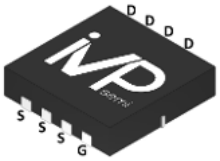
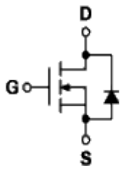
VPLMDF7130

N-Channel Enhancement Mode MOSFET

PDFN3.3*3.3



Symbol



Parameter	Value	Unit
V_{DS}	30	V
$R_{DS(ON)-Max}$	7.4	mΩ
I_D	50	A

Key Features

- Lower $R_{DS(ON)}$ to Minimize Conduction Losses
- Reliable and Rugged
- ROHS Compliant & Halogen-Free
- 100% UIS and Rg Tested

Applications

- Portable Equipment
- Battery Powered System

Ordering Information

Ordering part Number	Marking code	Package	Form
VPLMDF7130	7130	PDFN3.3*3.3	Tape & Reel

Absolute Maximum Ratings (T_J = 25°C, unless otherwise specified)

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	±20	V
Maximum Junction Temperature		T_J	150	°C
Storage Temperature Range		T_{STG}	-55 to 150	°C
Pulse Drain Current Tested	T_c=25°C	I_{DM}(1)	71	A
Continuous Drain Current	T_c=25°C	I_D	50	A
	T_c=100°C		32	
Maximum Power Dissipation	T_c=25°C	P_D	30	W
	T_c=100°C		12	
Avalanche Current, Single pulse	L=0.1mH	I_{AS}(2)	21	A
Avalanche Energy, Single pulse	L=0.1mH	E_{AS}(2)	22	mJ

Thermal Characteristics

Parameter		Symbol	Rating	Unit
Thermal Resistance-Junction to Case	Steady State	$R_{\theta JC}$	4.2	°C/W
Thermal Resistance-Junction to Ambient	Steady State	$R_{\theta JA}$(3)	95	°C/W

- (1) Max. current is limited by bonding wire
- (2) UIS tested and pulse width are limited by maximum junction temperature 150°C
- (3) Surface Mounted on 1in² FR-4 board with 1oz.

Electrical Characteristics (T_J = 25°C, unless otherwise specified)

Static Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	30	-	-	V	V_{GS}=0V, I_{DS}=250uA
Zero Gate Voltage Drain Current	I_{DSS}	-	-	1	uA	V_{DS}=24V, V_{GS}=0V
Gate Threshold Voltage	$V_{GS(th)}$	1.1	1.6	2.1	V	V_{DS}=V_{GS}, I_{DS}=250uA
Gate Leakage Current	I_{GSS}	-	-	±100	nA	V_{GS}=±20V, V_{DS}=0V
Drain-Source On-state Resistance	$R_{DS(ON)}$ (4)	-	6.2	7.4	mΩ	V_{GS}=10V, I_{DS}=8A
		-	8.2	10.7		V_{GS}=4.5V, I_{DS}=6A
Forward Transconductance	g_{fs}	-	12	-	S	V_{DS}=5V, I_{DS}=8A

Dynamic Characteristics(5)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Gate Resistance	R_G	-	3.5	-	Ω	V_{GS}=0V,V_{DS}=0V, Freq.=1MHz
Input Capacitance	C_{iss}	-	1094	-	pF	V_{GS}=0V, V_{DS}=15V, Freq.=1MHz
Output Capacitance	C_{oss}	-	147	-		
Reverse Transfer Capacitance	C_{rss}	-	127	-		
Turn-on Delay Time	$t_{d(ON)}$	-	6	-	nS	V_{GS}=10V,V_{DS}=15V, I_D=1A,R_{GEN}=6Ω
Turn-on Rise Time	t_r	-	22.5	-		
Turn-off Delay Time	$t_{d(OFF)}$	-	48.6	-		
Turn-off Fall Time	t_f	-	19.8	-		

Gate Charge Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Total Gate Charge	Q_g	-	16	-	nC	V_{GS}=4.5V,V_{DS}=25V I_D=8A
		-	31	-		V_{GS}=10V,V_{DS}=25V, I_D=8A
Gate-Source Charge	Q_{gs}	-	1.4	-		
Gate-Drain Charge	Q_{gd}	-	9.3	-		

Source Drain Diode Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Diode Forward Voltage	V_{SD} (4)	-	0.7	1.1	V	I_{SD}=1A, V_{GS}=0V
Reverse Recovery Time	t_{rr}	-	14	-	nS	I_F=1A, V_R=0V & dI_F/dt=100A/μs
Reverse Recovery Charge	Q_{rr}	-	5.6	-	nC	

- (4) Pulse test (pulse width ≤ 300us, duty cycle ≤ 2%).
- (5) Guaranteed by design, not subject to production test

Electrical characteristics diagrams

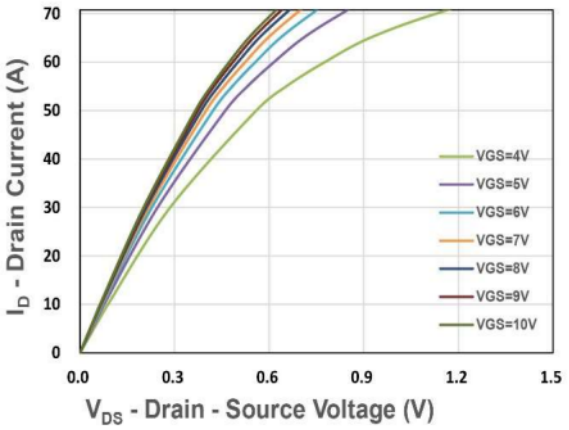


Figure 1. Output Characteristics

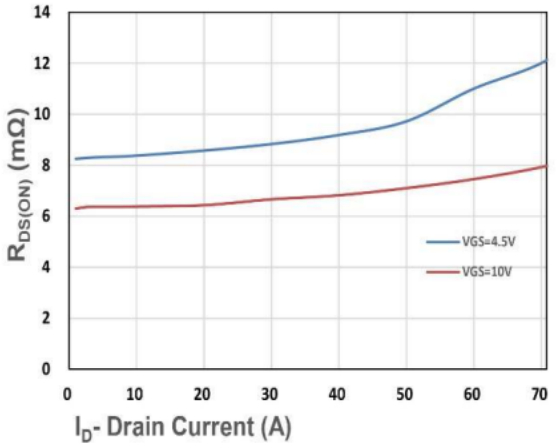


Figure 2. On-Resistance vs. ID

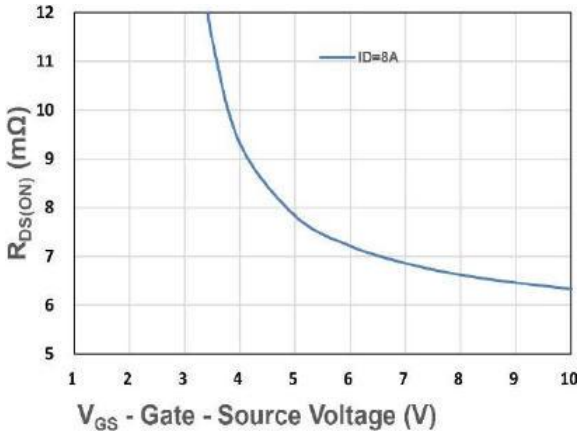


Figure 3. On-Resistance vs. VGS

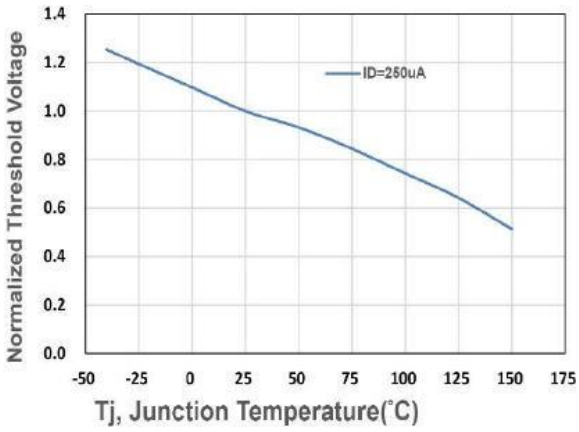


Figure 4. Gate Threshold Voltage

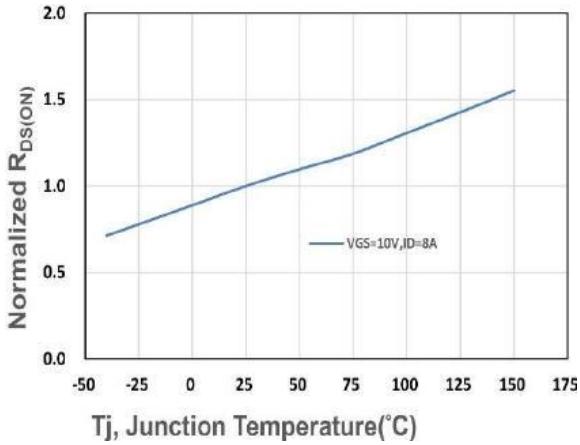


Figure 5. Drain-Source On Resistance

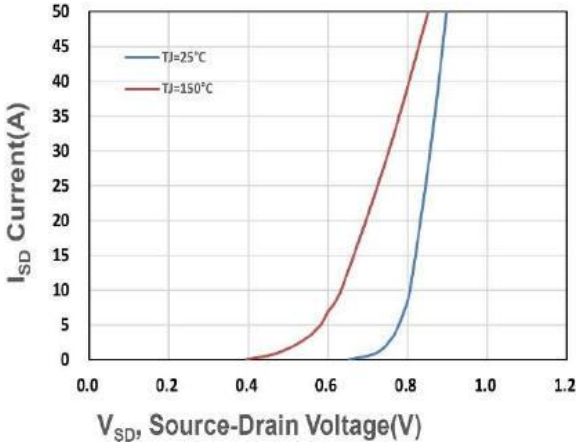


Figure 6. Source-Drain Diode Forward

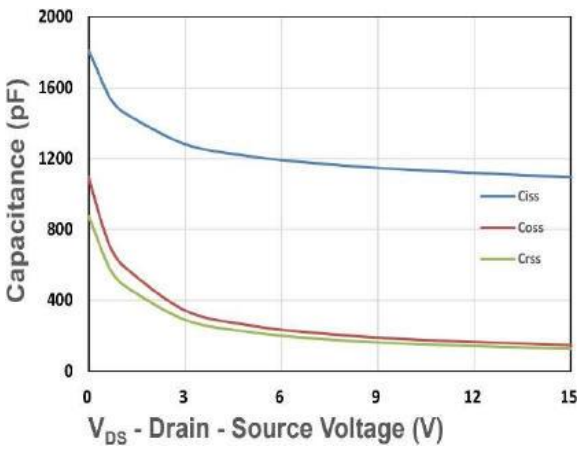


Figure 7. Capacitance

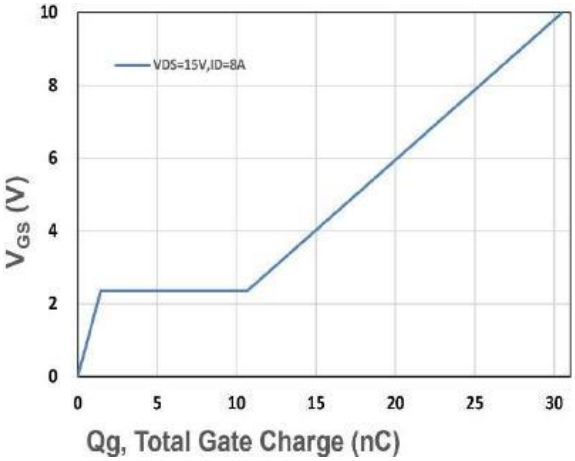


Figure 8. Gate Charge Characteristics

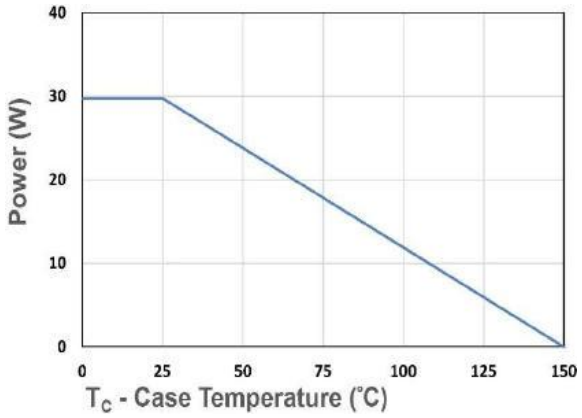


Figure 9. Power Dissipation

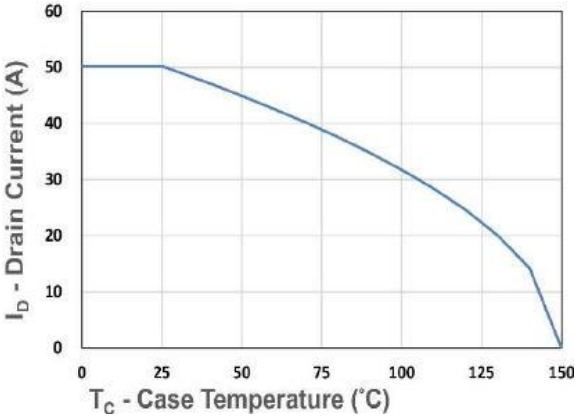


Figure 10. Drain Current

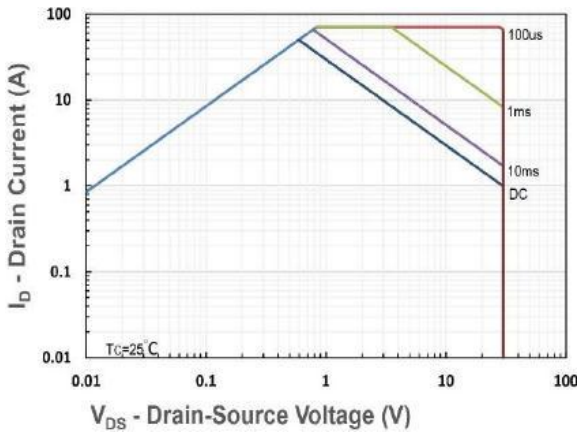


Figure 11. Safe Operating Area

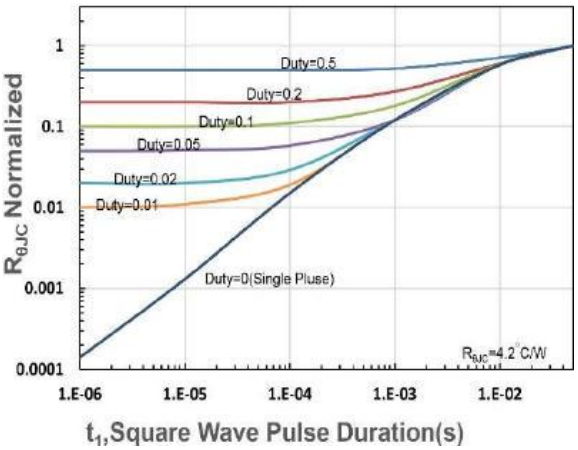
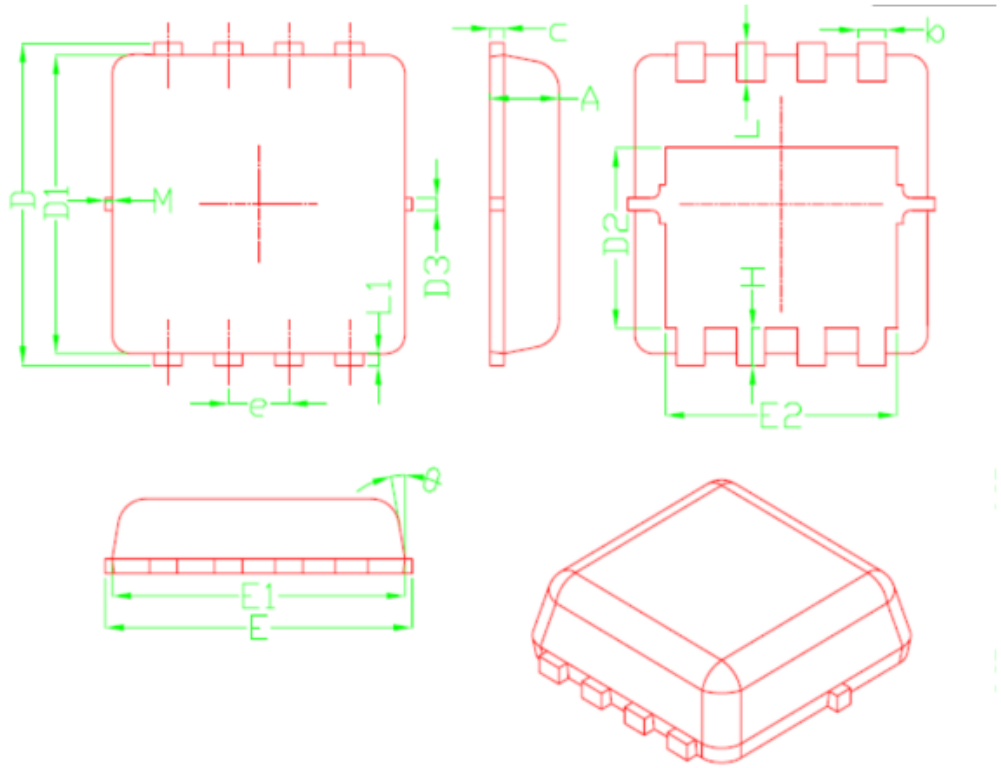


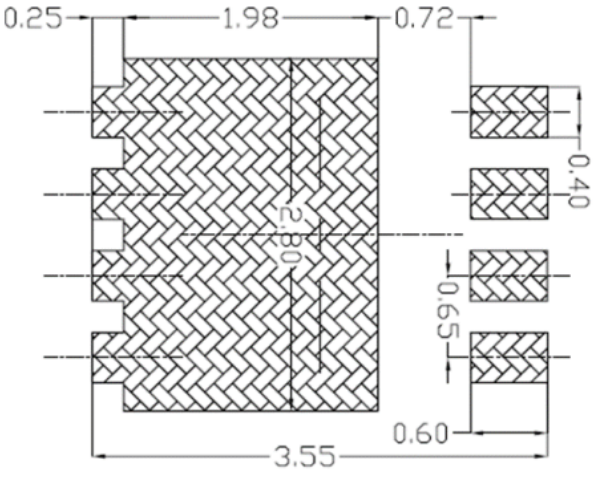
Figure 12. $R_{\theta JC}$ Transient Thermal Impedance

Package Information (PDFN3.3*3.3)



Outline Dimensions in mm

Unit:mm	Min	Typ	Max
A	0.70	0.75	0.80
b	0.25	0.30	0.35
c	0.10	0.15	0.25
D	3.25	3.35	3.45
D1	3.00	3.10	3.20
D2	1.78	1.88	1.98
D3	-	0.13	-
E	3.20	3.30	3.40
E1	3.00	3.15	3.20
E2	2.39	2.49	2.59
e	0.65 BSC		
H	0.30	0.39	0.50
L	0.30	0.40	0.50
L1	-	0.13	-
θ	-	10°	12°
M	-	-	0.15



Suggested Pad Layout (Unit:mm)

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