

Product Summary

- V_{DS} -20 V
- I_{DS} (at $V_{GS}=-10V$) -90A
- $R_{DS(ON)}$ (at $V_{GS}=-10V$) $\leq 2.3m\Omega$ (TYP)

Application

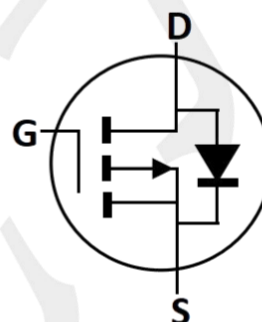
- Reverse Battery protection
- Load switch
- Power management
- PWM Application

Package and Pin Configuration



PDFN5X6-8

Circuit diagram



Equivalent Circuit

Absolute Maximum Ratings ($T_A=25^\circ\text{C}$ unless otherwise noted)

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current	I_D	$T_C=25^\circ\text{C}$ -90	A
		$T_C=100^\circ\text{C}$ -75	
Pulsed Drain Current	I_{DM}	-180	A
Single Pulse Avalanche Energy	EAS	370	mJ
Total Power Dissipation	P_{DTOT}	$T_C=25^\circ\text{C}$ 150	W
Operating Junction Temperature Range	T_J	-55 to +150	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-55 to +150	$^\circ\text{C}$

Thermal Characteristic

PARAMETER	Symbol	Value	Unit
Junction-to-Ambient Thermal Resistance	$R_{\theta JA}$	60	$^\circ\text{C/W}$
Thermal Resistance Junction-Case	$R_{\theta JC}$	0.9	$^\circ\text{C/W}$

Note : The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper.

Electrical Characteristics (T_A=25°C unless otherwise noted)

PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNIT
Static						
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	BV_{DSS}	-20	--	--	V
Gate-Source Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	$V_{GS(th)}$	-0.4	-0.6	-1.0	V
Gate-Source Leakage	$V_{DS}=0V, V_{GS}= \pm 12V$	I_{GSS}	--	--	± 500	nA
Zero Gate Voltage Drain Current	$V_{DS}= -20V, V_{GS}=0V$	I_{DSS}	--	-0.1	-1.0	μA
	$V_{DS}=-20V, T_J=55^{\circ}C$		--	-1.0	-5.0	μA
Drain-Source On-State Resistance (Note 1)	$V_{GS}=-10V, I_D= -20A$	$R_{DS(on)}$	--	2.3	2.5	m Ω
	$V_{GS}=-4.5V, I_D= -20A$		--	3.0	5.0	
	$V_{GS}=-2.5V, I_D= -20A$		--	4.3	6.0	
Forward Trans conductance	$V_{DS}= -5V, I_D= -20A$	g_{FS}	--	120	--	S
Dynamic (Note 2)						
Total Gate Charge (Note 3)	$V_{DS}= -10V,$ $I_D= -20A,$ $V_{GS}= -10V$	Q_g	--	136	--	nC
Gate-Source Charge (Note 3)		Q_{gs}	--	32	--	
Gate-Drain Charge (Note 3)		Q_{gd}	--	16	--	
Input Capacitance	$V_{DS}= -10V,$ $V_{GS}= 0V,$ $F= 1.0MHz$	C_{iss}	--	9246	--	pF
Output Capacitance		C_{oss}	--	1570	--	
Reverse Transfer Capacitance		C_{rss}	--	1180	--	
Switching						
Turn-On Delay Time (Note 3)	$V_{DD}= -10V,$ $I_D= -20A,$ $V_{GS}= -10V,$ $R_G= 3.3\Omega$	$t_{d(on)}$	--	22	--	nS
Rise Time (Note 3)		t_r	--	170	--	
Turn-Off Delay Time (Note 3)		$t_{d(off)}$	--	90	--	
Fall Time (Note 3)		t_f	--	26	--	
Source-Drain Diode Ratings and Characteristics (Note 2)						
Forward Voltage	$V_{GS}= 0V, I_F= -20A$	V_{SD}	--	-0.7	-1.2	V
Continuous Source Current	Integral reverse diode in the MOSFET	I_S	--	--	-90	A
Pulsed Current (Note 1)		I_{SM}	--	--	-180	A

Notes:

1. Pulse test; pulse width ≤ 300 μS, duty cycle ≤ 2%.
2. Guaranteed by design, not subject to production testing.
3. Independent of operating temperature

Typical Electrical and Thermal Characteristics

Figure 1. Output Characteristics

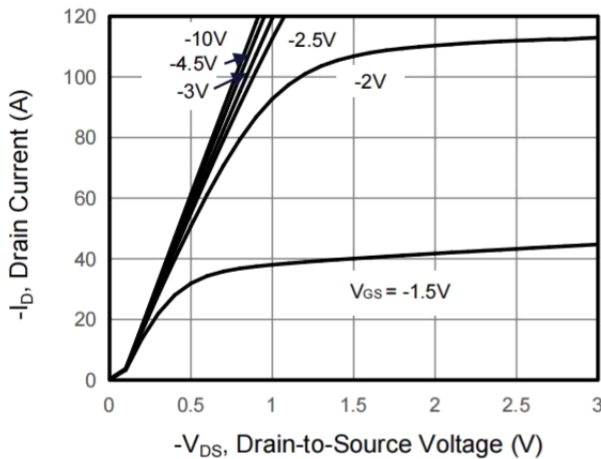


Figure 2. Transfer Characteristics

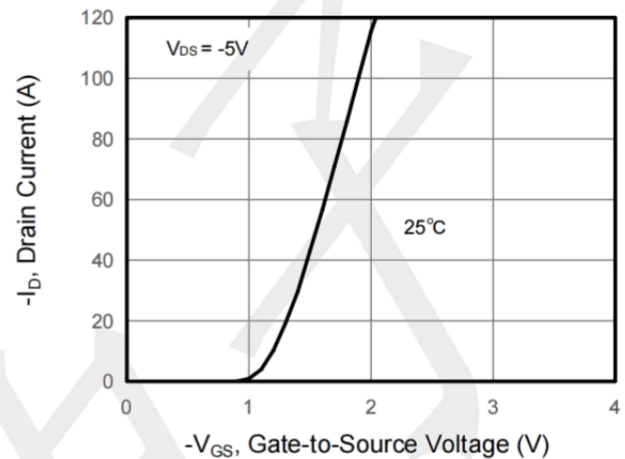


Figure 3. Drain Source On Resistance

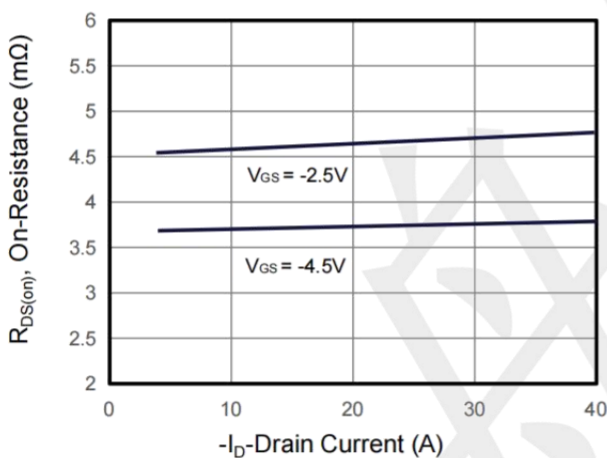


Figure 4. Gate Charge

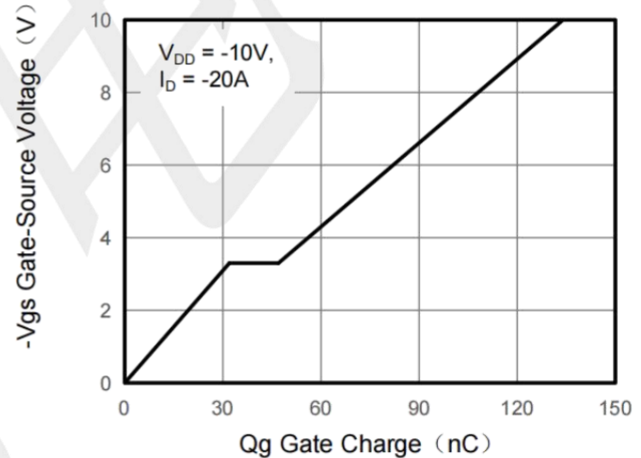


Figure 5. Capacitance

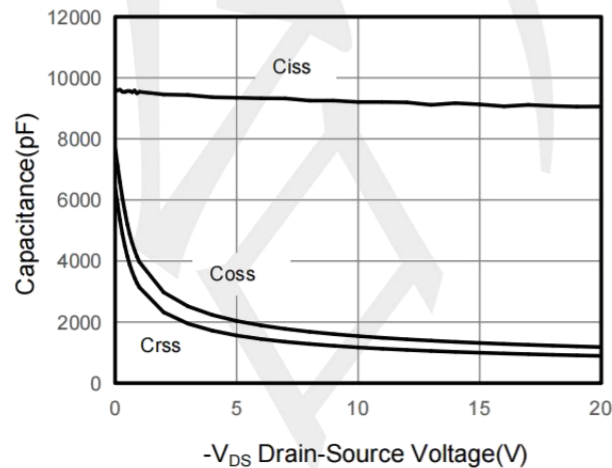
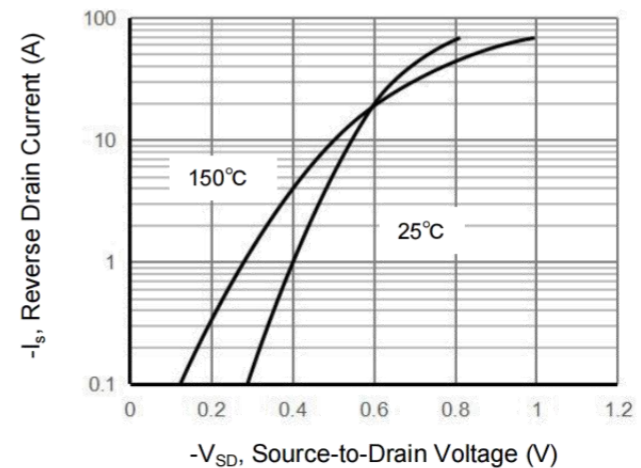
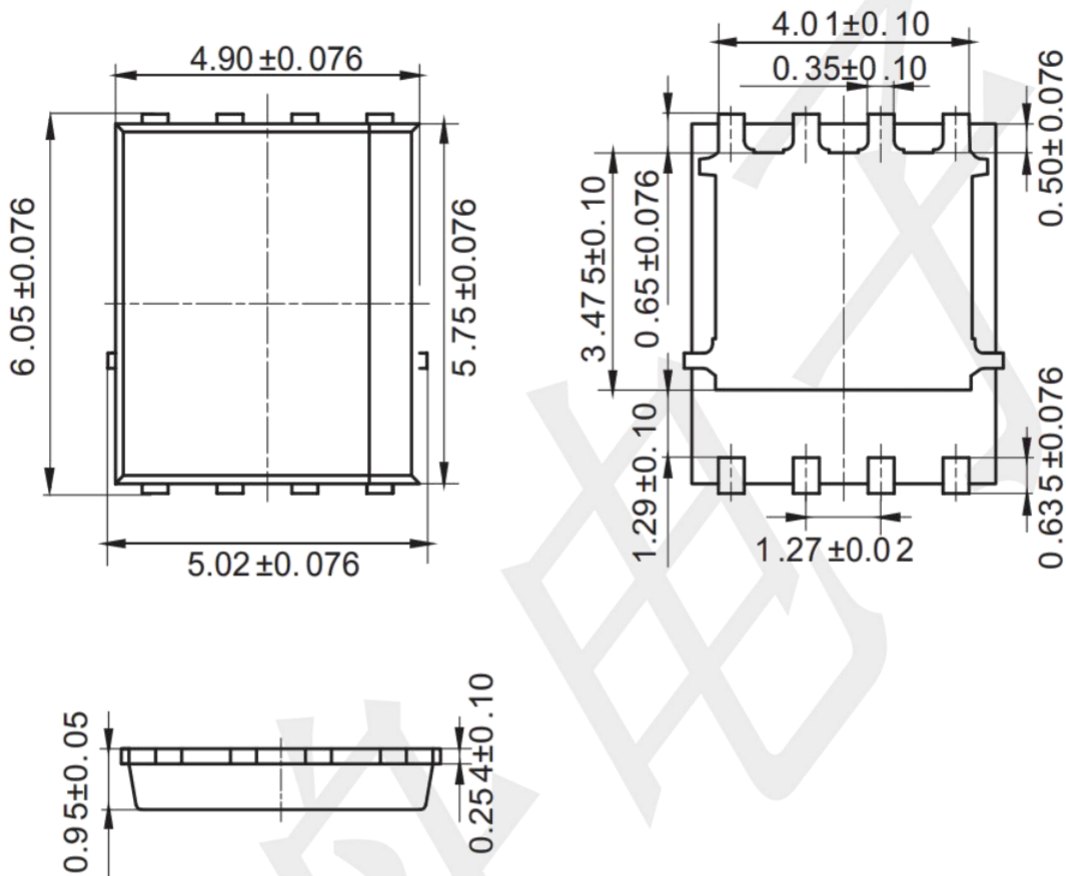


Figure 6. Source-Drain Diode Forward



Package Information

PDFN5X6-8



Mounting Pad Layout (unit: mm)

