Active Filter: T25, D55.
 - Output: DC-Boost2 (pins 15, 16, 17, 18).

Temperature Sensing Stage:

- Input: Therm11 (pin 56) and Therm12 (pin 57).
- Thermistor: Rt10.

Identification					
ID	Component	Voltage	Current	Function	Comment
T15, T25	MOSFET	1400 V	5,43 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	5,43 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	



Vincotech

30-EQ14B2A007WS01-PS29F28T
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-EQ14B2A007WS01-PS29F28T-D1-14	11 Dec. 2025	Initial Release	

DISCLAIMER

The information, specifications, procedures, methods and recommendations herein (together "information") are presented by Vincotech to reader in good faith, are believed to be accurate and reliable, but may well be incomplete and/or not applicable to all conditions or situations that may exist or occur. Vincotech reserves the right to make any changes without further notice to any products to improve reliability, function or design. No representation, guarantee or warranty is made to reader as to the accuracy, reliability or completeness of said information or that the application or use of any of the same will avoid hazards, accidents, losses, damages or injury of any kind to persons or property or that the same will not infringe third parties rights or give desired results. It is reader's sole responsibility to test and determine the suitability of the information and the product for reader's intended use.

LIFE SUPPORT POLICY

Vincotech products are not authorised for use as critical components in life support devices or systems without the express written approval of Vincotech.

As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, or (c) whose failure to perform when properly used in accordance with instructions for use provided in labelling can be reasonably expected to result in significant injury to the user.
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.