



VMDSEMI

VFPB006R110NA

Datasheet



VMDSEMI

General Description

$V_{(BR)DSS}$	$R_{DS(ON)_{max}}$	I_D
60V	11mΩ@10V	44A
	17mΩ@4.5V	

Symbol

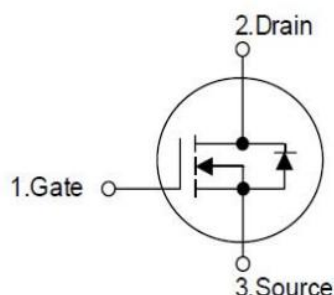


Figure 1 Symbol of VFPB006R110NA

Features

- Low $R_{DS(ON)}$ & FOM
- Extremely low switching loss
- Fast switching and soft recovery
- EMI Improved Design

Application

- BMS
- Switched mode power supply
- DC-DC converter
- Solar inverter
- UPS and energy inverter
- Motor Driver
- Charger / Adapter
- PD

Package Type



Figure 2 Package Type of VFPB006R110NA

Ordering Information

Product Name	Package
VFPB006R110NA	PDFN5X6

11m Ω , 60V, N-Channel Power MOSFET
VFPB006R110NA
Absolute Maximum Ratings ($T_J = 25^\circ\text{C}$, unless otherwise specified)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ^{Note 1} $T_C = 25^\circ\text{C}$	I_D	44	A
Pulsed Drain Current ^{Note 2}	I_{DM}	176	A
Max Power Dissipation ^{Note 3} $T_C = 25^\circ\text{C}$	P_D	66	W
Avalanche Current, Single Pulse ^{Note 5}	I_{AS}	20	A
Avalanche Energy, Single Pulse ^{Note 5}	E_{AS}	171	mJ
Operation Junction temperature	T_J	-55 to 150	$^\circ\text{C}$

Thermal Resistance

Parameter	Symbol	Min	Typ	Max	Unit
Thermal Resistance, Junction-to-Ambient ^{Note 4}	$R_{\theta JA}$		62		$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Lead	$R_{\theta JC}$		1.15		$^\circ\text{C/W}$

Notes:

- 1) Calculated continuous current based on maximum allowable junction temperature.
- 2) Repetitive rating; pulse width limited by max. junction temperature.
- 3) P_D is based on max. junction temperature, using junction-case thermal resistance.
- 4) The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^\circ\text{C}$.
- 5) $V_{DS} = 25\text{ V}$, $V_{GS} = 10\text{ V}$, $L = 0.5\text{ mH}$, starting $T_J = 25^\circ\text{C}$.

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11mΩ, 60V, N-Channel Power MOSFET
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Electrical Characteristics($T_J = 25\text{ }^{\circ}\text{C}$, 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	60			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =60V, V _{GS} =0V			1	uA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V			±100	nA
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250uA	1.2	1.6	2.4	V
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =10A		8.2	11	mΩ
		V _{GS} =4.5V, I _D =8A		10.5	17	mΩ
Gate Resistance	R _G	V _{GS} =0V,V _{DS} =0V,f=1MHz		1.7		Ω
Dynamic Characteristics						
Input Capacitance	C _{ISS}	V _{GS} =0V V _{DS} =30V f=1MHz		1189		pF
Output Capacitance	C _{OSS}			249		pF
Reverse Transfer Capacitance	C _{RSS}			12.7		pF
Turn-on Delay Time	t _{d(on)}	V _{GS} =10 V		4.3		ns
Rise Time	t _r	V _{DD} =30 V		21.6		
Turn-off Delay Time	t _{d(off)}	R _G =3 Ω		23.9		
Fall Time	t _f	I _D =10 A		24.5		
Switching Characteristics						
Total Gate Charge (@V _{GS} =10V)	Q _g	V _{GS} =0 to 10V V _{DS} =30V I _D =10A		18.5		nC
Total Gate Charge (@V _{GS} =4.5V)	Q _g			8.3		
Gate to Source Charge	Q _{gs}			3		
Gate to Drain Charge	Q _{gd}			1.6		
Reverse Diode Characteristics						
Drain-Source Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _{SD} =10A		0.8	1.2	V
Reverse Recovery Time	t _{rr}	V _{GS} =0V		29.4		ns
Reverse Recovery Charge	Q _{rr}	I _{sd} =10A		17.7		nC
Peak Reverse Recovery Current	I _{rrm}	di/dt=100A/us		1.2		A

Typical Performance Characteristics

Figure 3: Typ. Output Characteristics

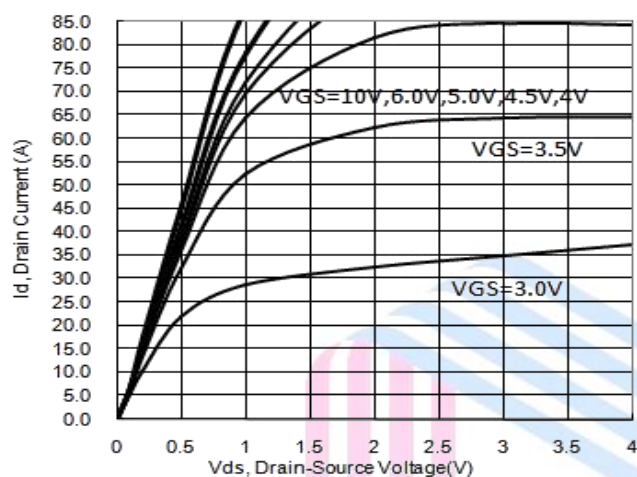


Figure 4: Typ. Transfer Characteristics

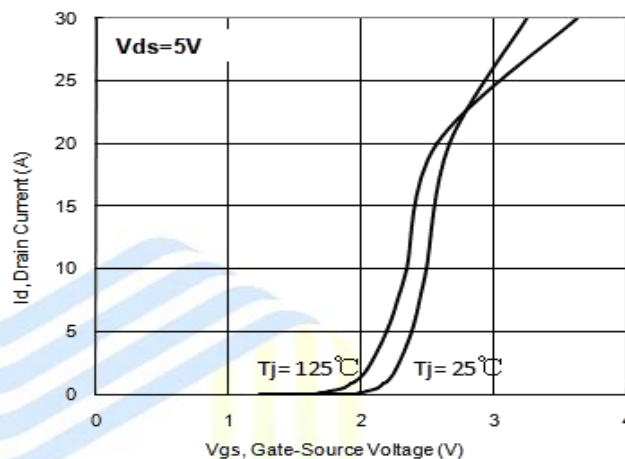


Figure 5: Drain-Source On-State Resistance

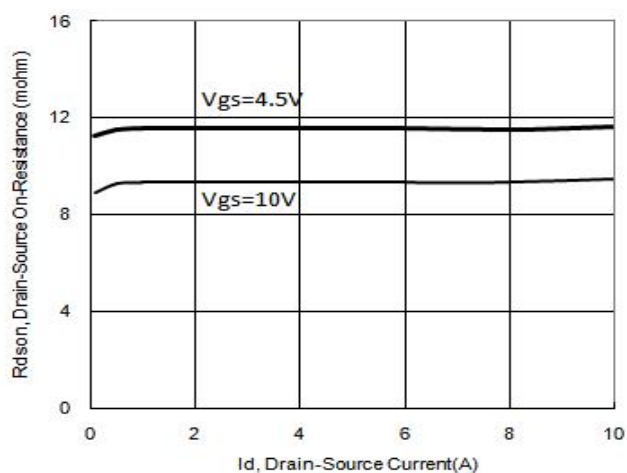
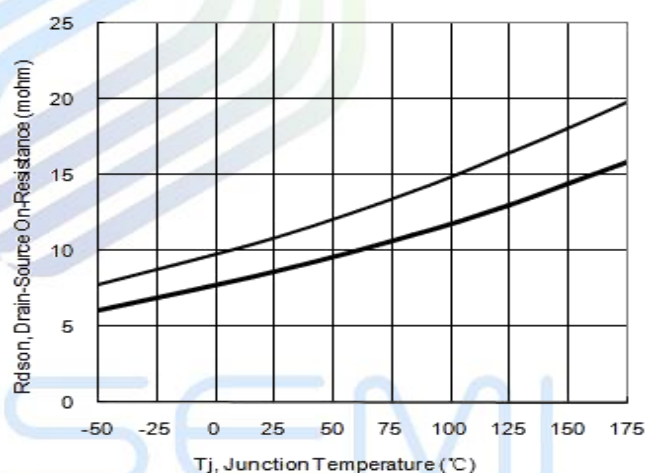


Figure 6: Drain-Source On-State Resistance



11m Ω , 60V, N-Channel Power MOSFET

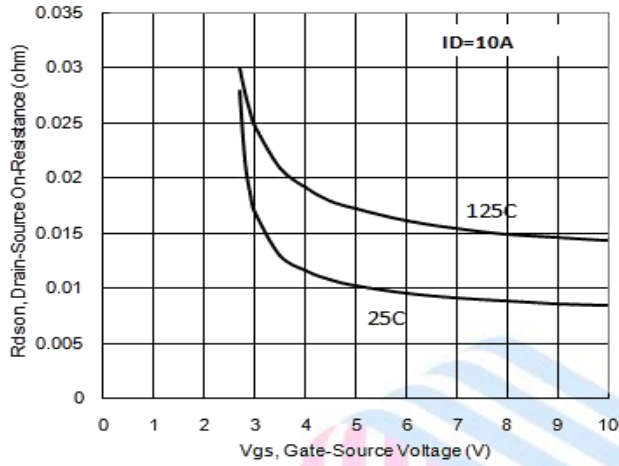
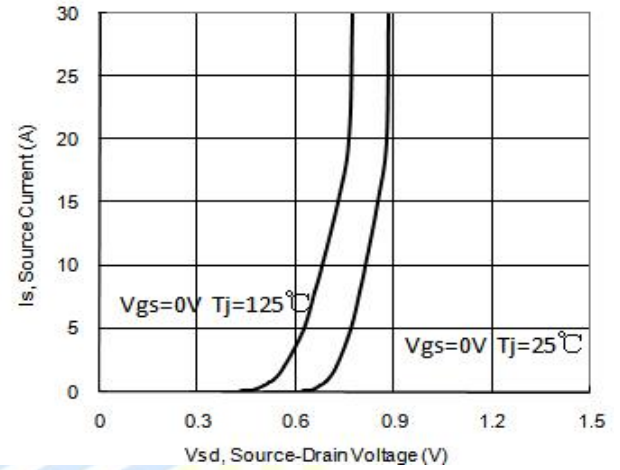
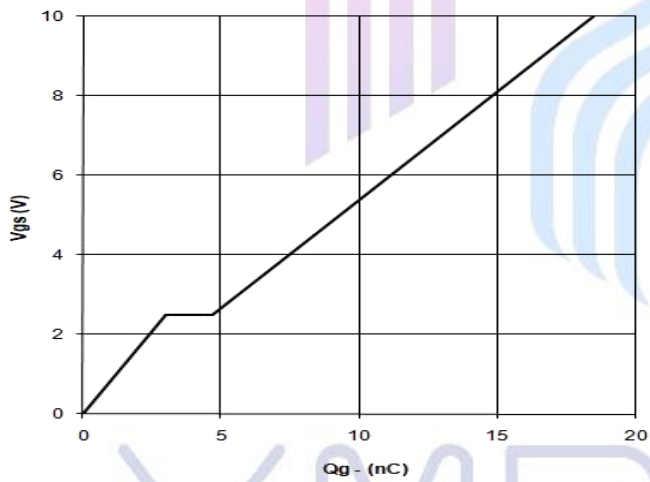
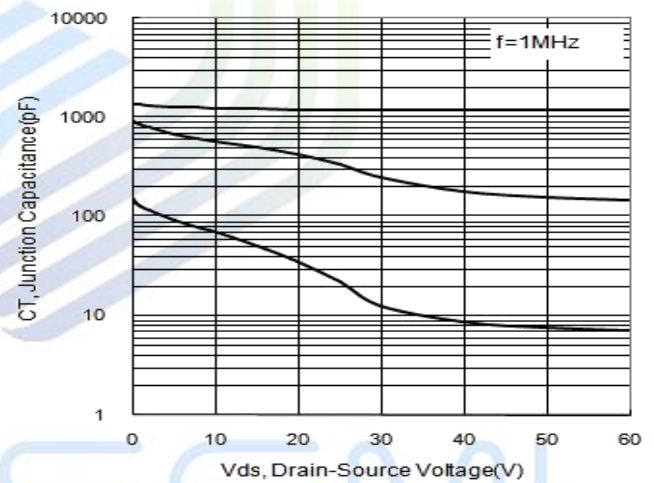
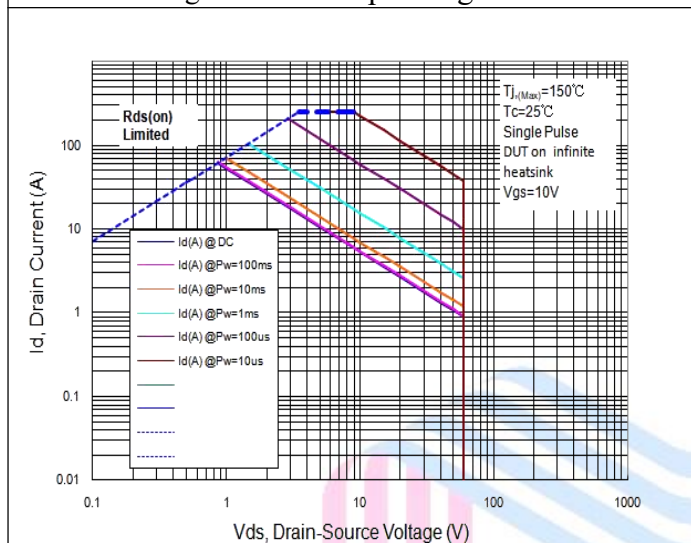
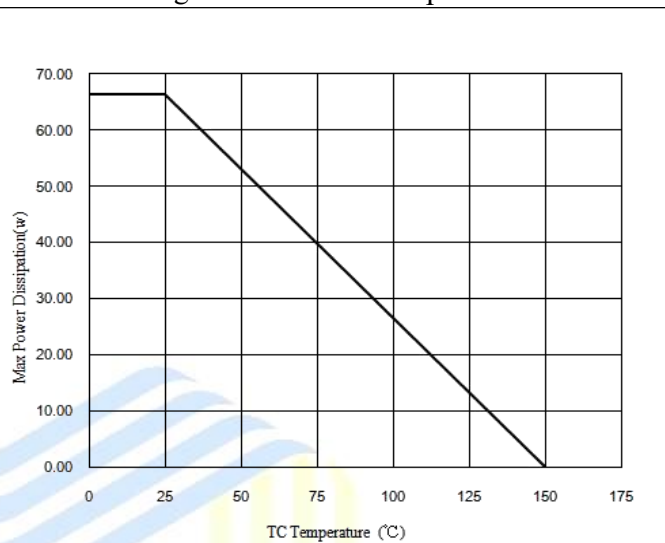
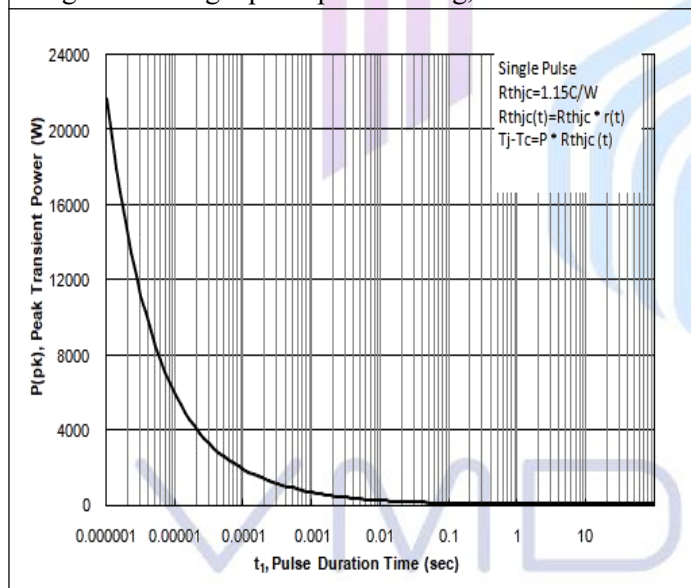
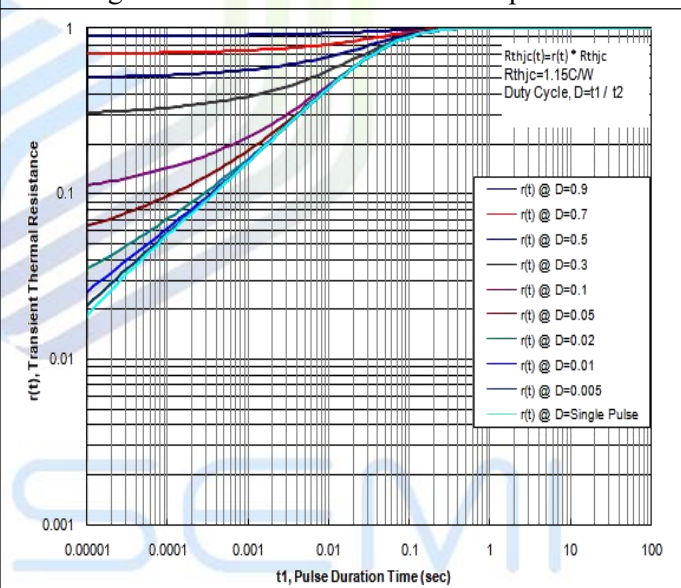
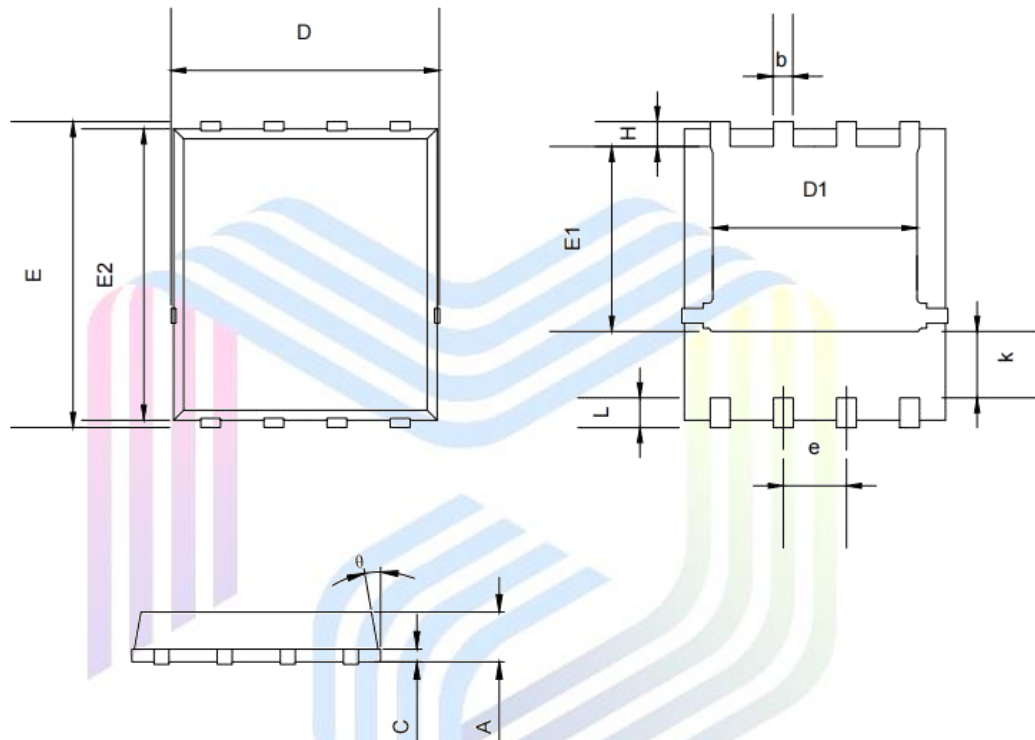
VFPB006R110NA
Figure 7: On-Resistance vs. Gate-source voltage

Figure 8: Forward Characteristics of Body Diode

Figure 9: Gate Charge Characteristics

Figure 10: Typ. Capacitances


Figure11: Safe Operating Area

Figure12: Power Dissipation

Figure 13: Single pulse power rating, Junction to case

Figure 14: Max transient thermal impedance


Mechanical Dimensions

PDFN5*6 Package Information



SYMBOL	MILLIMETERS	
	MIN	MAX
A	0.90	1.20
C	0.15	0.35
D	4.80	5.40
D1	3.61	4.31
E	5.90	6.35
E1	3.30	3.92
E2	5.50	6.06
k	1.10	-
b	0.30	0.51
e	1.27BSC	
L	0.38	0.71
H	0.38	0.71
θ	0°	12°

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