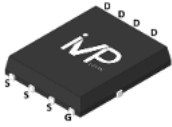
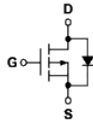


PDFN5*6

Symbol


Parameter	Value	Unit
V_{DS}	-30	V
$R_{DS(ON)-Max}$	8	m Ω
I_D	-67	A

Key Features

- Low $R_{DS(on)}$ application
- Reliable and Rugged
- ROHS Compliant & Halogen-Free
- 100% UIS Tested

Applications

- DC-DC converters
- Battery Powered System

Ordering Information

Ordering part Number	Marking code	Package	Form
VPLMDF7143	7143	PDFN5*6	Tape & Reel

Absolute Maximum Ratings ($T_J = 25^\circ\text{C}$, 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	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 to 150	$^\circ\text{C}$
Pulse Drain Current Tested	$T_C = 25^\circ\text{C}$ $I_{DM}^{(1)}$	-141	A
Continuous Drain Current	$T_C = 25^\circ\text{C}$ I_D	-67	A
	$T_C = 100^\circ\text{C}$	-43	
Maximum Power Dissipation	$T_C = 25^\circ\text{C}$ P_D	50	W
	$T_C = 100^\circ\text{C}$	20	
Avalanche Current, Single pulse	$L = 0.1\text{mH}$ $I_{AS}^{(2)}$	-33	A
Avalanche Energy, Single pulse	$L = 0.1\text{mH}$ $E_{AS}^{(2)}$	55	mJ

Thermal Characteristics

Parameter	Symbol	Rating	Unit
Thermal Resistance-Junction to Case	Steady State $R_{\theta JC}$	2.5	$^\circ\text{C/W}$
Thermal Resistance-Junction to Ambient	Steady State $R_{\theta JA}^{(3)}$	50	$^\circ\text{C/W}$

- ⁽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 1in^2 FR-4 board with 1oz.

Electrical Characteristics ($T_J = 25^\circ\text{C}$, unless otherwise specified)

Static Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	-30	-	-	V	$V_{GS}=0V, I_{DS}=-250\mu A$
Zero Gate Voltage Drain Current	I_{DSS}	-	-	-1	μA	$V_{DS}=-24V, V_{GS}=0V$
Gate Threshold Voltage	$V_{GS(th)}$	-1	-1.5	-2	V	$V_{DS}=V_{GS}, I_{DS}=-250\mu A$
Gate Leakage Current	I_{GSS}	-	-	± 100	nA	$V_{GS}=\pm 20V, V_{DS}=0V$
Drain-Source On-state Resistance	$R_{DS(ON)}^{(4)}$	-	6.5	8	m Ω	$V_{GS}=-10V, I_{DS}=-12A$
		-	8.2	10.7		$V_{GS}=-4.5V, I_{DS}=-9A$
Forward Transconductance	g_{fs}	-	35	-	S	$V_{DS}=-5V, I_{DS}=-12A$

Dynamic Characteristics⁽⁵⁾

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Gate Resistance	R_G	-	11	-	Ω	$V_{GS}=0V, V_{DS}=0V,$ Freq.=1MHz
Input Capacitance	C_{iss}	-	4430	-	pF	$V_{GS}=0V, V_{DS}=-15V,$ Freq.=1MHz
Output Capacitance	C_{oss}	-	500	-		
Reverse Transfer Capacitance	C_{rss}	-	373	-		
Turn-on Delay Time	$t_{d(ON)}$	-	51	-	nS	$V_{GS}=-10V, V_{DS}=-15V,$ $I_D=-1A, R_{GEN}=3\Omega$
Turn-on Rise Time	t_r	-	40	-		
Turn-off Delay Time	$t_{d(OFF)}$	-	77	-		
Turn-off Fall Time	t_f	-	56	-		

Gate Charge Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Total Gate Charge	Q_g	-	42	-	nC	$V_{GS}=-4.5V, V_{DS}=-15V,$ $I_D=-10A$
		-	88	-		$V_{GS}=-10V, V_{DS}=-15V,$ $I_D=-10A$
Gate-Source Charge	Q_{gs}	-	14	-		
Gate-Drain Charge	Q_{gd}	-	8.5	-		

Source Drain Diode Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Diode Forward Voltage	$V_{SD}^{(4)}$	-	-0.75	-1.1	V	$I_{SD}=-3.6A, V_{GS}=0V$
Reverse Recovery Time	t_{rr}	-	25	-	nS	$I_F=-3.6A, V_{GS}=-10V,$ & $di_F/dt=100A/\mu s$
Reverse Recovery Charge	Q_{rr}	-	15	-	nC	

- ⁽⁴⁾ Pulse test (pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$).
- ⁽⁵⁾ Guaranteed by design, not subject to production test

Electrical Characteristics Diagrams

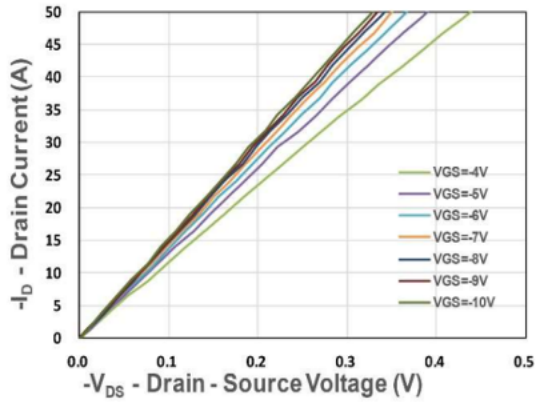


Figure 1. Output Characteristics

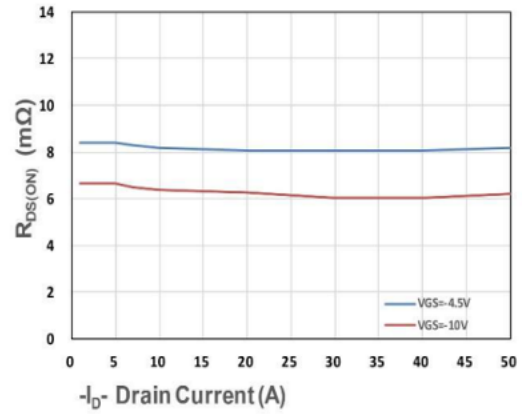


Figure 2. On-Resistance vs. I_D

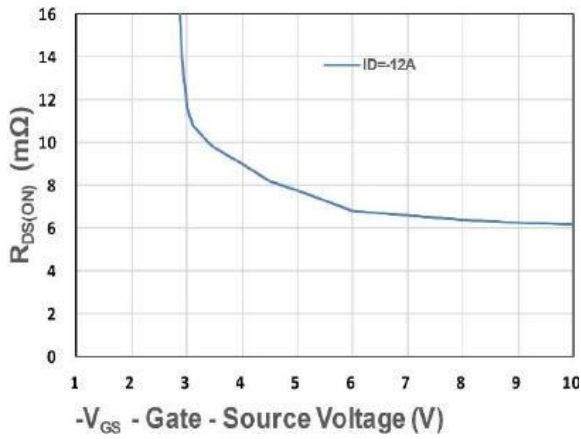


Figure 3. On-Resistance vs. V_{GS}

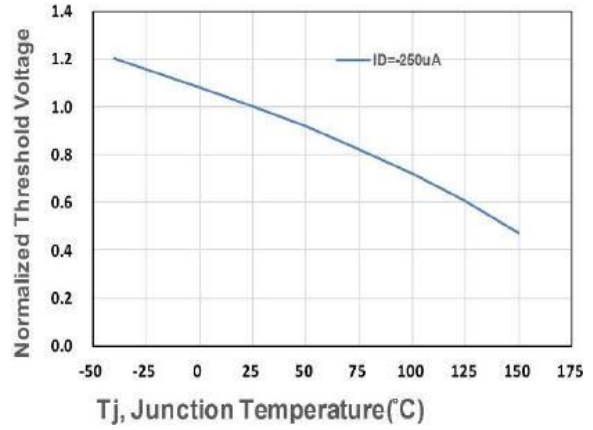


Figure 4. Gate Threshold Voltage

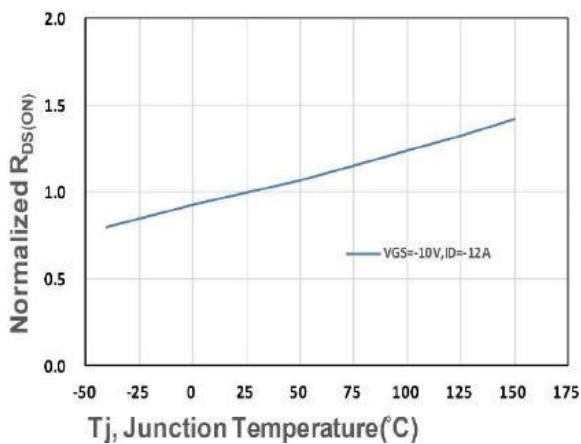


Figure 5. Drain-Source On Resistance

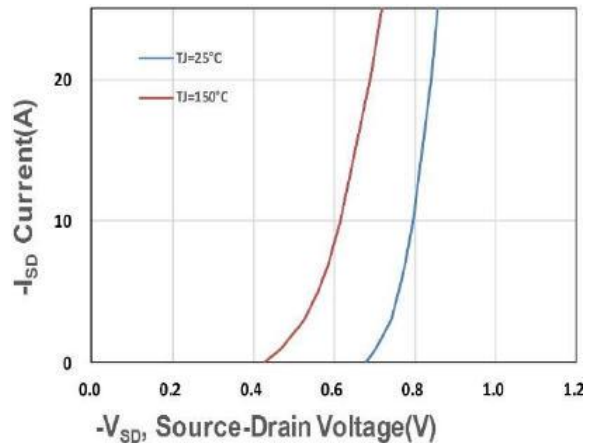


Figure 6. Source-Drain Diode Forward

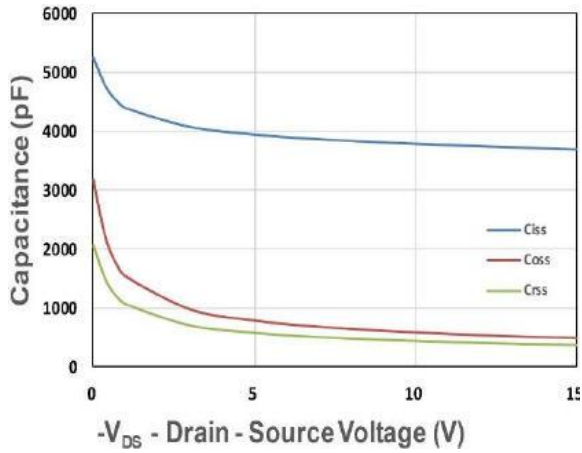


Figure 7. Capacitance

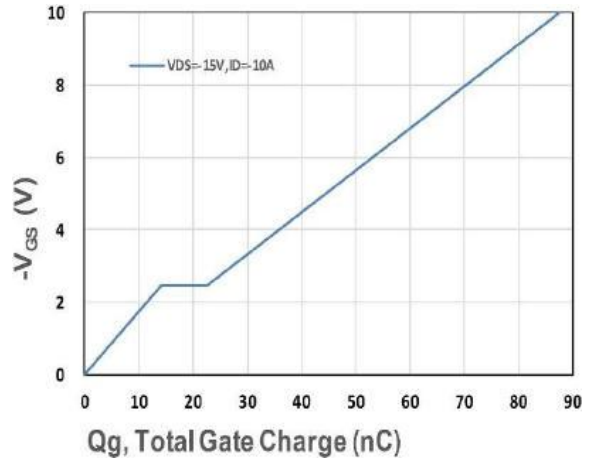


Figure 8. Gate Charge Characteristics

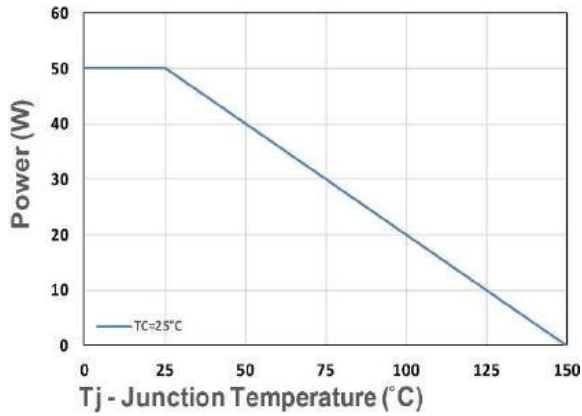


Figure 9. Power Dissipation

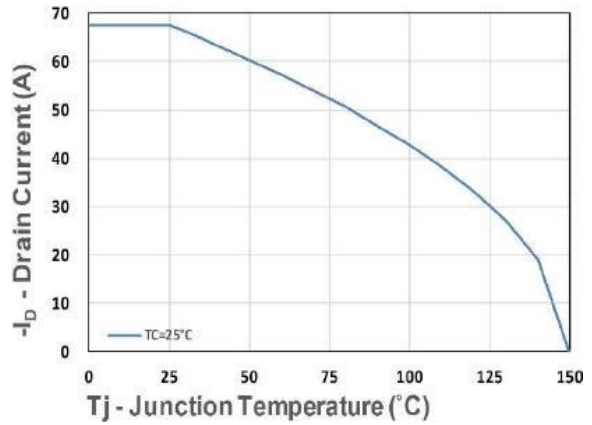


Figure 10. Drain Current

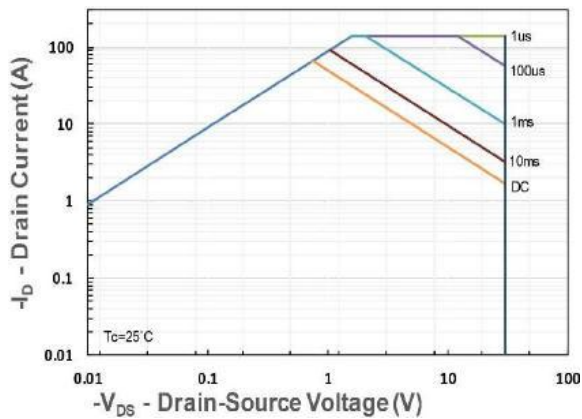


Figure 11. Safe Operating Area

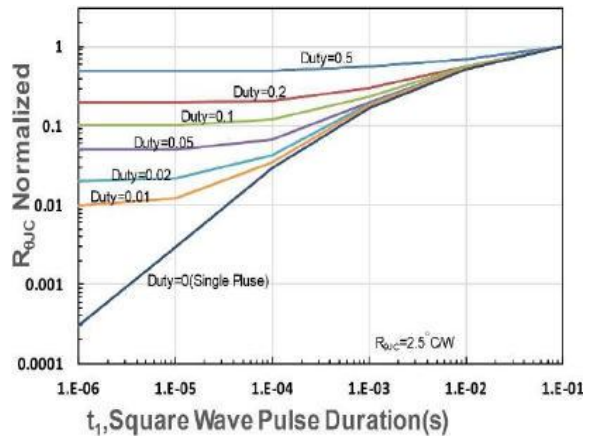
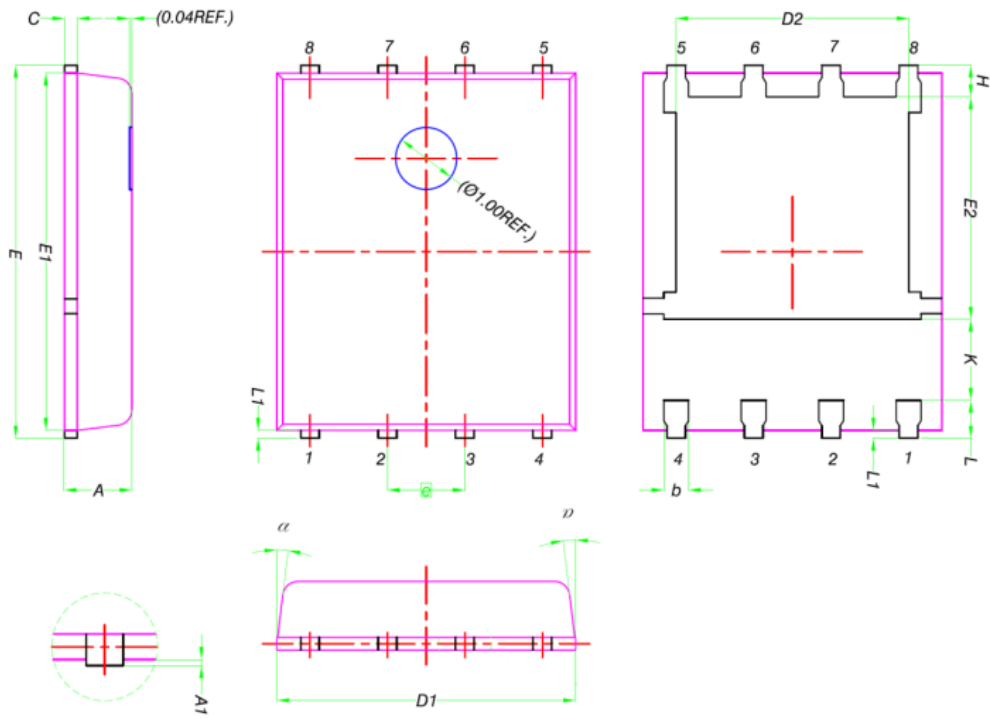


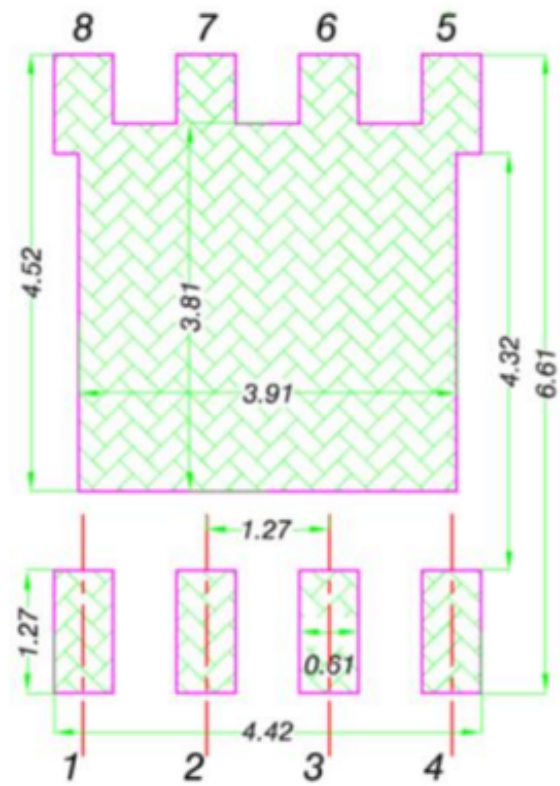
Figure 12. $R_{\theta JC}$ Transient Thermal Impedance

Package Information (PDFN5*6)



Outline dimensions in mm

Unit:mm	Min	Typ	Max
A	0.900	1.000	1.100
A1	0.000	-	0.050
b	0.330	0.410	0.510
C	0.200	0.250	0.300
D1	4.800	4.900	5.000
D2	3.610	3.810	3.960
E	5.900	6.000	6.100
E1	5.700	5.750	5.800
E2	3.380	3.580	3.780
e	1.27 BSC		
H	0.410	0.510	0.610
K	1.100	-	-
L	0.510	0.610	0.710
L1	0.060	0.130	0.200
α	0°	-	12°



Suggested Pad Layout (Unit:mm)

Disclaimer

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