

TPSIR512DP-T1-RE3

N-Channel Enhancement MOSFET

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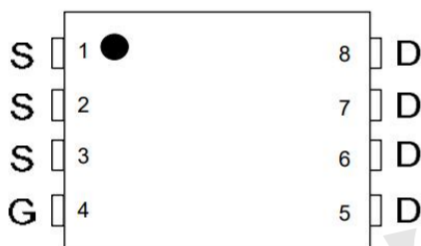
Product Summary

- V_{DS} 100 V
- I_{DS} (at $V_{GS}=10V$) 130A
- $R_{DS(ON)}$ (at $V_{GS}=10V$) $\leq 3.6m\Omega$ (TYP)

Application

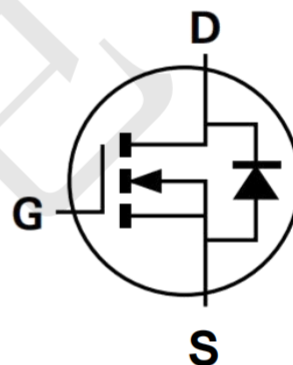
- Load switch
- High Frequency Switching and Synchronous Rectification
- Active Clamp in Intermediate
- DC/DC Power Supplies

Package and Pin Configuration



PDFN5X6-8

Circuit diagram



Absolute Maximum Ratings

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

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	$T_C=25^\circ\text{C}$	130
		$T_C=100^\circ\text{C}$	91
Pulsed Drain Current	I_{DM}	520	A
Single Pulse Avalanche Energy	EAS	338	mJ
Total Power Dissipation	P_{DTOT}	$T_C=25^\circ\text{C}$	180
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	$R_{\theta JA}$	55	$^\circ\text{C/W}$
Thermal Resistance Junction-Case	$R_{\theta JC}$	0.69	$^\circ\text{C/W}$

Note : The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper.

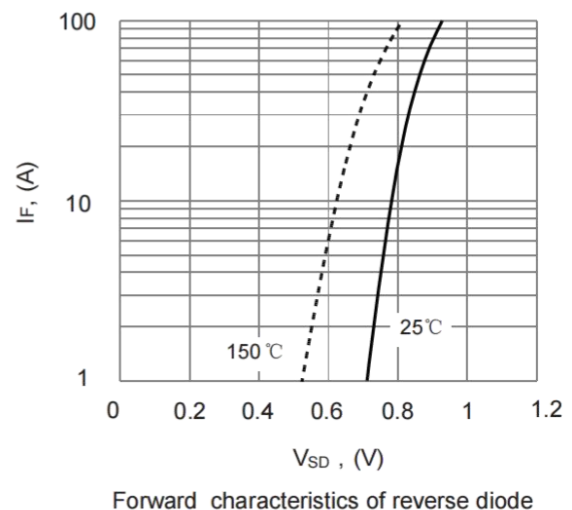
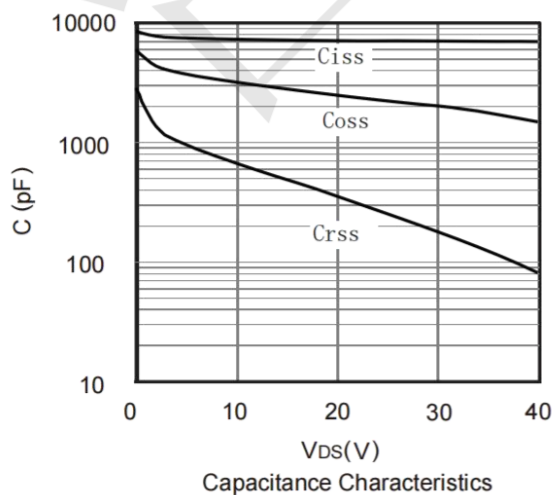
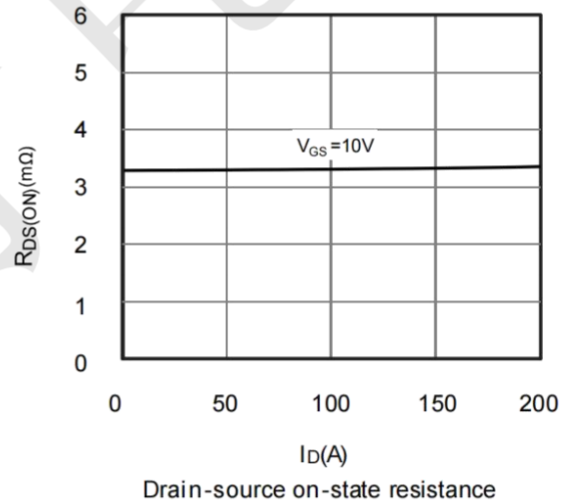
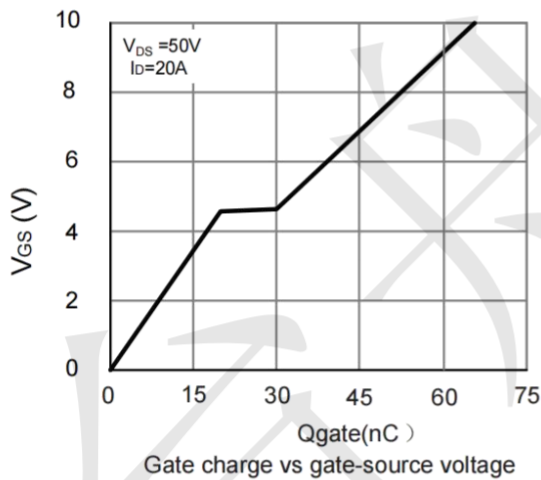
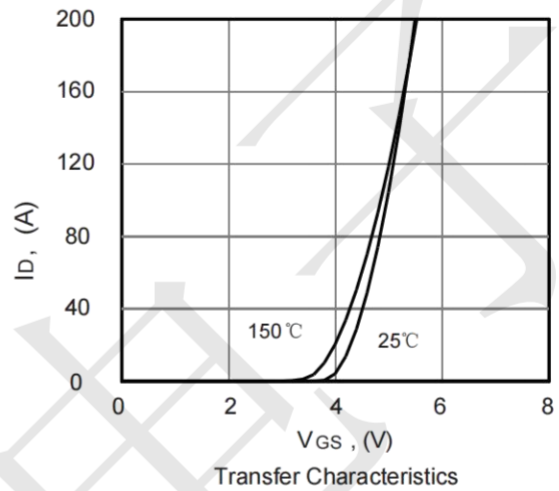
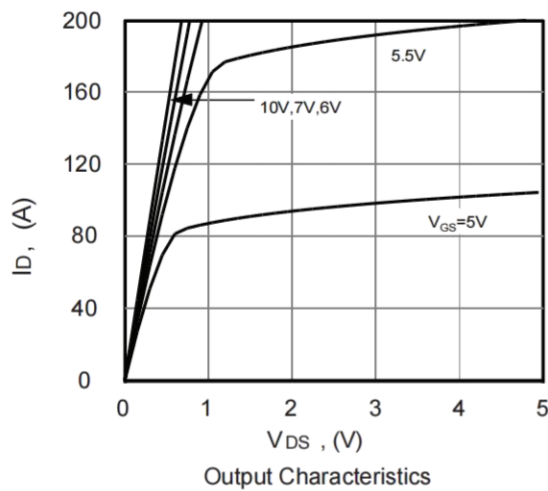
Electrical Characteristics (T_A=25°C unless otherwise noted)

PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNIT
Static						
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	BV_{DSS}	100	--	--	V
Gate-Source Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	$V_{GS(th)}$	2.0	3.0	4.0	V
Gate-Source Leakage	$V_{DS}=0V, V_{GS}=\pm 20V$	I_{GSS}	--	--	± 100	nA
Zero Gate Voltage Drain Current	$V_{DS}=90V, V_{GS}=0V$	I_{DSS}	--	0.1	1.0	μA
	$V_{DS}=90V, T_J=55^{\circ}C$		--	1.0	10	μA
Drain-Source On-State Resistance (Note 1)	$V_{GS}=10V, I_D=20A$	$R_{DS(on)}$	--	3.6	4.0	m Ω
Dynamic (Note 2)						
Total Gate Charge (Note 3)	$V_{DS}=50V, I_D=20A, V_{GS}=10V$	Q_g	--	65	--	nC
Gate-Source Charge (Note 3)		Q_{gs}	--	20	--	
Gate-Drain Charge (Note 3)		Q_{gd}	--	10	--	
Input Capacitance	$V_{DS}=25V, V_{GS}=0V, F=1.0MHz$	C_{iss}	--	7300	--	pF
Output Capacitance		C_{oss}	--	2300	--	
Reverse Transfer Capacitance		C_{rss}	--	260	--	
Switching						
Turn-On Delay Time (Note 3)	$V_{DD}=50V, I_D=20A, V_{GS}=10V, R_G=3\Omega$	$t_{d(on)}$	--	20	--	nS
Rise Time (Note 3)		t_r	--	6	--	
Turn-Off Delay Time (Note 3)		$t_{d(off)}$	--	40	--	
Fall Time (Note 3)		t_f	--	10	--	
Source-Drain Diode Ratings and Characteristics (Note 2)						
Forward Voltage	$V_{GS}=0V, I_F=10A$	V_{SD}	--	0.8	1.2	V
Continuous Source Current	Integral reverse diode in the MOSFET	I_S	--	--	130	A
Pulsed Current (Note 1)		I_{SM}	--	--	520	A

Notes:

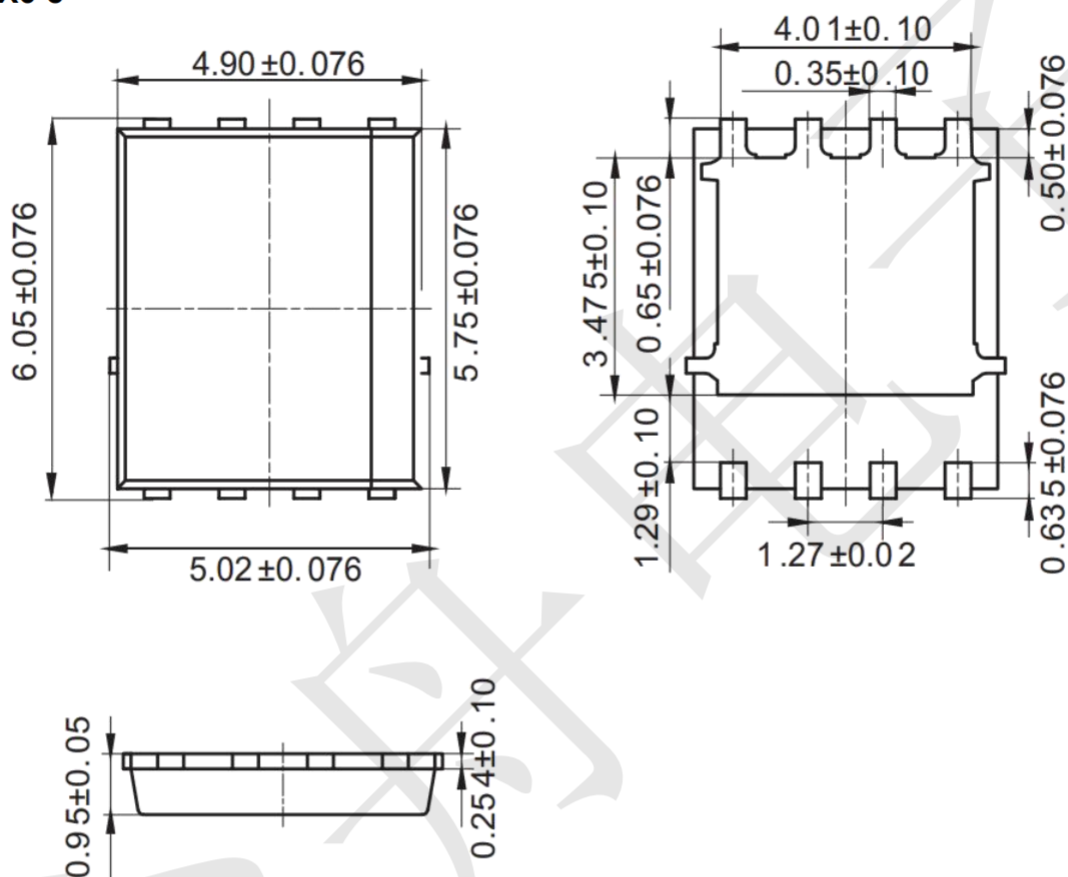
1. Pulse test; pulse width ≤ 300 μS, duty cycle ≤ 2%.
2. Guaranteed by design, not subject to production testing.
3. Independent of operating temperature

Typical Electrical and Thermal Characteristics



Package Information

PDFN5X6-8



Mounting Pad Layout (unit: mm)

