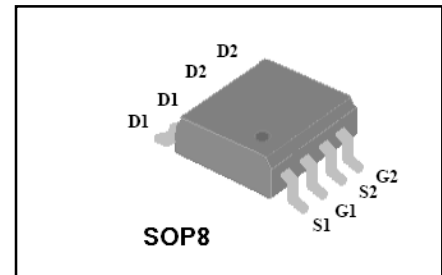
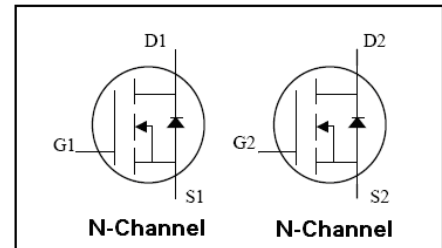


## Features

- ◆  $BVDSS > 30V$ ,  $R_{DS(ON)} = 23m\Omega(Typ) @ V_{GS} = 10V$
- ◆ Low On-Resistance
- ◆ Fast Switching
- ◆ Lead-Free, Hg-Free, Green Product

PTS4936 designed by the trench processing techniques to achieve extremely low on-resistance. And fast switching speed and improved transfer effective. These features combine to make this design an extremely efficient and reliable device for variety of DC-DC applications.

## Pin Description



## Absolute Maximum Ratings

Symbol	Parameter	Rating		Unit
		NMOS		
<b>Common Ratings (<math>T_C = 25^\circ\text{C}</math> Unless Otherwise Noted)</b>				
$V_{GS}$	Gate-Source Voltage	$\pm 20$		V
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	30		V
$T_J$	Maximum Junction Temperature	175		$^\circ\text{C}$
$T_{STG}$	Storage Temperature Range	-50 to 150		$^\circ\text{C}$
$I_S$	Diode Continuous Forward Current	$T_C = 25^\circ\text{C}$	5	A
<b>Mounted on Large Heat Sink</b>				
$I_{DM}$	Pulse Drain Current Tested <sup>(Note 1)</sup>	$T_C = 25^\circ\text{C}$	20	A
$I_D$	Continuous Drain Current ( $V_{GS} = 10V$ )	$T_C = 25^\circ\text{C}$	5.8	A
		$T_C = 100^\circ\text{C}$	4.2	
$P_D$	Maximum Power Dissipation	$T_C = 25^\circ\text{C}$	2	W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient	89		$^\circ\text{C/W}$

## 30V/5.8A Dual N-Channel Advanced Power MOSFET

Symbol	Parameter	Condition	Min	Typ	Max	Unit
<b>Static Electrical Characteristics @ T<sub>J</sub> = 25°C (unless otherwise stated)</b> <sup>(Note 3)</sup>						
V <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	30	--	--	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =24V, V <sub>GS</sub> =0V	--	--	1	μA
I <sub>GSS</sub>	Gate-Body Leakage Current	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	--	--	±100	nA
V <sub>GS(TH)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1.0	1.6	2.5	V
R <sub>DS(ON)</sub>	Drain-Source On-State Resistance	V <sub>GS</sub> =10V, I <sub>D</sub> =5.8A	--	23	31	mΩ
R <sub>DS(ON)</sub>	Drain-Source On-State Resistance	V <sub>GS</sub> =4.5V, I <sub>D</sub> =5A	--	32	43	mΩ
<b>Dynamic Electrical Characteristics @ T<sub>J</sub> = 25°C (unless otherwise stated)</b> <sup>(Note 4)</sup>						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =15V, V <sub>GS</sub> =0V, f=1MHz	--	255	--	pF
C <sub>oss</sub>	Output Capacitance		--	45	--	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		--	35	--	pF
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =15V, I <sub>D</sub> =5A, V <sub>GS</sub> =10V	--	5.2	--	nC
Q <sub>gs</sub>	GateSource Charge		--	0.85	--	nC
Q <sub>gd</sub>	GateDrain Charge		--	1.3	--	nC
<b>Switching Characteristics</b> <sup>(Note 4)</sup>						
t <sub>d(on)</sub>	Turnon Delay Time	V <sub>DD</sub> =15V, R <sub>L</sub> =3Ω V <sub>GS</sub> =10V, R <sub>GS</sub> =3Ω	--	4.5	--	ns
t <sub>r</sub>	Turnon Rise Time		--	2.5	--	ns
t <sub>d(off)</sub>	TurnOff Delay Time		-	14.5	--	ns
t <sub>f</sub>	TurnOff Fall Time		--	3.5	--	ns
<b>Source Drain Diode Characteristics</b>						
I <sub>SD</sub>	Sourcedrain current(Body Diode) <sup>(Note 2)</sup>	T <sub>C</sub> =25°C	5	--	--	A
V <sub>SD</sub>	Forward on voltage <sup>(Note 3)</sup>	T <sub>J</sub> =25°C, I <sub>SD</sub> =3A, V <sub>GS</sub> =0V	--	0.82	1.3	V

**Notes:**

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production

Typical Electrical and Thermal Characteristics

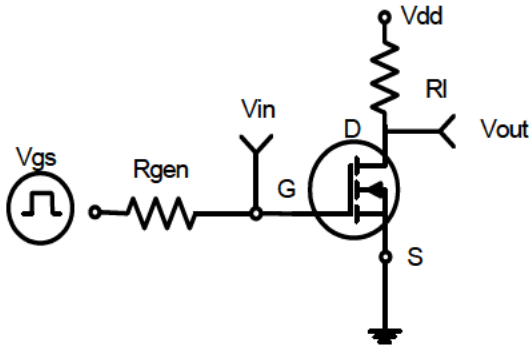


Figure 1: Switching Test Circuit

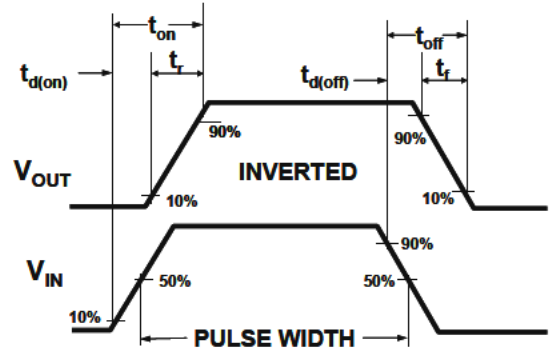


Figure 2: Switching Waveforms

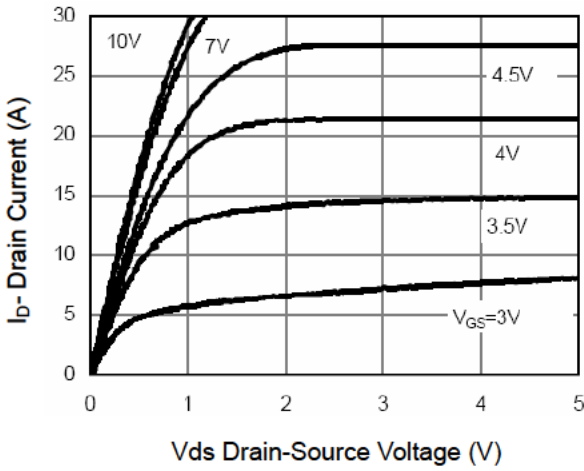


Figure 3 Output Characteristics

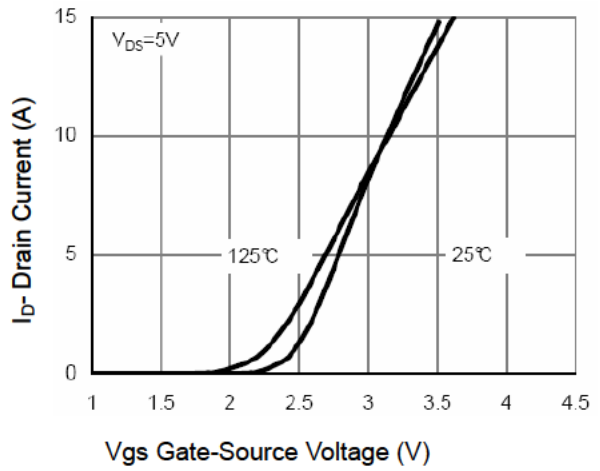


Figure 4 Transfer Characteristics

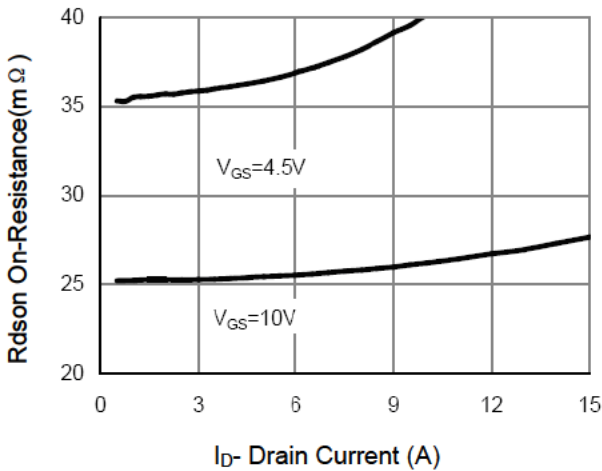


Figure 5 Drain-Source On-Resistance

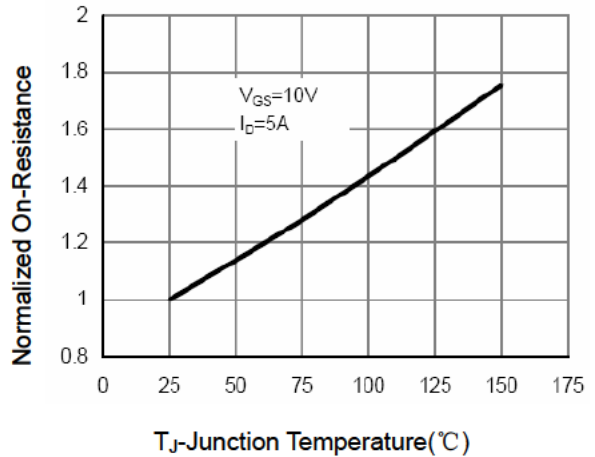
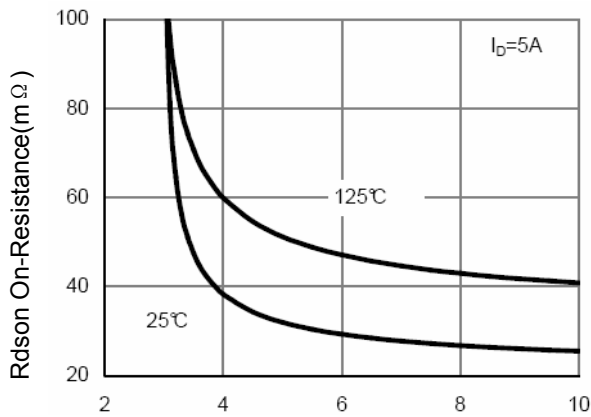
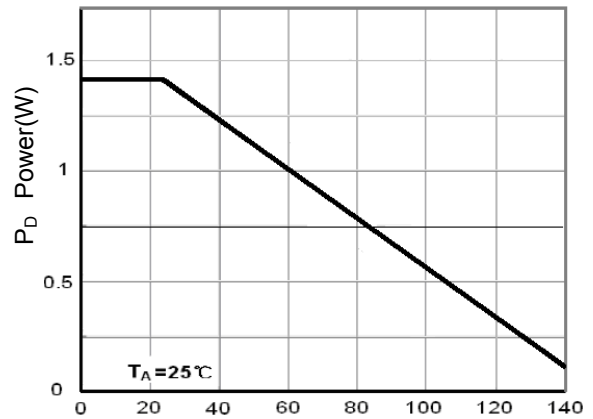


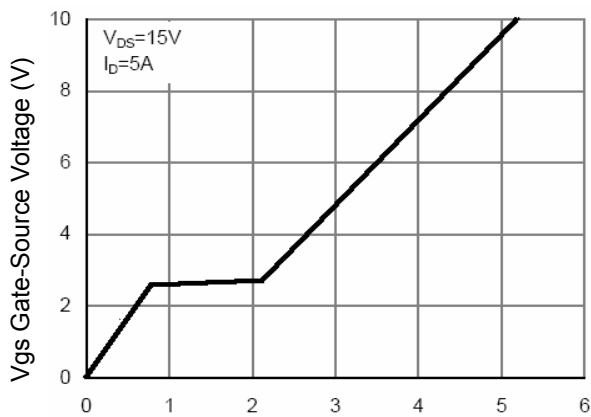
Figure 6 Drain-Source On-Resistance



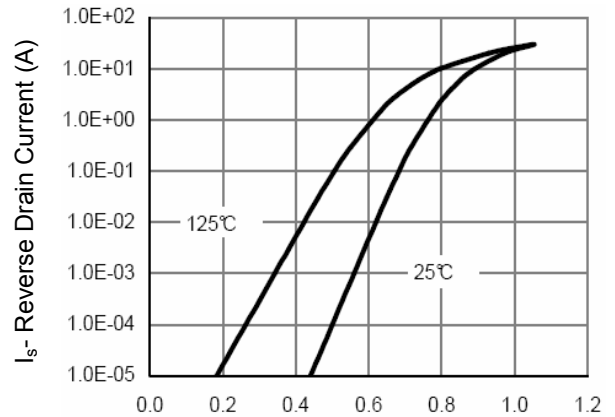
Vgs Gate-Source Voltage (V)  
**Figure 7 Rdson vs Vgs**



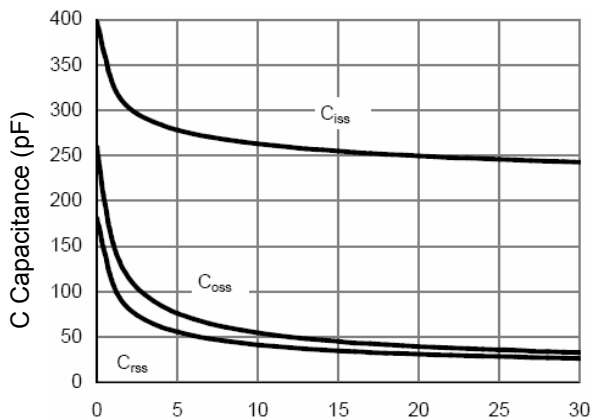
Tj Junction Temperature (°C)  
**Figure 8 Power Dissipation**



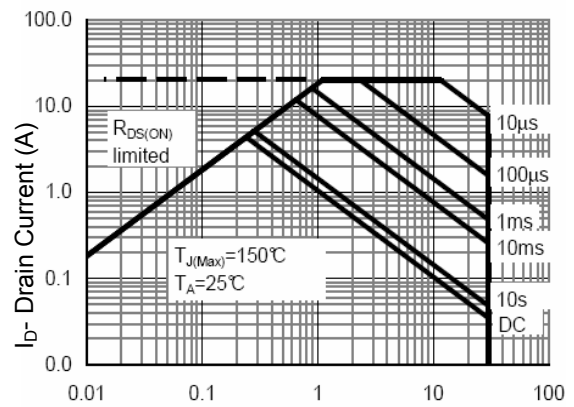
Qg Gate Charge (nC)  
**Figure 9 Gate Charge**



Vds Drain-Source Voltage (V)  
**Figure 10 Source- Drain Diode Forward**



Vds Drain-Source Voltage (V)  
**Figure 11 Capacitance vs Vds**



Vds Drain-Source Voltage (V)  
**Figure 12 Safe Operation Area**

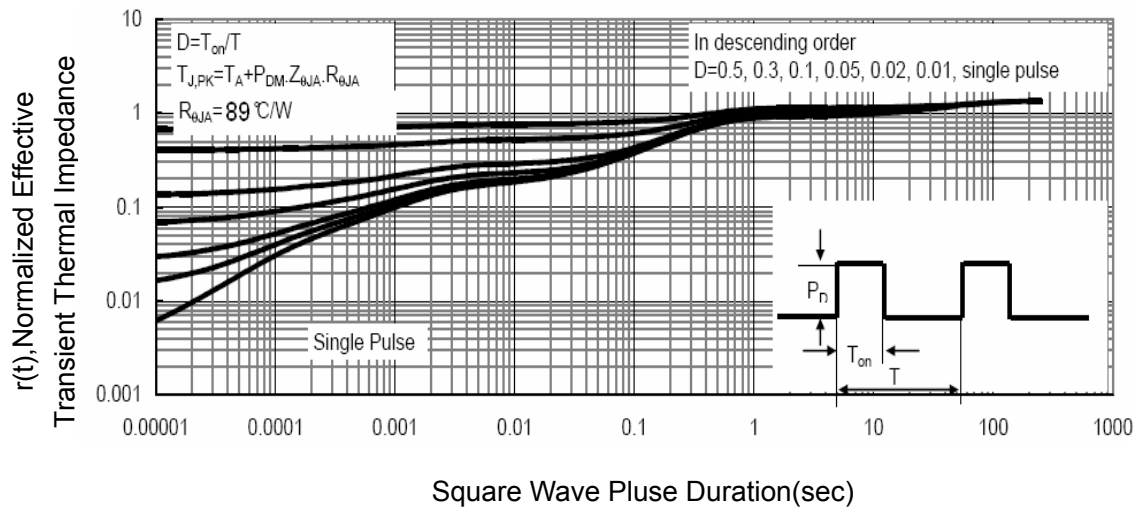


Figure 13 Normalized Maximum Transient Thermal Impedance

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