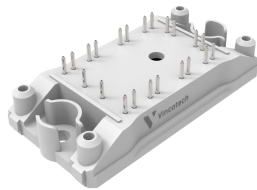
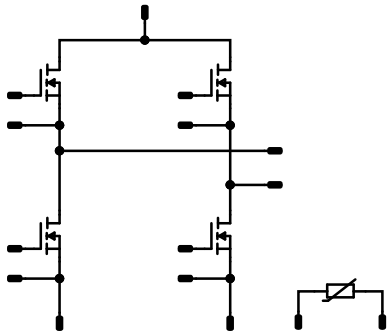




<b>fastPACK 0 SiC</b>		<b>900 V / 17 mΩ</b>	
<b>Features</b>		<b>flow 0 12 mm housing</b>	
<ul style="list-style-type: none"><li>• 900V SiC MOS</li><li>• Switching frequency up to 400kHz</li><li>• Suitable for hard switching/soft switching</li><li>• Increased power density</li><li>• NTC</li></ul>			
<b>Target applications</b>		<b>Schematic</b>	
<ul style="list-style-type: none"><li>• Power Supply</li><li>• Special Application</li><li>• Welding &amp; Cutting</li></ul>			
<b>Types</b>			
<ul style="list-style-type: none"><li>• 10-FU094PB017ME05-L620F31</li></ul>			



Vincotech

## Maximum Ratings

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

Parameter	Symbol	Conditions	Value	Unit
<b>H-Bridge Switch - Lo side</b>				
Drain-source voltage	$V_{DSS}$		900	V
Drain current	$I_D$	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	57	A
Peak drain current	$I_{DM}$	$t_p$ limited by $T_{jmax}$	270	A
Avalanche energy, single pulse	$E_{AS}$	$V_{DD} = 50\text{ V}$ $I_D = 66\text{ A}$	330	mJ
Total power dissipation	$P_{tot}$	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	101	W
Gate-source voltage	$V_{GSS}$		-4 / 15	V
		dynamic	-8 / 19	
Maximum Junction Temperature	$T_{jmax}$		175	°C

<b>H-Bridge Switch - Hi side</b>				
Drain-source voltage	$V_{DSS}$		900	V
Drain current	$I_D$	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	57	A
Peak drain current	$I_{DM}$	$t_p$ limited by $T_{jmax}$	270	A
Avalanche energy, single pulse	$E_{AS}$	$V_{DD} = 50\text{ V}$ $I_D = 66\text{ A}$	330	mJ
Total power dissipation	$P_{tot}$	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	101	W
Gate-source voltage	$V_{GSS}$		-4 / 15	V
		dynamic	-8 / 19	
Maximum Junction Temperature	$T_{jmax}$		175	°C



Vincotech

**10-FU094PB017ME05-L620F31**  
datasheet

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

#### Isolation Properties

Isolation voltage	$V_{\text{isol}}$	DC Test Voltage* $t_p = 2\text{ s}$	6000	V
Isolation voltage	$V_{\text{isol}}$	AC Voltage $t_p = 1\text{ min}$	2500	V
Creepage distance			min. 12,7	mm
Clearance			9,52	mm
Comparative Tracking Index	CTI		$\geq 200$	

\*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		

#### H-Bridge Switch - Lo side

##### Static

Drain-source on-state resistance	$r_{DS(on)}$		15		114	25 125 150		23 28 31	26 <sup>(1)</sup>	mΩ
Gate-source threshold voltage	$V_{GS(th)}$		0		0,015	25	1,7	2,4	3,5	V
Gate to Source Leakage Current	$I_{GSS}$		15	0		25		30	750	nA
Zero Gate Voltage Drain Current	$I_{DSS}$		0	900		25		3	300	μA
Internal gate resistance	$r_g$							1,57		Ω
Gate charge	$Q_g$							91,2		nC
Gate to source charge	$Q_{GS}$		-4/15	400	60	25		22,5		
Gate to drain charge	$Q_{GD}$							36		
Short-circuit input capacitance	$C_{iss}$							1980		pF
Short-circuit output capacitance	$C_{oss}$	$f = 1$ Mhz	0	600	0	25		180		
Reverse transfer capacitance	$C_{rss}$							12		
Diode forward voltage	$V_{SD}$		0		0	25		4,8		V

##### Thermal

Thermal resistance junction to sink <sup>(2)</sup>	$R_{th(j-s)}$	$\lambda_{paste} = 3,4$ W/mK (PSX)						0,94		K/W
--	---------------	---------------------------------------	--	--	--	--	--	------	--	-----

##### Dynamic

Turn-on delay time	$t_{d(on)}$					25 125 150		15,2 14,2 15,2		ns
Rise time	$t_r$					25 125 150		6,8 6,2 6,2		ns
Turn-off delay time	$t_{d(off)}$					25 125 150		47,2 48,4 46,8		ns
Fall time	$t_f$					25 125 150		11,4 11,8 10,2		ns
Turn-on energy (per pulse)	$E_{on}$	$Q_{rFWD} = 1,06$ μC $Q_{rFWD} = 1,15$ μC $Q_{rFWD} = 1,32$ μC				25 125 150		0,681 0,607 0,618		mWs
Turn-off energy (per pulse)	$E_{off}$					25 125 150		0,153 0,101 0,095		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		

#### H-Bridge Switch - Hi side

##### Static

Drain-source on-state resistance	$r_{DS(on)}$		15		114	25 125 150		23 28 31	26 <sup>(1)</sup>	mΩ
Gate-source threshold voltage	$V_{GS(th)}$		0		0,015	25	1,7	2,4	3,5	V
Gate to Source Leakage Current	$I_{GSS}$		15	0		25		30	750	nA
Zero Gate Voltage Drain Current	$I_{DSS}$		0	900		25		3	300	μA
Internal gate resistance	$r_g$							1,57		Ω
Gate charge	$Q_g$							91,2		nC
Gate to source charge	$Q_{GS}$		-4/15	400	60	25		22,5		
Gate to drain charge	$Q_{GD}$							36		
Short-circuit input capacitance	$C_{iss}$							1980		pF
Short-circuit output capacitance	$C_{oss}$	$f = 1$ Mhz	0	600	0	25		180		
Reverse transfer capacitance	$C_{rss}$							12		
Diode forward voltage	$V_{SD}$		0		0	25		4,8		V

##### Thermal

Thermal resistance junction to sink <sup>(2)</sup>	$R_{th(j-s)}$	$\lambda_{paste} = 3,4$ W/mK (PSX)						0,94		K/W
--	---------------	---------------------------------------	--	--	--	--	--	------	--	-----

##### Dynamic

Turn-on delay time	$t_{d(on)}$					25 125 150		15,2 14,2 15,2		ns
Rise time	$t_r$					25 125 150		6,8 6,2 6,2		ns
Turn-off delay time	$t_{d(off)}$					25 125 150		47,2 48,4 46,8		ns
Fall time	$t_f$					25 125 150		11,4 11,8 10,2		ns
Turn-on energy (per pulse)	$E_{on}$	$Q_{rFWD} = 1,06$ μC $Q_{rFWD} = 1,15$ μC $Q_{rFWD} = 1,32$ μC				25 125 150		0,681 0,607 0,618		mWs
Turn-off energy (per pulse)	$E_{off}$					25 125 150		0,153 0,101 0,095		mWs



### Characteristic Values

Parameter	Symbol	Conditions					Values			Unit
		$V_{GS}$ [V]	$V_{GE}$ [V]	$V_{DS}$ [V]	$V_{CE}$ [V]	$T_j$ [°C]	Min	Typ	Max	

### Thermistor

#### Static

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

<sup>(1)</sup> Value at chip level

<sup>(2)</sup> Only valid with pre-applied Vincotech thermal interface material.

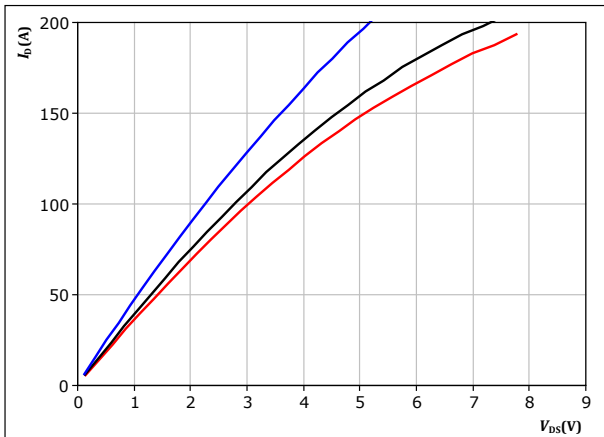


## H-Bridge Switch - Lo side Characteristics

figure 1. MOSFET

Typical output characteristics

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

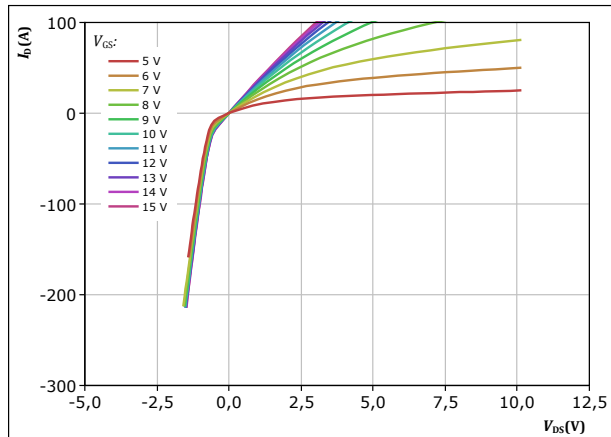


$t_p = 250 \mu s$   
 $V_{GS} = 15 V$   
 $T_j:$  25 °C, 125 °C, 150 °C

figure 2. MOSFET

Typical output characteristics

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

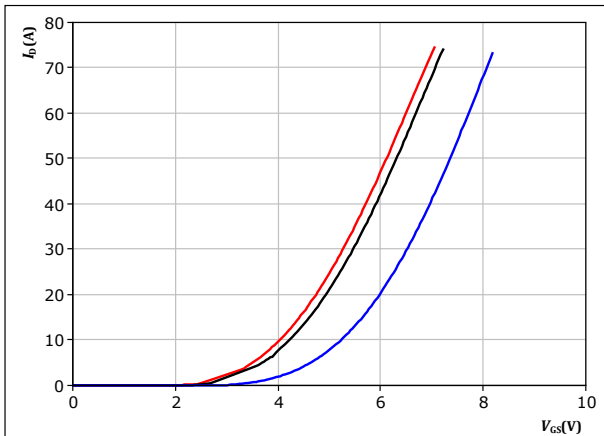


$t_p = 250 \mu s$   
 $T_j = 150 \text{ °C}$   
 $V_{GS}$  from 5 V to 15 V in steps of 1 V

figure 3. MOSFET

Typical transfer characteristics

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

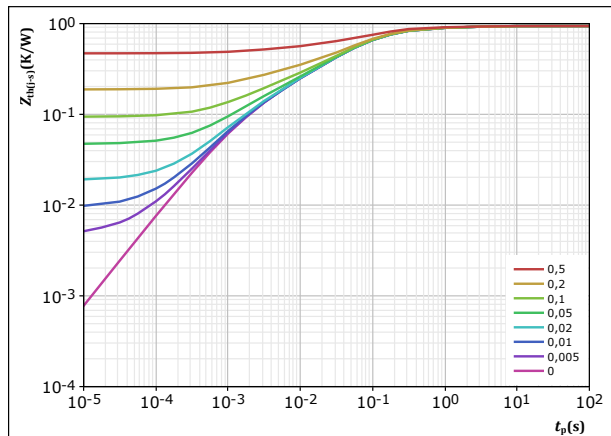


$t_p = 250 \mu s$   
 $V_{DS} = 10 V$   
 $T_j:$  25 °C, 125 °C, 150 °C

figure 4. MOSFET

Transient thermal impedance as a function of pulse width

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



$D = t_p / T$   
 $R_{th(j-s)} = 0,94 \text{ K/W}$   
MOSFET thermal model values  

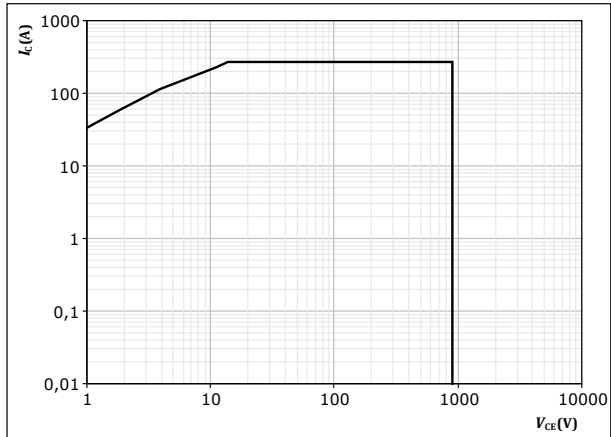
$R$ (K/W)	$\tau$ (s)
4,21E-02	2,99E+00
1,28E-01	4,21E-01
5,28E-01	7,51E-02
1,69E-01	9,86E-03
7,30E-02	1,37E-03



## H-Bridge Switch - Lo side Characteristics

figure 5. MOSFET

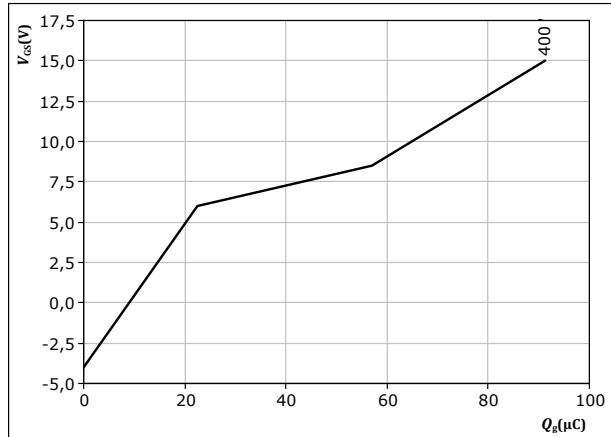
Safe operating area  
 $I_C = f(V_{CE})$



$D =$  single pulse  
 $T_s = 80$  °C  
 $V_{GE} = 15$  V  
 $T_j = T_{jmax}$

figure 6. MOSFET

Gate voltage vs gate charge  
 $V_{GS} = f(Q_g)$



At  $I_D = 38$  A





## H-Bridge Switch - Hi side Characteristics

figure 7. MOSFET

Typical output characteristics  
 $I_D = f(V_{DS})$

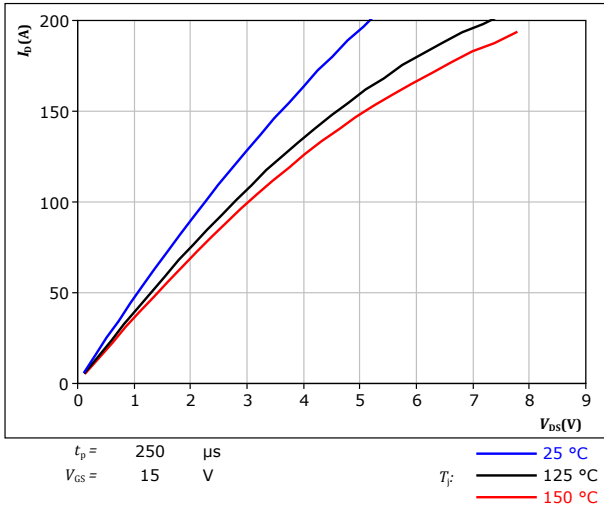


figure 8. MOSFET

Typical output characteristics  
 $I_D = f(V_{DS})$

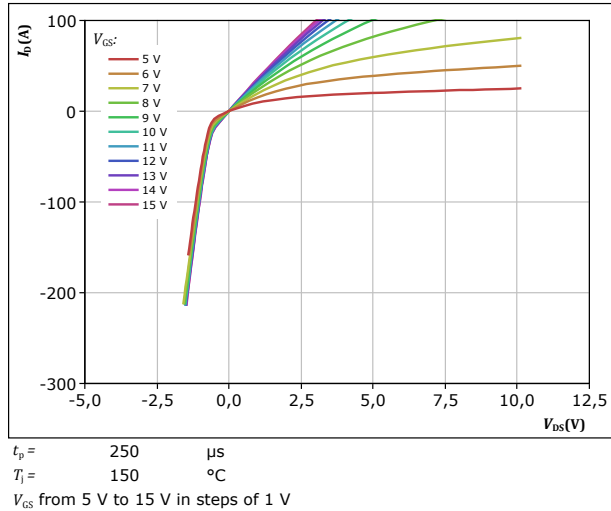


figure 9. MOSFET

Typical transfer characteristics  
 $I_D = f(V_{GS})$

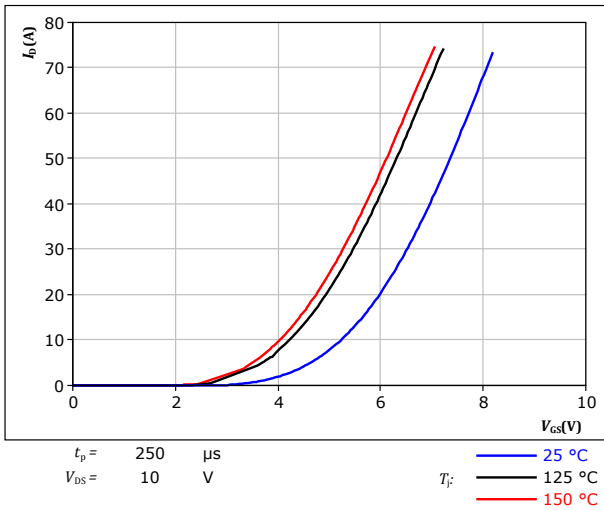
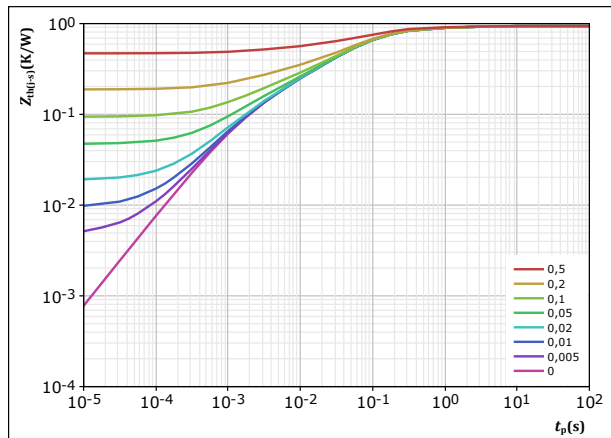


figure 10. MOSFET

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



$D = t_p / T$   
 $R_{th(j-s)} = 0,94 \text{ K/W}$

MOSFET thermal model values

R (K/W)	$\tau$ (s)
4,21E-02	2,99E+00
1,28E-01	4,21E-01
5,28E-01	7,51E-02
1,69E-01	9,86E-03
7,30E-02	1,37E-03

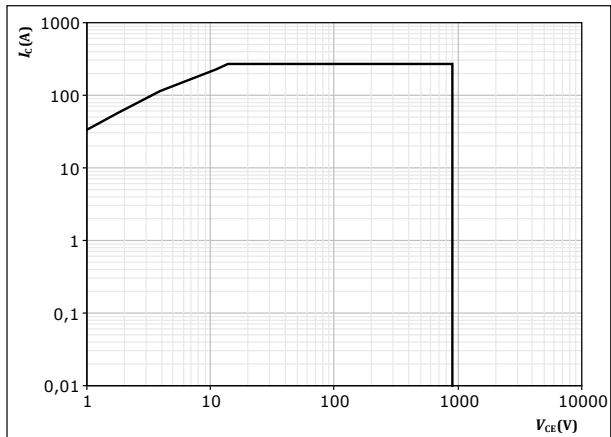


## H-Bridge Switch - Hi side Characteristics

figure 11. MOSFET

Safe operating area

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

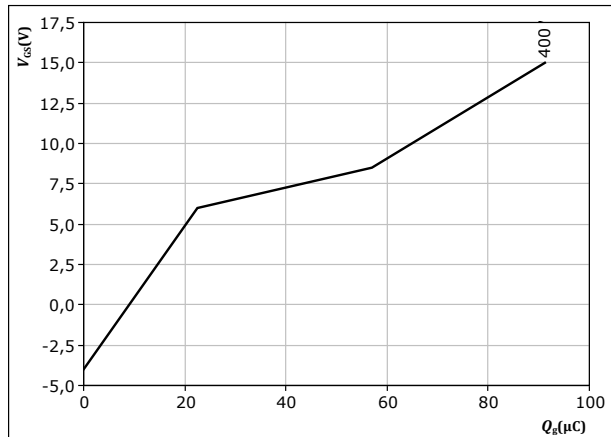


D = single pulse  
T<sub>s</sub> = 80 °C  
V<sub>GE</sub> = 15 V  
T<sub>j</sub> = T<sub>jmax</sub>

figure 12. MOSFET

Gate voltage vs gate charge

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



At I<sub>0</sub> = 38 A

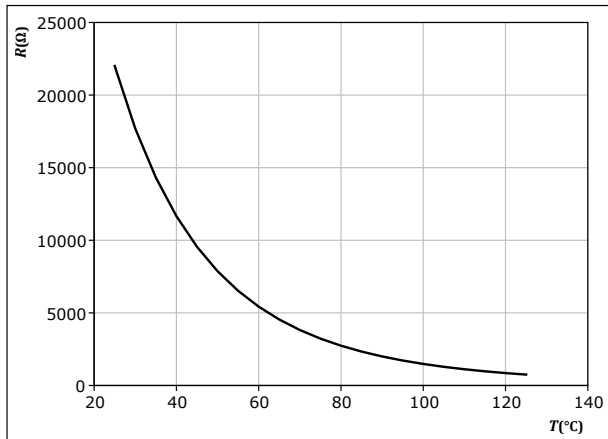


### Thermistor Characteristics

figure 13. Thermistor

Typical NTC characteristic as function of temperature

$$R_T = f(T)$$

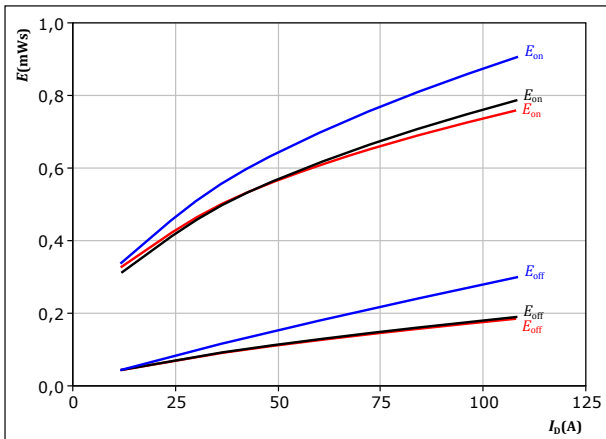




## H-Bridge Switching Characteristics - Lo side

**figure 14.** MOSFET

Typical switching energy losses as a function of drain current  
 $E = f(I_D)$

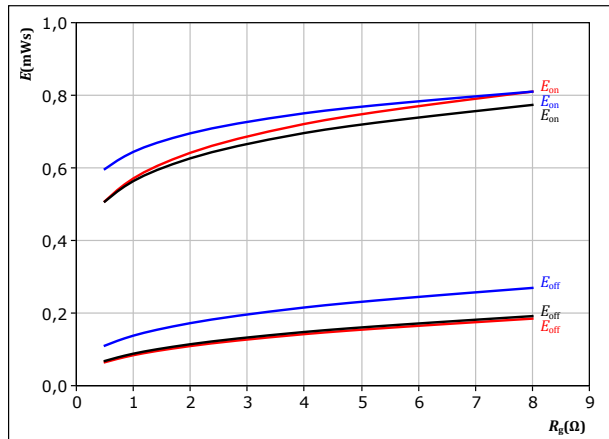


With an inductive load at  
 $V_{DS} = 600 \text{ V}$   
 $V_{GS} = -5/15 \text{ V}$   
 $R_{gon} = 2 \ \Omega$   
 $R_{goff} = 2 \ \Omega$

$T_j$ : 25 °C (blue), 125 °C (black), 150 °C (red)

**figure 15.** MOSFET

Typical switching energy losses as a function of gate resistor  
 $E = f(R_g)$

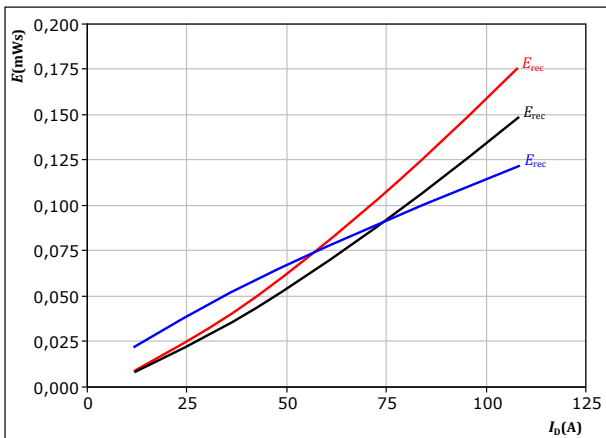


With an inductive load at  
 $V_{DS} = 600 \text{ V}$   
 $V_{GS} = -5/15 \text{ V}$   
 $I_D = 60 \text{ A}$

$T_j$ : 25 °C (blue), 125 °C (black), 150 °C (red)

**figure 16.** MOSFET

Typical reverse recovered energy loss as a function of drain current  
 $E_{rec} = f(I_D)$

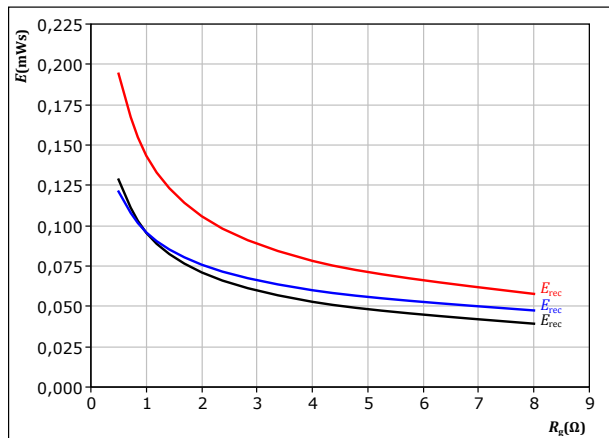


With an inductive load at  
 $V_{DS} = 600 \text{ V}$   
 $V_{GS} = -5/15 \text{ V}$   
 $R_{gon} = 2 \ \Omega$

$T_j$ : 25 °C (blue), 125 °C (black), 150 °C (red)

**figure 17.** MOSFET

Typical reverse recovered energy loss as a function of gate resistor  
 $E_{rec} = f(R_g)$



With an inductive load at  
 $V_{DS} = 600 \text{ V}$   
 $V_{GS} = -5/15 \text{ V}$   
 $I_D = 60 \text{ A}$

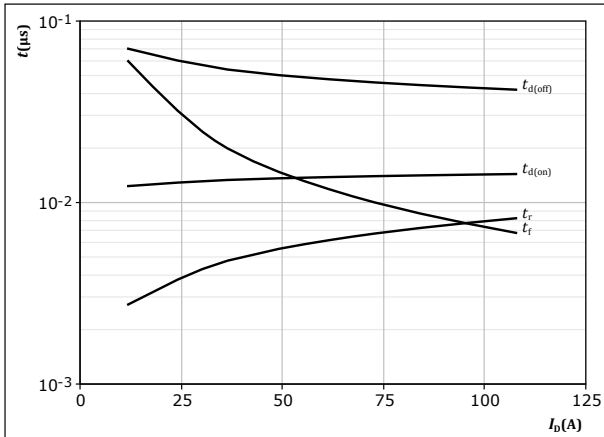
$T_j$ : 25 °C (blue), 125 °C (black), 150 °C (red)



## H-Bridge Switching Characteristics - Lo side

**figure 18.** MOSFET

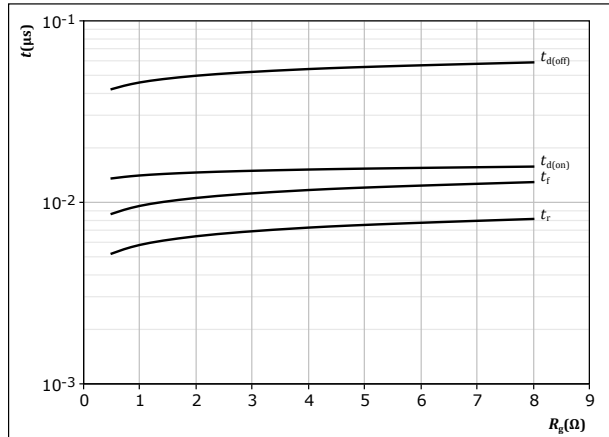
Typical switching times as a function of drain current  
 $t = f(I_D)$



With an inductive load at  
 $T_j = 150 \text{ }^\circ\text{C}$   
 $V_{DS} = 600 \text{ V}$   
 $V_{GS} = -5/15 \text{ V}$   
 $R_{gon} = 2 \text{ } \Omega$   
 $R_{goff} = 2 \text{ } \Omega$

**figure 19.** MOSFET

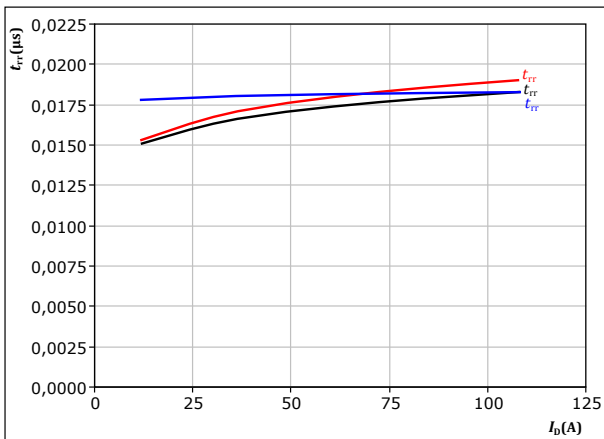
Typical switching times as a function of gate resistor  
 $t = f(R_g)$



With an inductive load at  
 $T_j = 150 \text{ }^\circ\text{C}$   
 $V_{DS} = 600 \text{ V}$   
 $V_{GS} = -5/15 \text{ V}$   
 $I_D = 60 \text{ A}$

**figure 20.** MOSFET

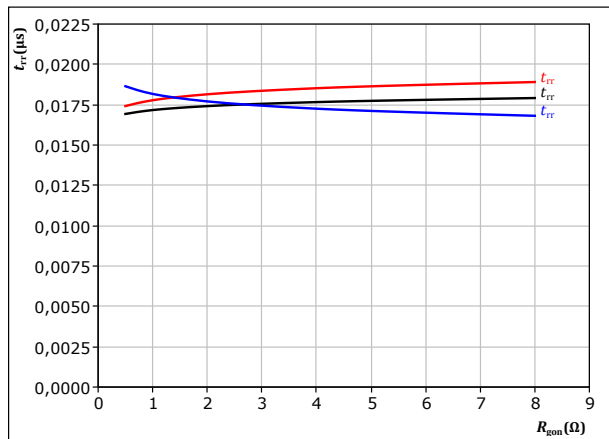
Typical reverse recovery time as a function of drain current  
 $t_{rr} = f(I_D)$



At  $V_{DS} = 600 \text{ V}$   
 $V_{GS} = -5/15 \text{ V}$   
 $R_{gon} = 2 \text{ } \Omega$   
 $T_j$ : — 25 °C  
— 125 °C  
— 150 °C

**figure 21.** MOSFET

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



At  $V_{DS} = 600 \text{ V}$   
 $V_{GS} = -5/15 \text{ V}$   
 $I_D = 60 \text{ A}$   
 $T_j$ : — 25 °C  
— 125 °C  
— 150 °C

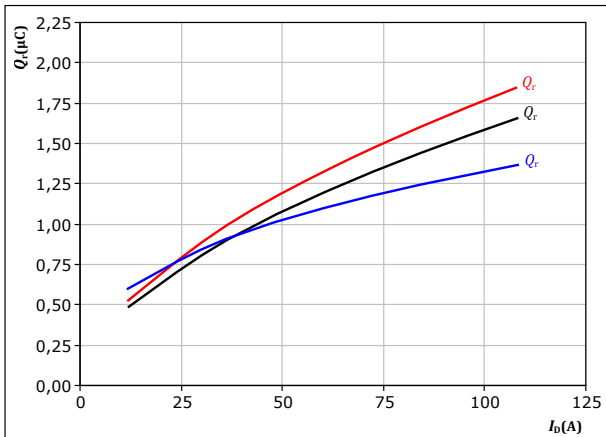


## H-Bridge Switching Characteristics - Lo side

figure 22. MOSFET

Typical recovered charge as a function of drain current

$$Q_r = f(I_D)$$



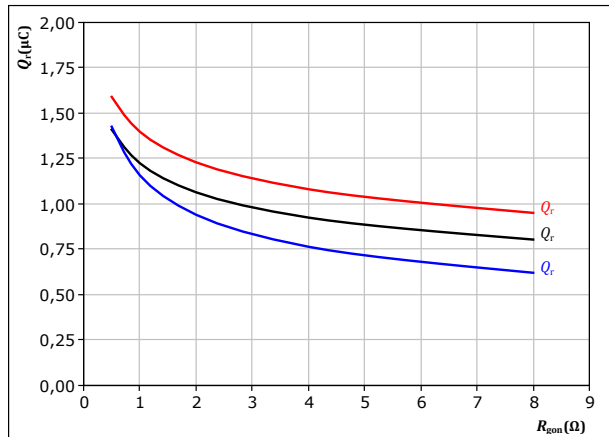
At  $V_{DS} = 600$  V  
 $V_{GS} = -5/15$  V  
 $R_{gson} = 2$   $\Omega$

$T_j$ : 25 °C (blue), 125 °C (black), 150 °C (red)

figure 23. MOSFET

Typical recovered charge as a function of turn on gate resistor

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



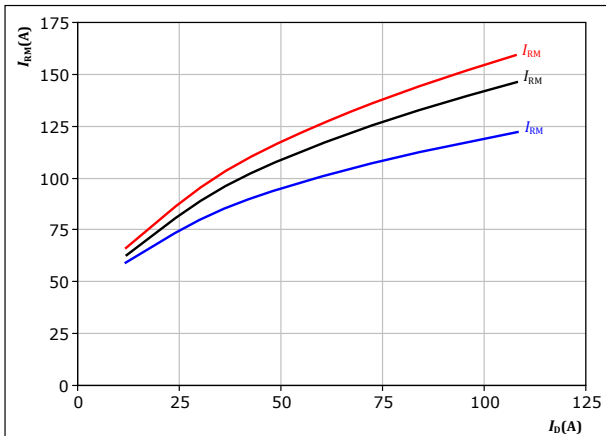
At  $V_{DS} = 600$  V  
 $V_{GS} = -5/15$  V  
 $I_D = 60$  A

$T_j$ : 25 °C (blue), 125 °C (black), 150 °C (red)

figure 24. MOSFET

Typical peak reverse recovery current as a function of drain current

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



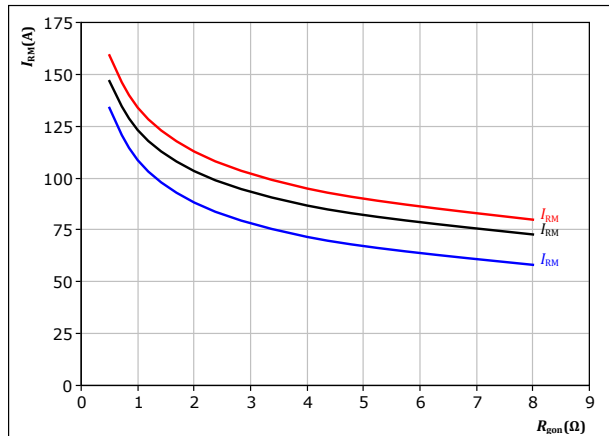
At  $V_{DS} = 600$  V  
 $V_{GS} = -5/15$  V  
 $R_{gson} = 2$   $\Omega$

$T_j$ : 25 °C (blue), 125 °C (black), 150 °C (red)

figure 25. MOSFET

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

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



At  $V_{DS} = 600$  V  
 $V_{GS} = -5/15$  V  
 $I_D = 60$  A

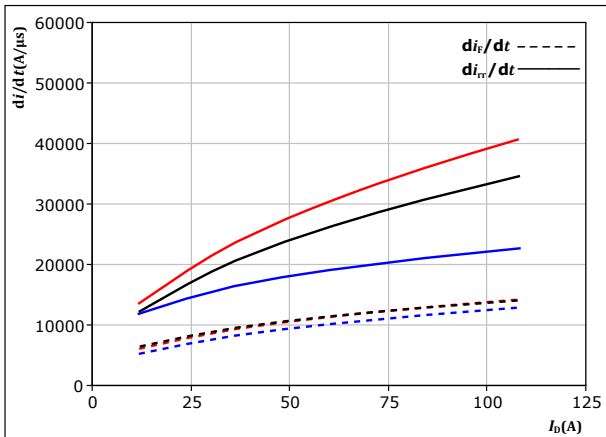
$T_j$ : 25 °C (blue), 125 °C (black), 150 °C (red)



## H-Bridge Switching Characteristics - Lo side

**figure 26.** MOSFET

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

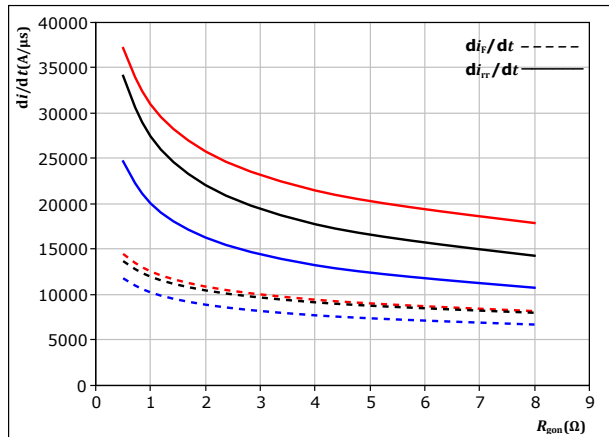


At  $V_{DS} = 600$  V  
 $V_{GS} = -5/15$  V  
 $R_{g(on)} = 2$   $\Omega$

$T_j$ : 25 °C (blue), 125 °C (black), 150 °C (red)

**figure 27.** MOSFET

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



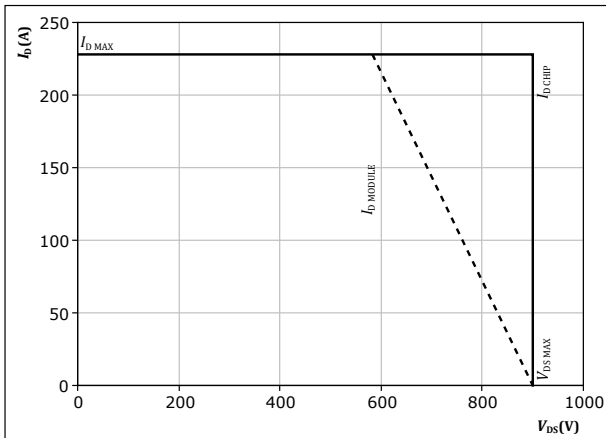
At  $V_{DS} = 600$  V  
 $V_{GS} = -5/15$  V  
 $I_D = 60$  A

$T_j$ : 25 °C (blue), 125 °C (black), 150 °C (red)

**figure 28.** MOSFET

Reverse bias safe operating area

$I_D = f(V_{DS})$



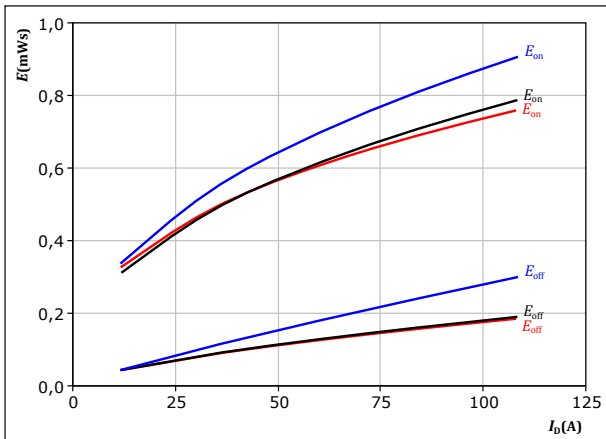
At  $T_j = 150$  °C  
 $R_{g(on)} = 2$   $\Omega$   
 $R_{g(off)} = 2$   $\Omega$



## H-Bridge Switching Characteristics - Hi side

figure 29. MOSFET

Typical switching energy losses as a function of drain current  
 $E = f(I_D)$



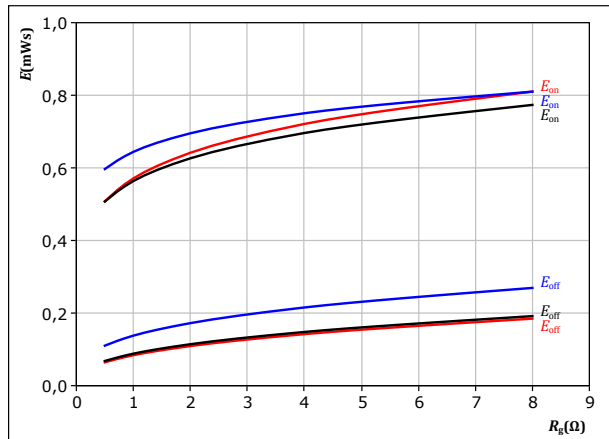
With an inductive load at

$V_{DS} = 600 \text{ V}$   
 $V_{GS} = -5/15 \text{ V}$   
 $R_{gon} = 2 \ \Omega$   
 $R_{goff} = 2 \ \Omega$

$T_j$ : — 25 °C  
 — 125 °C  
 — 150 °C

figure 30. MOSFET

Typical switching energy losses as a function of gate resistor  
 $E = f(R_g)$



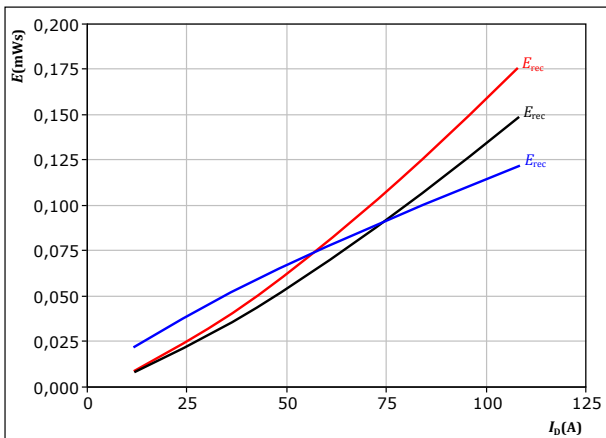
With an inductive load at

$V_{DS} = 600 \text{ V}$   
 $V_{GS} = -5/15 \text{ V}$   
 $I_D = 60 \text{ A}$

$T_j$ : — 25 °C  
 — 125 °C  
 — 150 °C

figure 31. MOSFET

Typical reverse recovered energy loss as a function of drain current  
 $E_{rec} = f(I_D)$



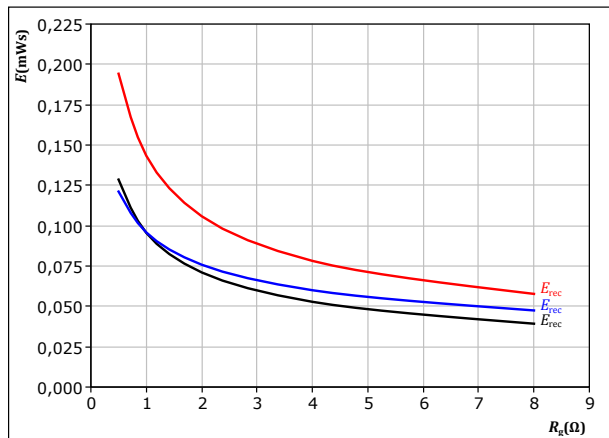
With an inductive load at

$V_{DS} = 600 \text{ V}$   
 $V_{GS} = -5/15 \text{ V}$   
 $R_{gon} = 2 \ \Omega$

$T_j$ : — 25 °C  
 — 125 °C  
 — 150 °C

figure 32. MOSFET

Typical reverse recovered energy loss as a function of gate resistor  
 $E_{rec} = f(R_g)$



With an inductive load at

$V_{DS} = 600 \text{ V}$   
 $V_{GS} = -5/15 \text{ V}$   
 $I_D = 60 \text{ A}$

$T_j$ : — 25 °C  
 — 125 °C  
 — 150 °C

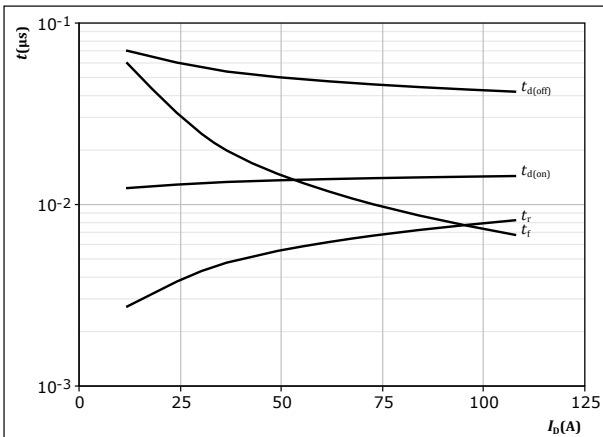




## H-Bridge Switching Characteristics - Hi side

figure 33. MOSFET

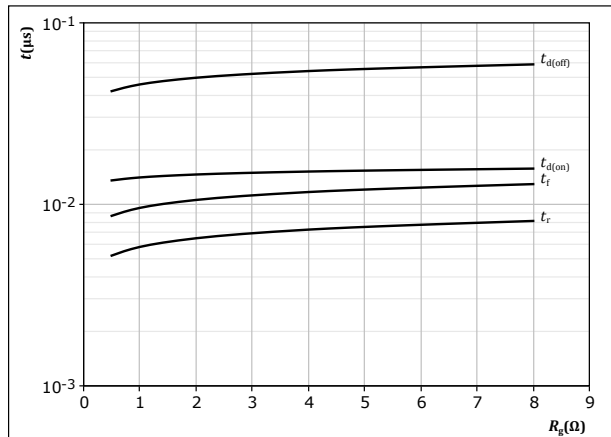
Typical switching times as a function of drain current  
 $t = f(I_D)$



With an inductive load at  
 $T_j = 150 \text{ }^\circ\text{C}$   
 $V_{DS} = 600 \text{ V}$   
 $V_{GS} = -5/15 \text{ V}$   
 $R_{gon} = 2 \text{ } \Omega$   
 $R_{goff} = 2 \text{ } \Omega$

figure 34. MOSFET

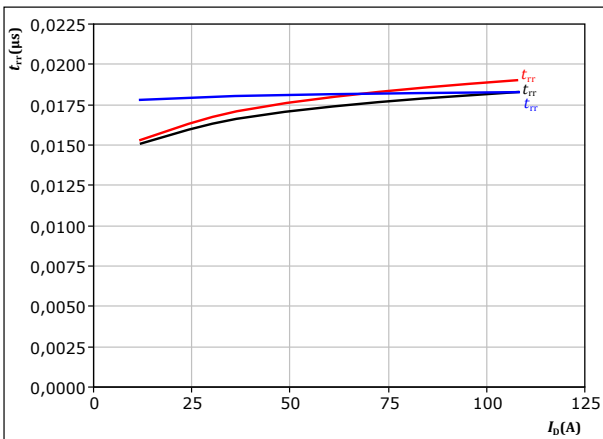
Typical switching times as a function of gate resistor  
 $t = f(R_g)$



With an inductive load at  
 $T_j = 150 \text{ }^\circ\text{C}$   
 $V_{DS} = 600 \text{ V}$   
 $V_{GS} = -5/15 \text{ V}$   
 $I_D = 60 \text{ A}$

figure 35. MOSFET

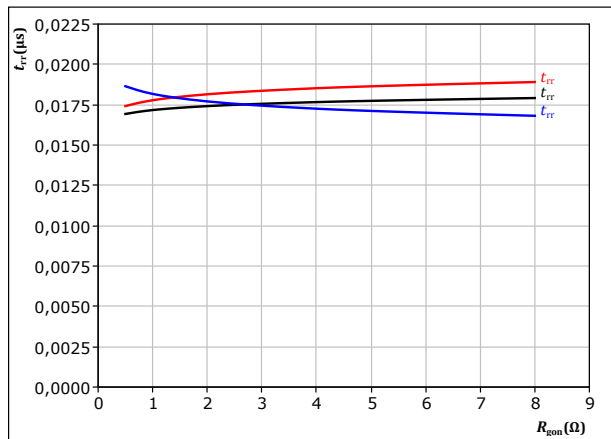
Typical reverse recovery time as a function of drain current  
 $t_{rr} = f(I_D)$



At  $V_{DS} = 600 \text{ V}$   
 $V_{GS} = -5/15 \text{ V}$   
 $R_{gon} = 2 \text{ } \Omega$   
 $T_j: 25 \text{ }^\circ\text{C}$   
 $125 \text{ }^\circ\text{C}$   
 $150 \text{ }^\circ\text{C}$

figure 36. MOSFET

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



At  $V_{DS} = 600 \text{ V}$   
 $V_{GS} = -5/15 \text{ V}$   
 $I_D = 60 \text{ A}$   
 $T_j: 25 \text{ }^\circ\text{C}$   
 $125 \text{ }^\circ\text{C}$   
 $150 \text{ }^\circ\text{C}$

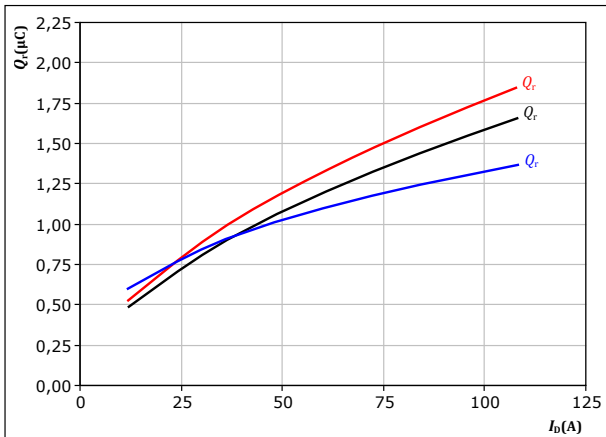


## H-Bridge Switching Characteristics - Hi side

**figure 37.** MOSFET

Typical recovered charge as a function of drain current

$$Q_r = f(I_D)$$



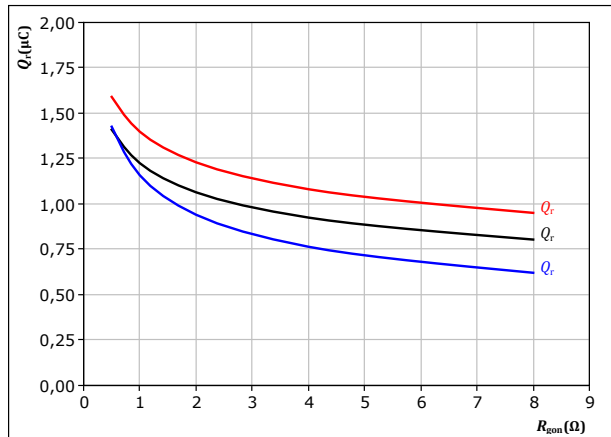
At  $V_{DS} = 600$  V  
 $V_{GS} = -5/15$  V  
 $R_{gson} = 2$   $\Omega$

$T_j$ : 25 °C (blue), 125 °C (black), 150 °C (red)

**figure 38.** MOSFET

Typical recovered charge as a function of turn on gate resistor

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



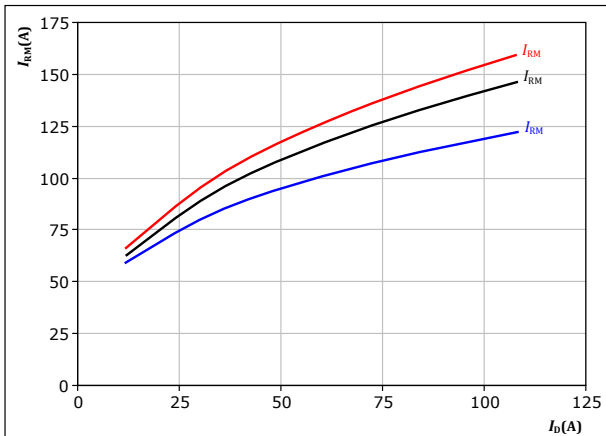
At  $V_{DS} = 600$  V  
 $V_{GS} = -5/15$  V  
 $I_D = 60$  A

$T_j$ : 25 °C (blue), 125 °C (black), 150 °C (red)

**figure 39.** MOSFET

Typical peak reverse recovery current as a function of drain current

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



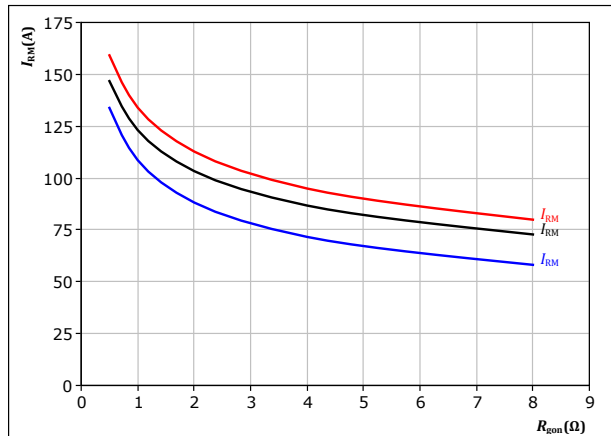
At  $V_{DS} = 600$  V  
 $V_{GS} = -5/15$  V  
 $R_{gson} = 2$   $\Omega$

$T_j$ : 25 °C (blue), 125 °C (black), 150 °C (red)

**figure 40.** MOSFET

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

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



At  $V_{DS} = 600$  V  
 $V_{GS} = -5/15$  V  
 $I_D = 60$  A

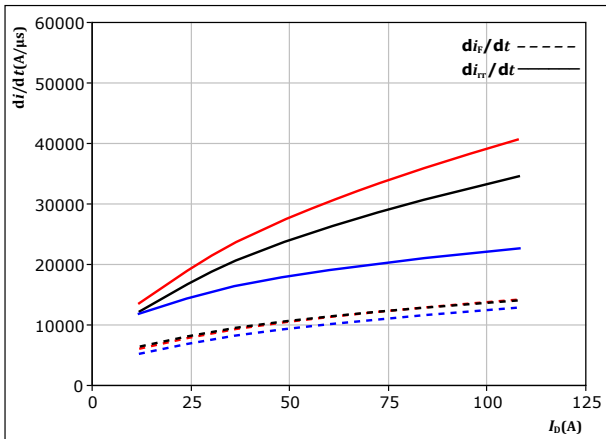
$T_j$ : 25 °C (blue), 125 °C (black), 150 °C (red)



## H-Bridge Switching Characteristics - Hi side

**figure 41.** MOSFET

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

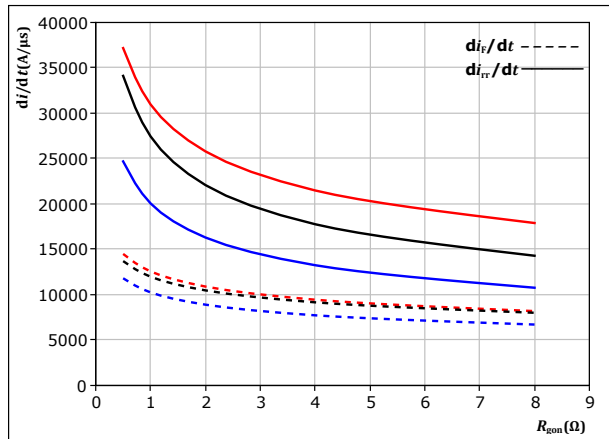


At  $V_{DS} = 600$  V  
 $V_{GS} = -5/15$  V  
 $R_{g(on)} = 2$  Ω

$T_j$ : 25 °C (blue), 125 °C (black), 150 °C (red)

**figure 42.** MOSFET

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



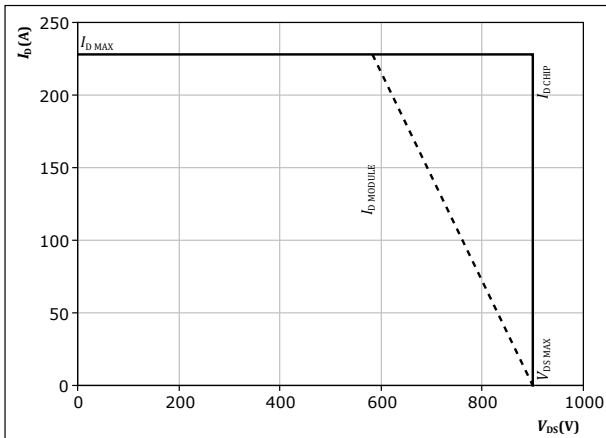
At  $V_{DS} = 600$  V  
 $V_{GS} = -5/15$  V  
 $I_D = 60$  A

$T_j$ : 25 °C (blue), 125 °C (black), 150 °C (red)

**figure 43.** MOSFET

Reverse bias safe operating area

$I_D = f(V_{DS})$



At  $T_j = 150$  °C  
 $R_{g(on)} = 2$  Ω  
 $R_{g(off)} = 2$  Ω



## Switching Definitions

figure 44. MOSFET

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

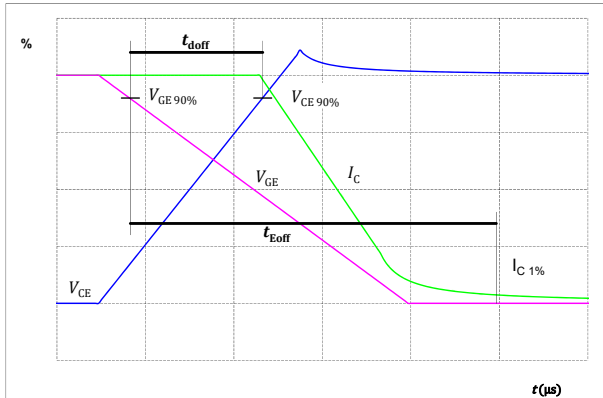


figure 45. MOSFET

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

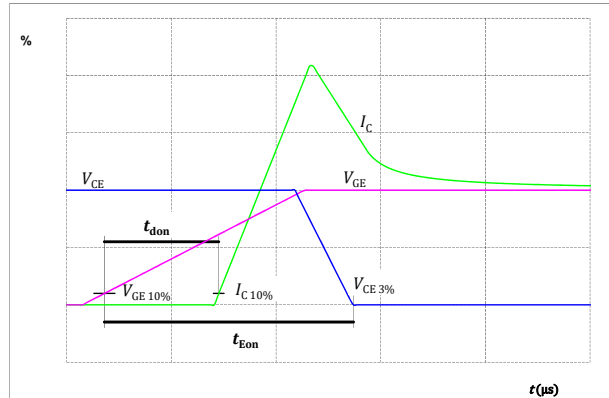


figure 46. MOSFET

Turn-off Switching Waveforms & definition of  $t_f$

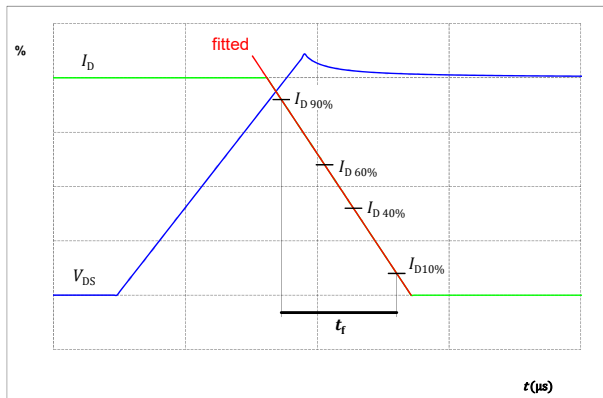
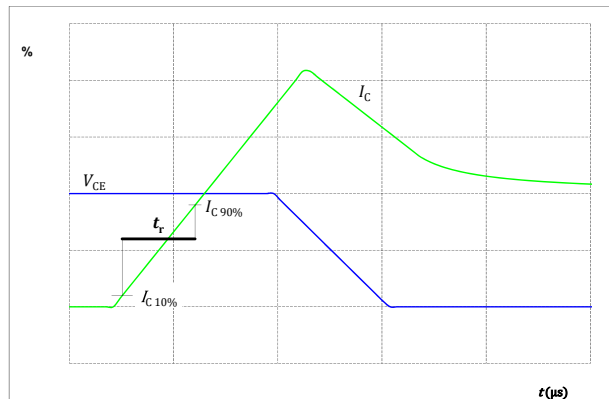


figure 47. MOSFET

Turn-on Switching Waveforms & definition of  $t_r$





## Switching Definitions

figure 48. FWD

Turn-off Switching Waveforms & definition of  $t_{tr}$

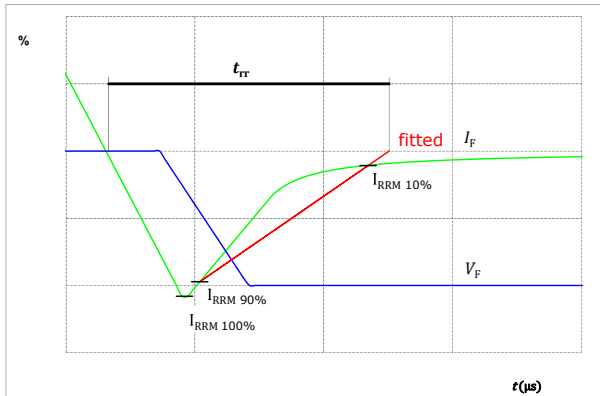


figure 49. FWD

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

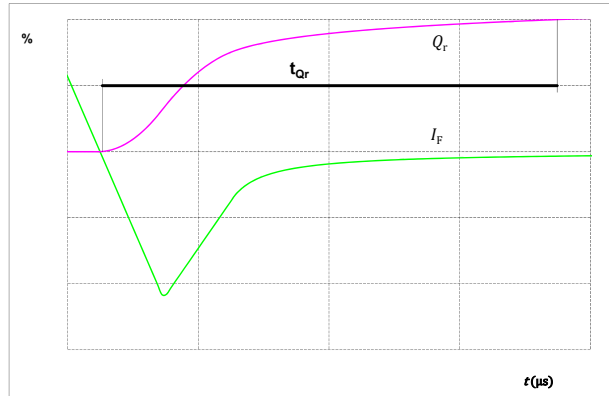
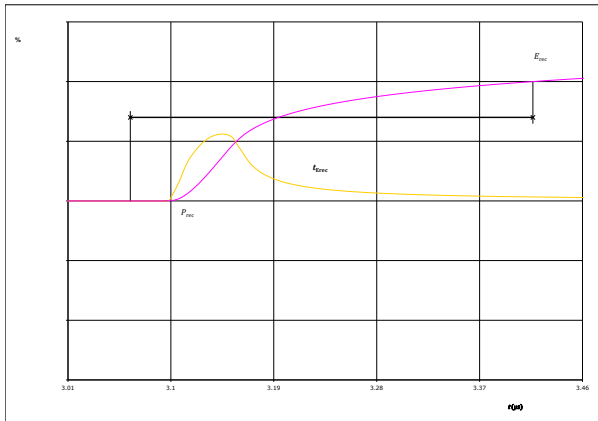


figure 50. FWD


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

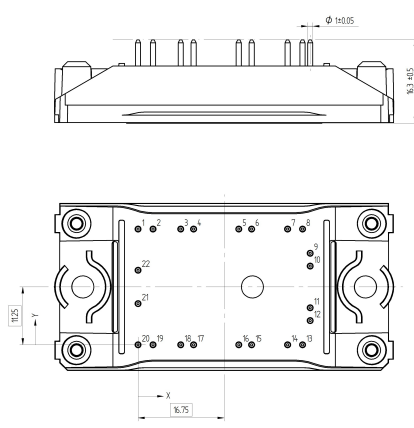




Vincotech

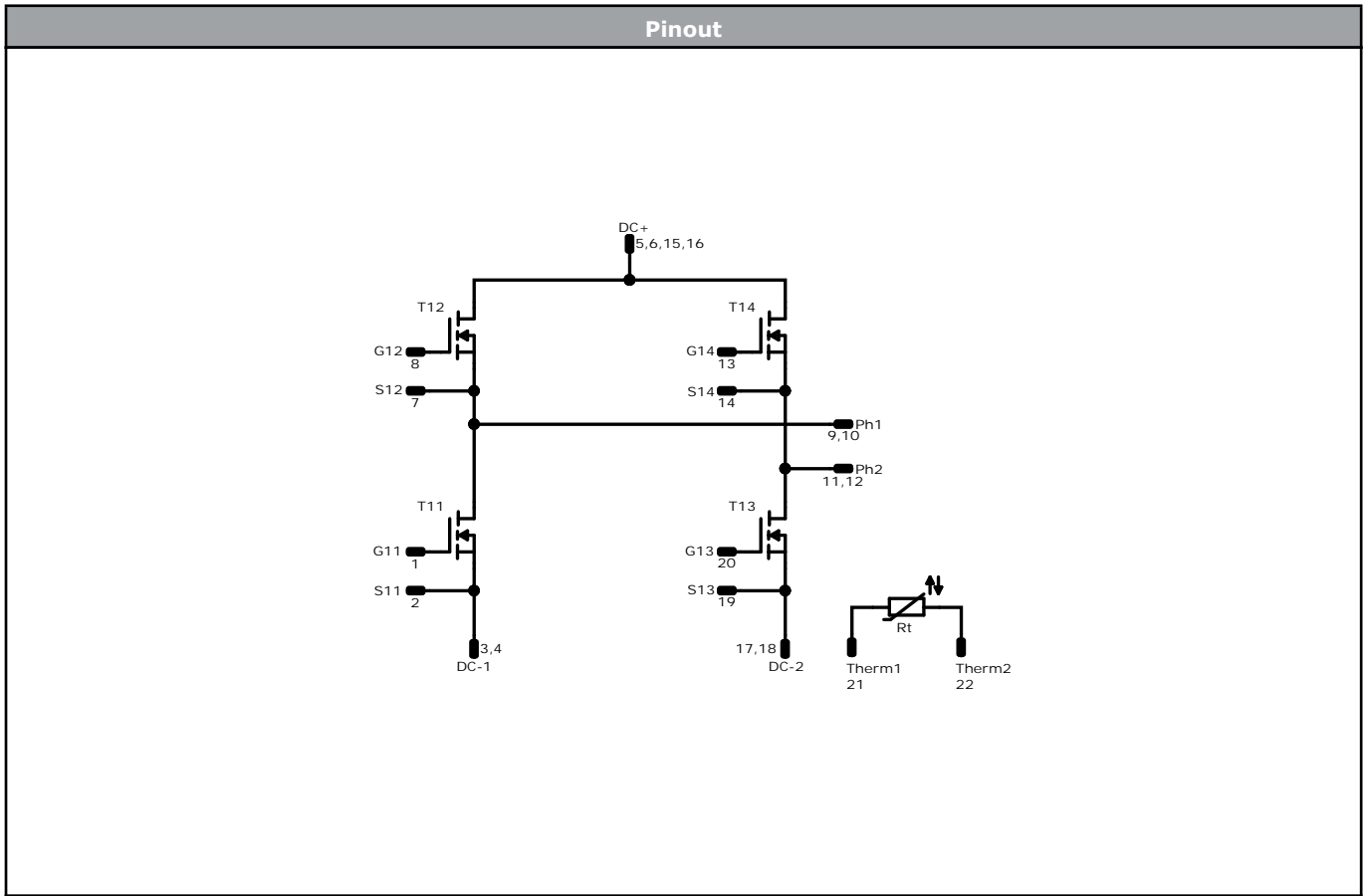
Ordering Code	
<b>Version</b>	<b>Ordering Code</b>
Without thermal paste	10-FU094PB017ME05-L620F31
With thermal paste	10-FU094PB017ME05-L620F31-/3/

Marking						
	<b>Text</b>	<b>Name</b> NN-NNNNNNNNNNNNNN- TTTTTV	<b>Date code</b> WWYY	<b>UL &amp; VIN</b> UL VIN	<b>Lot</b> LLLLL	<b>Serial</b> SSSS
	<b>Datamatrix</b>	<b>Type&amp;Ver</b> TTTTTTTV	<b>Lot number</b> LLLLL	<b>Serial</b> SSSS	<b>Date code</b> WWYY	

Pin table [mm]				Outline	
Pin	X	Y	Function	 <p style="font-size: small;">Tolerance of proportions: ±0.05mm at the end of pins Dimension of concrete pins is only official without tolerance</p>	
1	0	22,5	G11		
2	2,9	22,5	S11		
3	8,3	22,5	DC-1		
4	10,8	22,5	DC-1		
5	19,6	22,5	DC+		
6	22,1	22,5	DC+		
7	29,1	22,5	S12		
8	32	22,5	G12		
9	33,5	17,8	Ph1		
10	33,5	15,3	Ph1		
11	33,5	7,2	Ph2		
12	33,5	4,7	Ph2		
13	32	0	G14		
14	29,1	0	S14		
15	22,1	0	DC+		
16	19,6	0	DC+		
17	10,8	0	DC-2		
18	8,3	0	DC-2		
19	2,9	0	S13		
20	0	0	G13		
21	0	8	Therm1		
22	0	14,5	Therm2		



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Identification					
ID	Component	Voltage	Current	Function	Comment
T11, T13	MOSFET	900 V	21,67 mΩ	H-Bridge Switch - Lo side	
T12, T14	MOSFET	900 V	21,67 mΩ	H-Bridge Switch - Hi side	
Rt	Thermistor			Thermistor	




Vincotech

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

Handling instruction
Handling instructions for <i>flow 0</i> packages see vincotech.com website.

Package data
Package data for <i>flow 0</i> packages see vincotech.com website.

UL recognition and file number
This device is certified according to UL 1557 standard, UL file number E192116. For more information see vincotech.com website. 

Document No.:	Date:	Modification:	Pages
10-FU094PB017ME05-L620F31-D1-14	19 Jun. 2020		

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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.