VFPB010R850MA

Datasheet

85mΩ, 100V, N-Channel Power MOSFET VFPB010R850MA

General Description

$V_{(BR)DSS}$	$R_{DS(ON)\_max}$	I_D
100V	85mΩ@10V	10A

Symbol

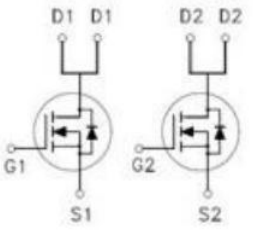
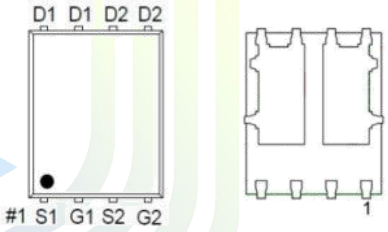


Figure 1 Symbol of VFPB010R850MA

Features

- Split Gate Trench Technology
- Low $R_{DS(ON)}$
- Low Gate Charge
- Low Gate Resistance
- 100% UIS Tested

Package Type



PDFN5X6-8L

Figure 2 Package Type of VFPB010R850MA

Application

- Power Switch Application

Ordering Information

Product Name	Package
VFPB010R850MA	PDFN5X6 -8L

Absolute Maximum Ratings (T_A= 25 ºC, unless otherwise specified)

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DSS}	100	V
Gate-Source Voltage		V_{GSS}	±20	V
Continuous Drain Current[Note1]	T_C= 25 ºC	I_D	10	A
Continuous Drain Current[Note1]	T_C= 100 ºC		7	
Pulsed Drain Current [Note2]		I_{DM}	40	
Total Power Dissipation[Note4]	T_C= 25 ºC	P_D	7.4	W
Junction Temperature		T_J	150	ºC
Storage Temperature		T_{STG}	-55 to 150	ºC

Thermal Resistance

Parameter	Symbol	Min	Typ	Max	Unit
Thermal Resistance, Junction-to-Ambient [Note5]	$R_{\theta JA}$		66		ºC/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$		17		ºC/W

Electrical Characteristics (T_J= 25 ºC, unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Statistic Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D= 250uA	100			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}= 100V, V_{GS}=0V			1	uA
Gate-Body Leakage Current	I_{GSS}	V_{GS} =±20V, V_{DS}= 0V			±500	nA
Gate Threshold Voltage[Note3]	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250uA	1.0	1.7	3.0	V
Static Drain-Source On-Resistance[Note3]	$R_{DS(ON)}$	V_{GS}=10V, I_D= 5A		70	85	mΩ
Forward Transconductance[Note3]	g_{FS}	V_{DS}=5V, I_D= 5A		14		S
Dynamic Characteristics						
Input Capacitance	C_{ISS}	V_{DS}=50V		221		pF
Output Capacitance	C_{OSS}	V_{GS}=0V		78		pF
Reverse Transfer Capacitance	C_{RSS}	f=1MHz		4.4		pF
Total Gate Charge	Q_g	V_{DS}=50V		3		nC
Gate-Source Charge	Q_{gs}	V_{GS}=10V		0.9		
Gate-Drain Charge	Q_{gd}	I_D= 5A		1		
Gate Resistance	Rg	f = 1MHz, Open drain		2.5		Ω
Switching Parameters						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}= 50V		5		ns
Turn-on Rise Time	t_r	V_{GS}= 10V		3		
Turn-off Delay Time	$t_{d(off)}$	R_L=10Ω		15		
Turn-off Fall Time	t_f	R_G=3Ω		4		
Diode Characteristics						
Diode Forward Voltage [Note3]	V_{SD}	V_{GS}=0V, I_S= 10A			1.2	V
Diode Reverse Recovery Time	t_{rr}	I_F = 5A, dI/dt = 500A/ms		15		ns
Diode Reverse Recovery Charge	Q_{rr}	I_F = 5A, dI/dt = 500A/ms		44		nC

Notes :

1.The maximum current rating is limited by package.And device mounted on a large heatsink.

2.Pulse Test : Pulse Width ≤ 10μs, duty cycle ≤ 1%.

3.Pulse Test : Pulse Width ≤ 300μs, duty cycle ≤ 2%.

4.The power dissipation P_D is limited by $T_{J(MAX)}$ = 150°C.And device mounted on a large heatsink

5.Device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25°C.

Typical Performance Characteristics

Figure 3: Transfer Characteristics

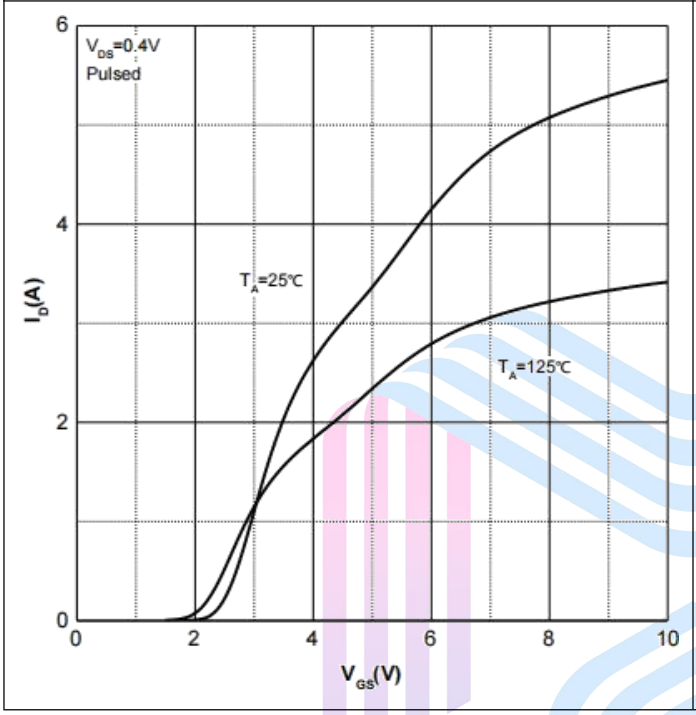


Figure 4: Output Characteristics

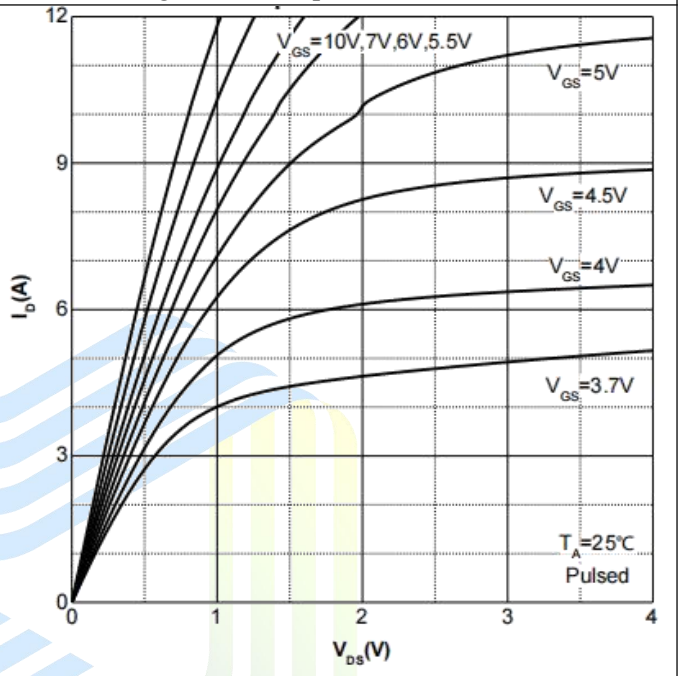


Figure 5: On-Resistance vs. Drain Current

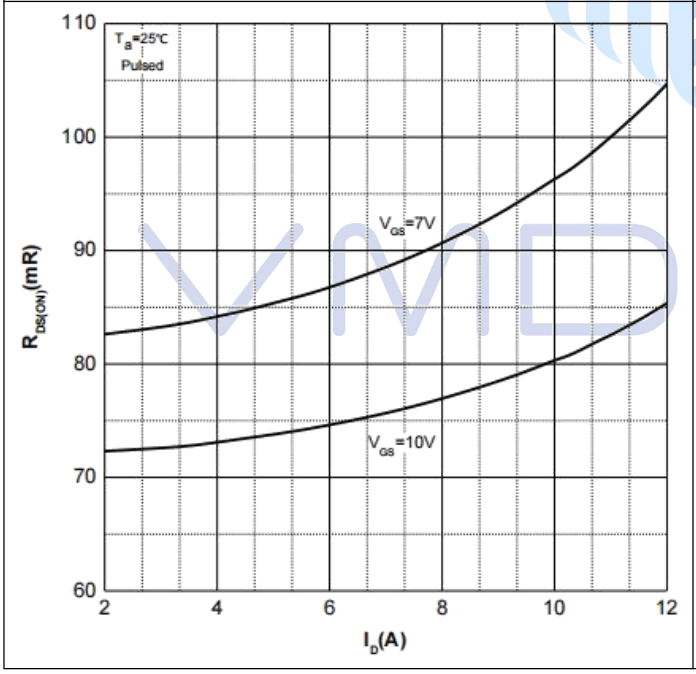


Figure 6: On-Resistance vs. Gate Voltage

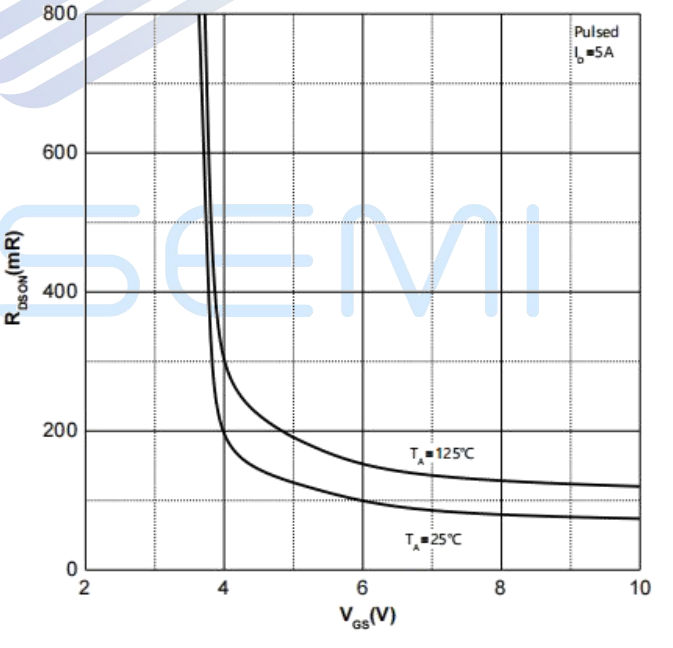


Figure 7: Body Diode Characteristics

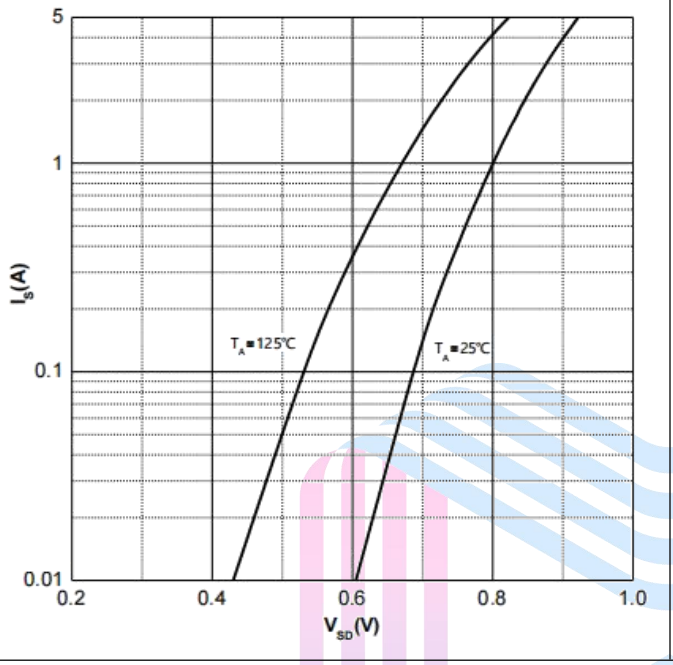
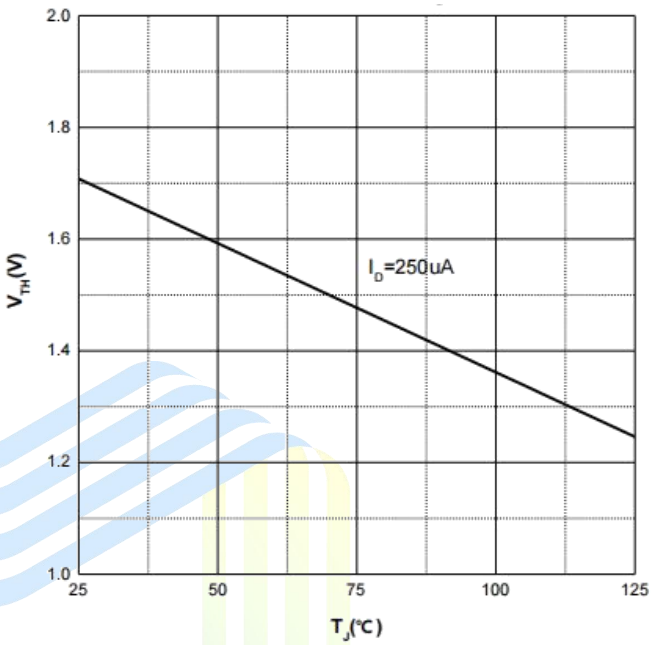
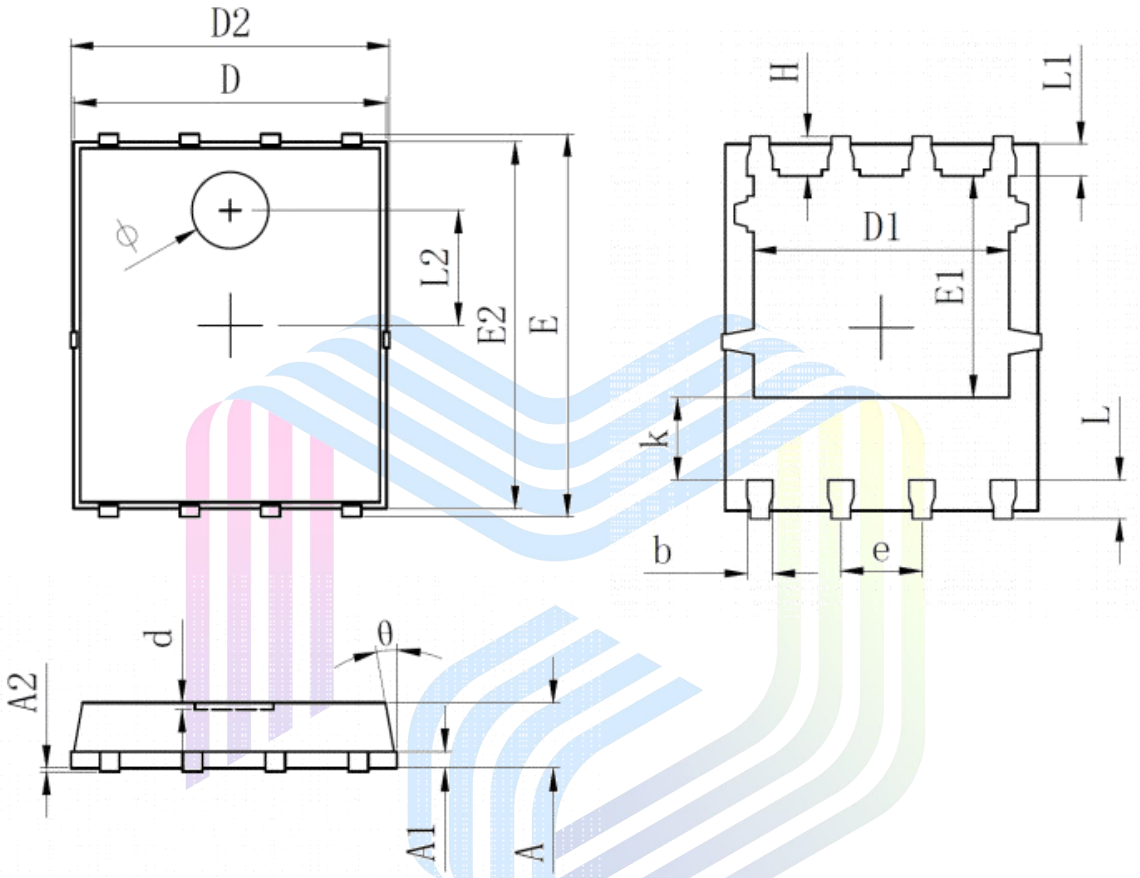


Figure 8: Threshold Voltage



Mechanical Dimensions:

PDFN5X6 _8L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.100	0.035	0.043
A1	0.254REF		0.010REF	
A2	0.000	0.050	0.000	0.002
D	4.824	4.976	0.190	0.196
D1	3.910	4.110	0.154	0.162
D2	4.924	5.076	0.194	0.200
E	5.924	6.076	0.233	0.239
E1	3.375	3.575	0.133	0.141
E2	5.674	5.826	0.223	0.229
b	0.350	0.450	0.014	0.018
e	1.270TYP		0.050TYP	
L	0.534	0.686	0.021	0.027
L1	0.424	0.576	0.017	0.023
k	1.190	1.390	0.047	0.055
H	0.549	0.701	0.022	0.028
θ	8°	12°	8°	12°
Φ	1.100	1.300	0.043	0.051
d	-	0.100	-	0.004

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