

## ➤ General Description

This PAN0416S N-Channel enhancement mode power field effect transistor is the high density trench technology and this advanced technology can provide excellent  $R_{ds(On)}$  performance and efficiency for power switching and load switching application., this device also comply with the RoHS and Green Product requirement with full function reliability approved.

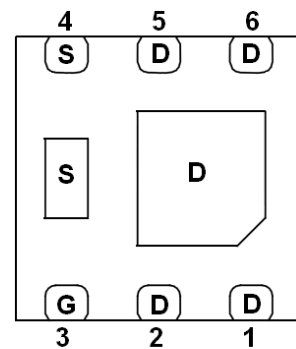
## ➤ Feature

- Super high density cell design for extremely low  $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- DFN2X2-6L package design

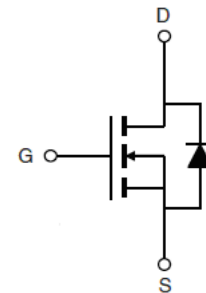
## ➤ Application

- DC/DC Converter
- Full-Bridge Converters
- For Power Bricks and POL Power

## ➤ DFN2X2-6L



BOTTOM VIEW



N-Channel MOSFET

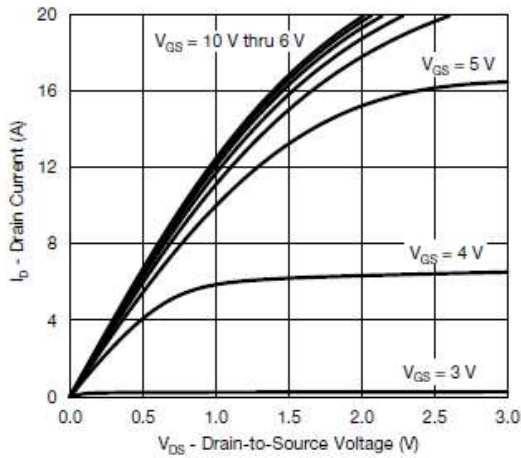
## ➤ Absolute Maximum Ratings

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DSS}$	100	V
Gate -Source Voltage	$V_{GSS}$	$\pm 20$	V
Continuous Drain Current ( $T_J=150^\circ C$ )	$I_D$	$T_A=25^\circ C$	8
		$T_A=70^\circ C$	6
Pulsed Drain Current	$I_{DM}$	15	A
Continuous Source Current (Diode Conduction)	$I_S$	2.9	A
Power Dissipation	$P_D$	$T_A=25^\circ C$	3.5
		$T_A=70^\circ C$	2.2
Operating Junction Temperature	$T_J$	150	$^\circ C$
Storage Temperature Range	$T_{STG}$	-55/150	$^\circ C$
Thermal Resistance-Junction to Ambient	$R_{\theta JA}$	36	$^\circ C/W$

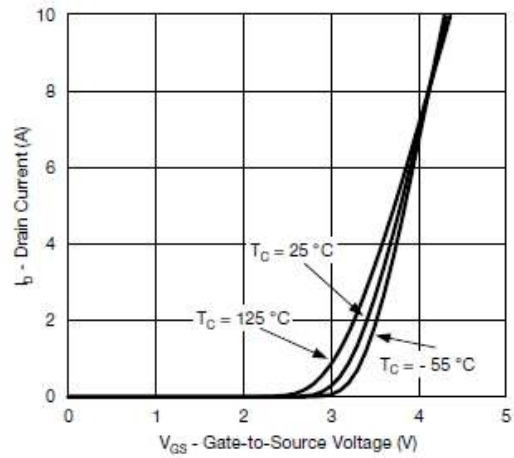
➤ **Electrical Characteristics ( $T_A=25^\circ C$  Unless otherwise noted)**

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	100			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.8		2.5	
Gate Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 20V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=80V, V_{GS}=0V$			1	uA
		$V_{DS}=80V, V_{GS}=0V$ $T_J=85^\circ C$			10	
On-State Drain Current	$I_{D(on)}$	$V_{DS} \geq 5V, V_{GS}=10V$	8			A
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=3.2A$		105	120	m $\Omega$
		$V_{GS}=4.5V, I_D=2.6A$		115	130	
Forward Transconductance	$g_{FS}$	$V_{DS}=10V, I_D=3.2A$		8		S
Diode Forward Voltage	$V_{SD}$	$I_S=2.6A, V_{GS}=0V$		0.85	1.2	V
<b>Dynamic</b>						
Total Gate Charge	$Q_g$	$V_{DS}=50V, V_{GS}=4.5V$ $I_D=4.8A$		4	8	nC
Gate-Source Charge	$Q_{gs}$			1.4		
Gate-Drain Charge	$Q_{gd}$			2.0		
Input Capacitance	$C_{iss}$	$V_{DS}=50V, V_{GS}=0V$ $f=1MHz$		350		pF
Output Capacitance	$C_{oss}$			98		
Reverse Transfer Capacitance	$C_{rss}$			20		
Turn-On Time	$t_{d(on)}$	$V_{DD}=50V, R_L=12.8\Omega$ $I_D=3.9A, V_{GEN}=10V$ $R_G=1\Omega$		8	20	ns
	$t_r$			15	30	
Turn-Off Time	$t_{d(off)}$			12	25	
	$t_f$			12	25	

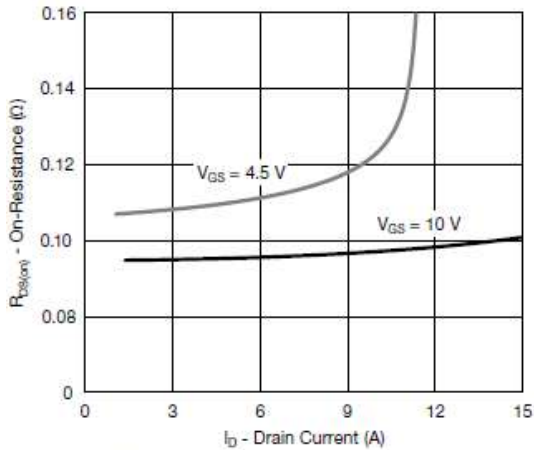
## ➤ Typical Characteristics



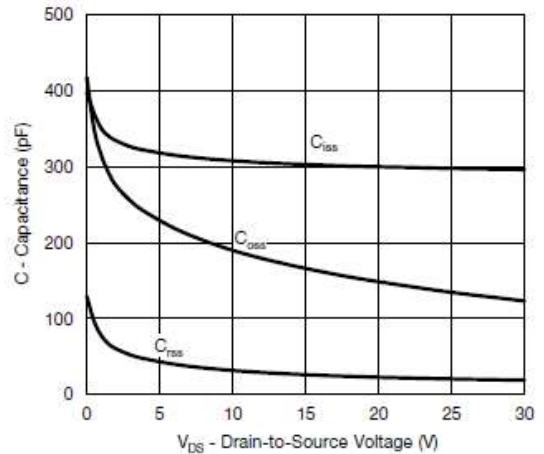
**Output Characteristics**



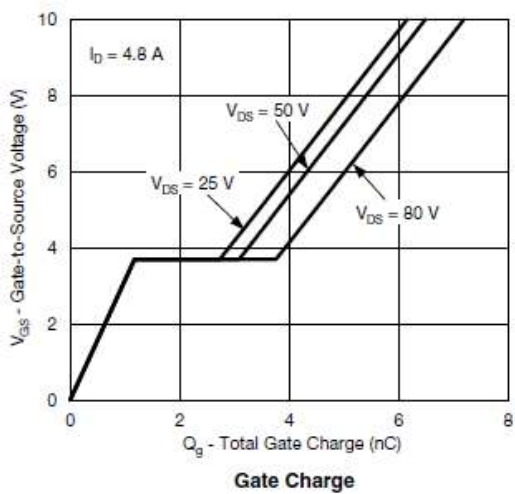
**Transfer Characteristics**



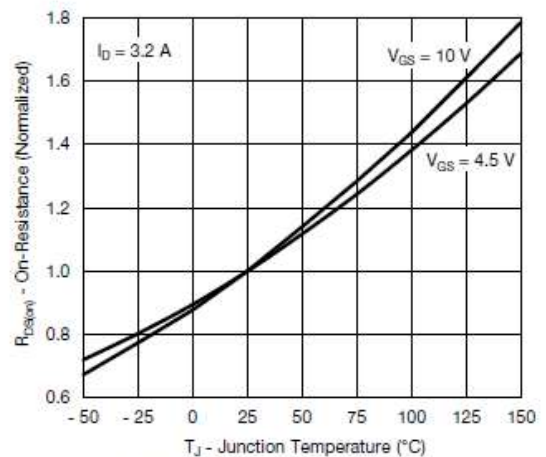
**On-Resistance vs. Drain Current and Gate Voltage**



**Capacitance**

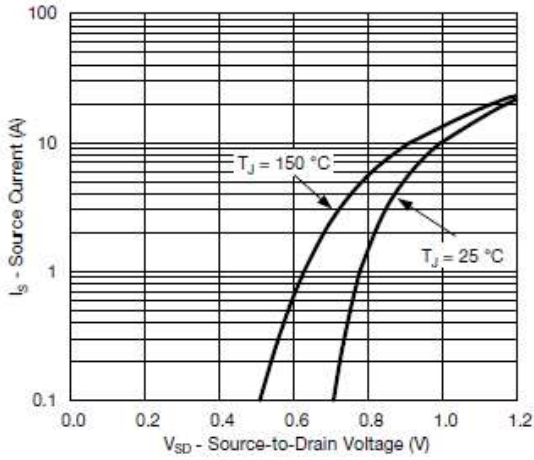


**Gate Charge**

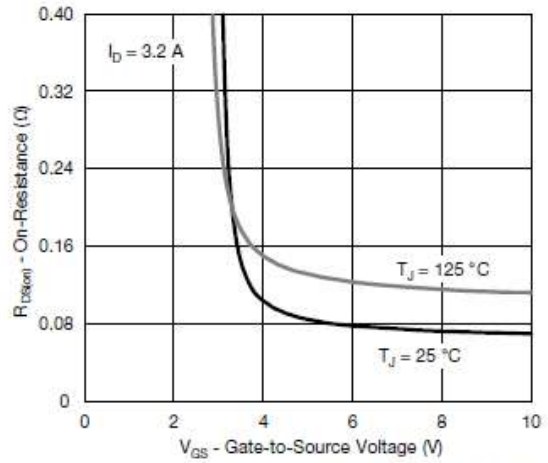


**On-Resistance vs. Junction Temperature**

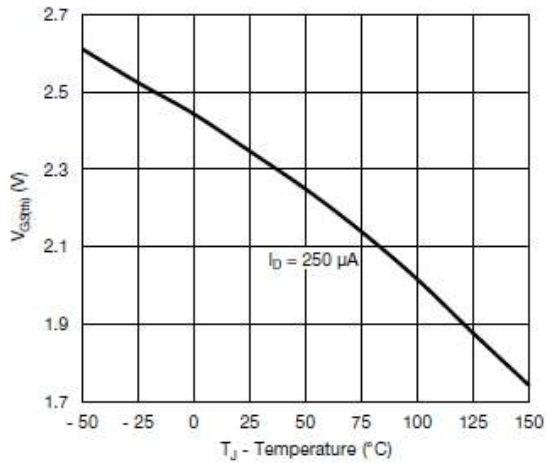
**N-Ch 100V Fast Switching MOSFET**  
 **$V_{DS}=100V$ ,  $I_D=8.0A$ ,  $R_{DS(ON)}=120m\Omega$**



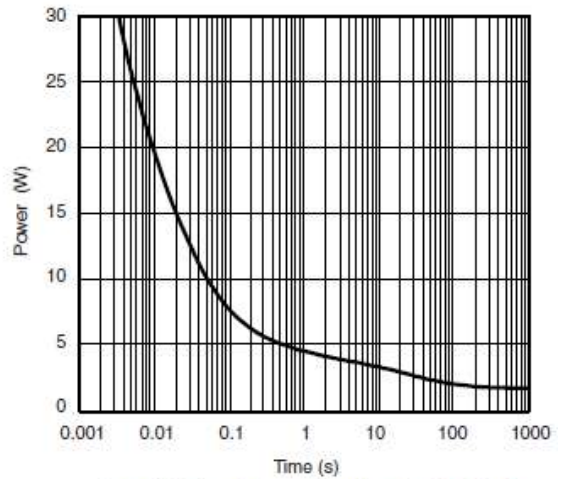
**Source-Drain Diode Forward Voltage**



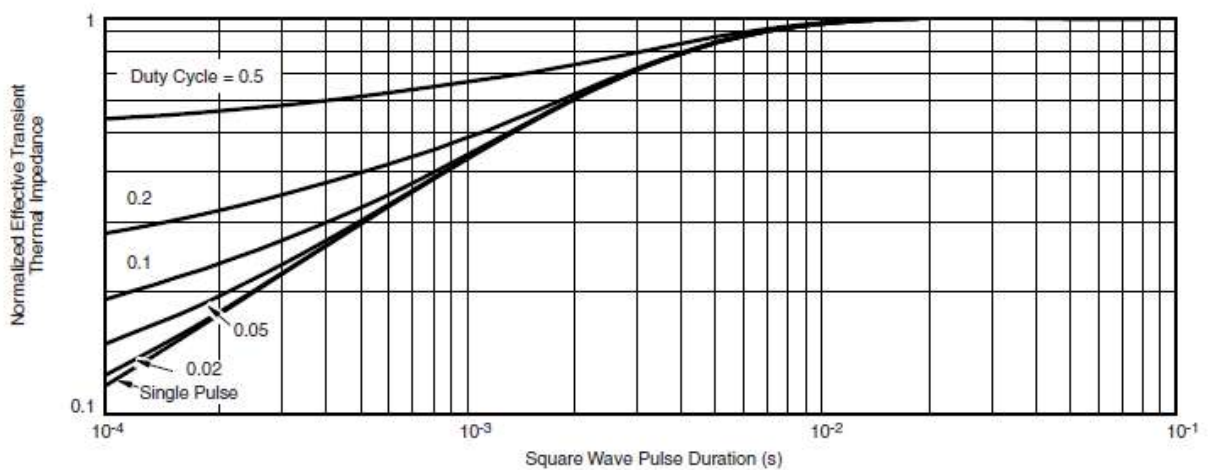
**On-Resistance vs. Gate-to-Source Voltage**



**Threshold Voltage**

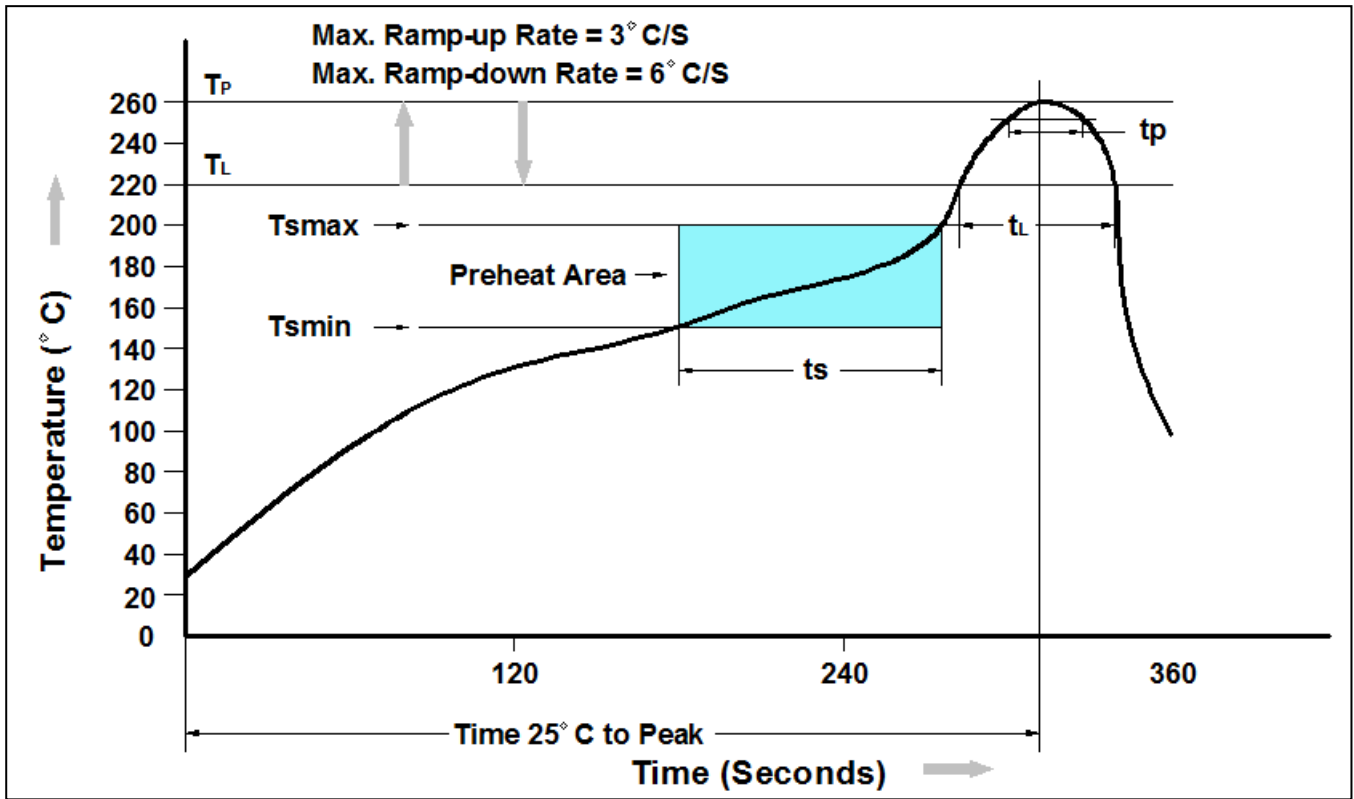


**Single Pulse Power, Junction-to-Ambient**



**Normalized Thermal Transient Impedance. Junction-to-Case**

➤ Recommand IR Reflow Soldering Thermal Profile

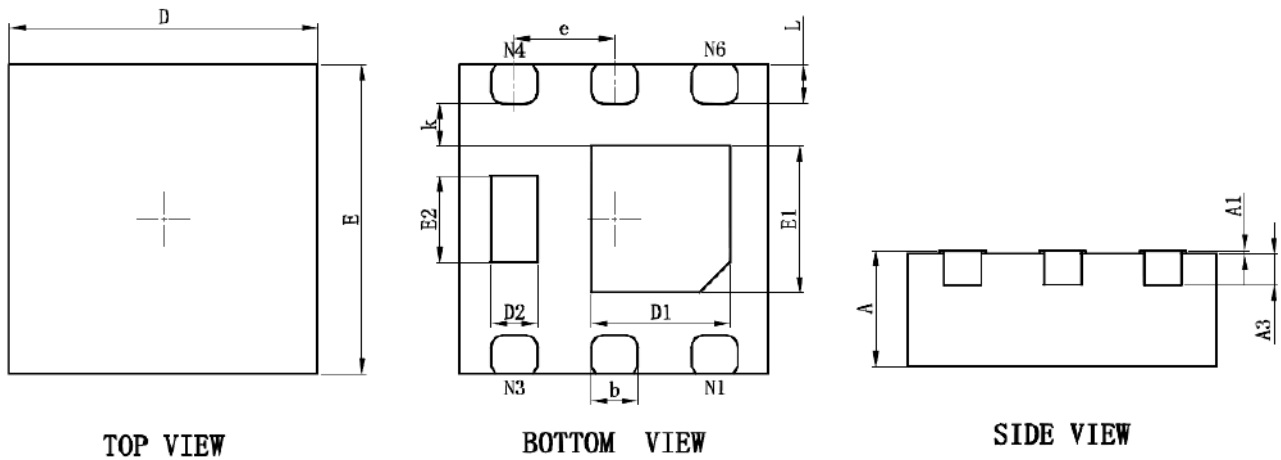


Profile Feature	Pb-Free Assembly Profile
Temperature Min. ( $T_{smin}$ )	150°C
Temperature Max. ( $T_{smax}$ )	200°C
Time ( $t_s$ ) from ( $T_{smin}$ to $T_{smax}$ )	60-120 seconds
Average Ramp-up Rate ( $t_L$ to $t_P$ )	3°C/second max.
Liquidous Temperature ( $T_L$ )	217°C
Time ( $t_L$ ) Maintained Above ( $T_L$ )	60 – 150 seconds
Peak Temperature	260°C +0°C / -5°C
Time ( $t_P$ ) within 5°C of actual Peak Temperature	30 seconds
Ramp-down Rate ( $T_P$ to $T_L$ )	6°C/second max
Time 25°C to Peak Temperature	8 minutes max.

➤ Ordering Information

Part Number	Description	Quantity
PAN0416S	DFN2X2-6L Reel	4000 pcs

➤ Package Information (DFN2X2-6L)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.800	0.028	0.031
A1	0.000	0.050	0.000	0.002
A3	0.203REF.		0.008REF.	
D	1.924	2.076	0.076	0.082
E	1.924	2.076	0.076	0.082
D1	0.800	1.000	0.031	0.039
E1	0.850	1.050	0.033	0.041
D2	0.200	0.400	0.008	0.016
E2	0.460	0.660	0.018	0.026
k	0.200MIN.		0.008MIN.	
b	0.250	0.350	0.010	0.014
e	0.650TYP.		0.026TYP.	
L	0.174	0.326	0.007	0.013

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