

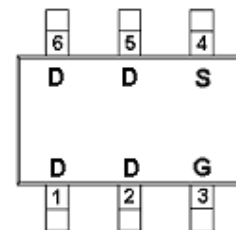
## ➤ General Description

This PAP2093WC P-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

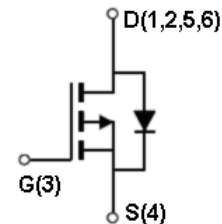
- Super high density cell design for extremely low  $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- TSOP-6 package design

## ➤ TSOP-6



## ➤ Application

- Load Switch
- PA Switch
- Battery Switch



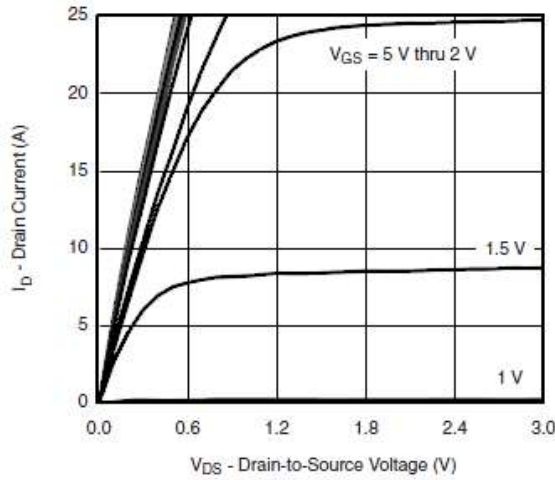
## ➤ Absolute Maximum Ratings

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DSS}$	-20	V
Gate –Source Voltage	$V_{GSS}$	$\pm 12$	V
Continuous Drain Current( $T_J=150^{\circ}C$ )	$I_D$	$T_A=25^{\circ}C$	-7.3
		$T_A=70^{\circ}C$	-5.8
Pulsed Drain Current	$I_{DM}$	-25	A
Continuous Source Current(Diode Conduction)	$I_S$	-1.7	A
Power Dissipation	$P_D$	$T_A=25^{\circ}C$	2.0
		$T_A=70^{\circ}C$	1.3
Operating Junction Temperature	$T_J$	150	$^{\circ}C$
Storage Temperature Range	$T_{STG}$	-55/150	$^{\circ}C$
Thermal Resistance-Junction to Ambient	$R_{\theta JA}$	120	$^{\circ}C/W$

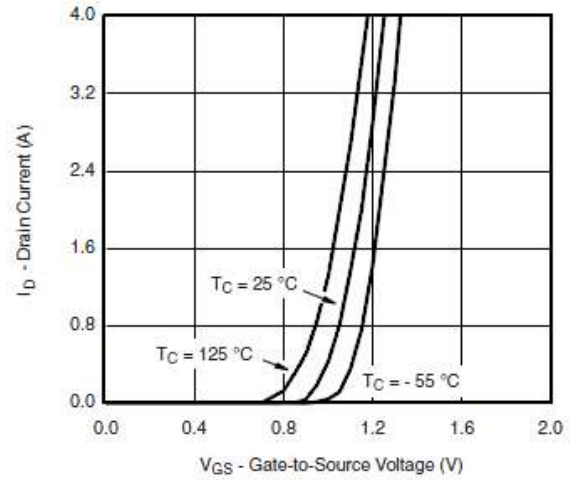
#### ➤ Electrical Characteristics (T<sub>A</sub>=25°C Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-20			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.4		-0.9	V
Gate Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 12V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=-16V, V_{GS}=0V$			-1	uA
		$V_{DS}=-16V, V_{GS}=0V$ $T_J=85^\circ C$			-10	
On-State Drain Current	$I_{D(on)}$	$V_{DS} \geq -5V, V_{GS}=-4.5V$	-25			A
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=-4.5V, I_D=-7.3A$		20	28	mΩ
		$V_{GS}=-2.5V, I_D=-4.0A$		22	32	
		$V_{GS}=-1.8V, I_D=-2.2A$		26	36	
Forward Transconductance	$g_{FS}$	$V_{DS}=-10V, I_D=-7.0A$		24		S
Diode Forward Voltage	$V_{SD}$	$I_S=-1.0A, V_{GS}=0V$		-0.75	-1.3	V
<b>Dynamic</b>						
Total Gate Charge	$Q_g$	$V_{DS}=-10V, V_{GS}=-4.5V$ $I_D=-7.0A$		25	40	nC
Gate-Source Charge	$Q_{gs}$			1.6		
Gate-Drain Charge	$Q_{gd}$			7.2		
Input Capacitance	$C_{iss}$	$V_{DS}=-10V, V_{GS}=0V$ $f=1MHz$		1800		pF
Output Capacitance	$C_{oss}$			290		
Reverse Transfer Capacitance	$C_{riss}$			250		
Turn-On Time	$t_{d(on)}$	$V_{DD}=-10V, R_L=2.0\Omega$ $I_D=-5.0A, V_{GEN}=-4.5V$ $R_G=1\Omega$		25	50	us
	$t_r$			75	145	
Turn-Off Time	$t_{d(off)}$			75	145	
	$t_f$			85	160	

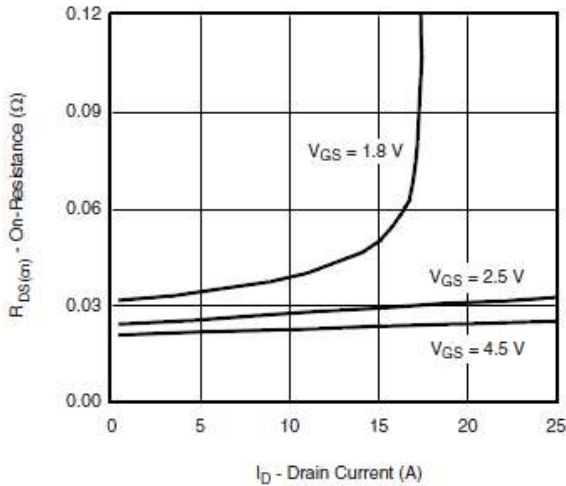
## ➤ Typical Characteristics



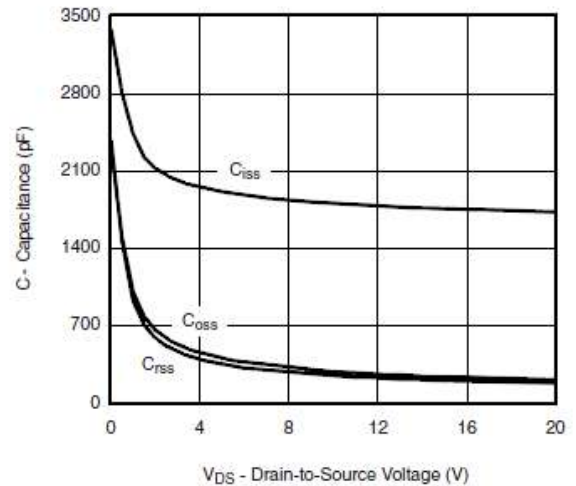
**Output Characteristics**



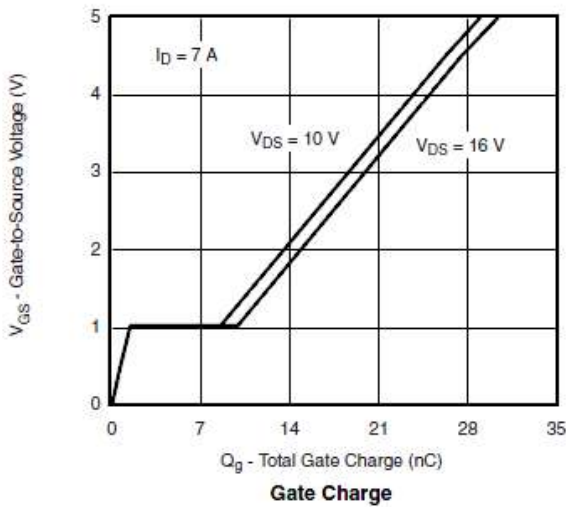
**Transfer Characteristics**



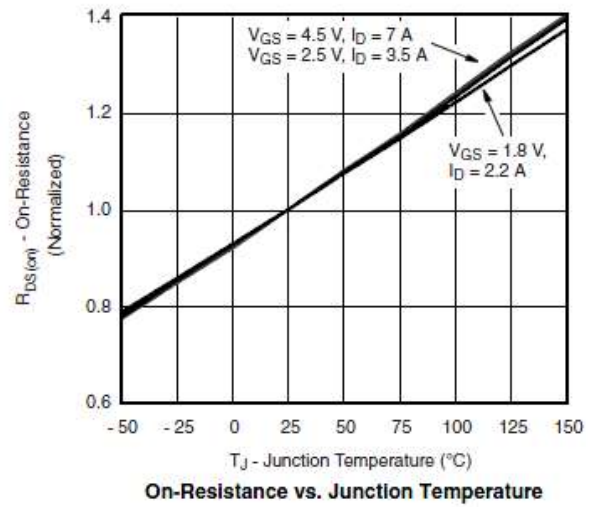
**On-Resistance vs. Drain Current and Gate Voltage**



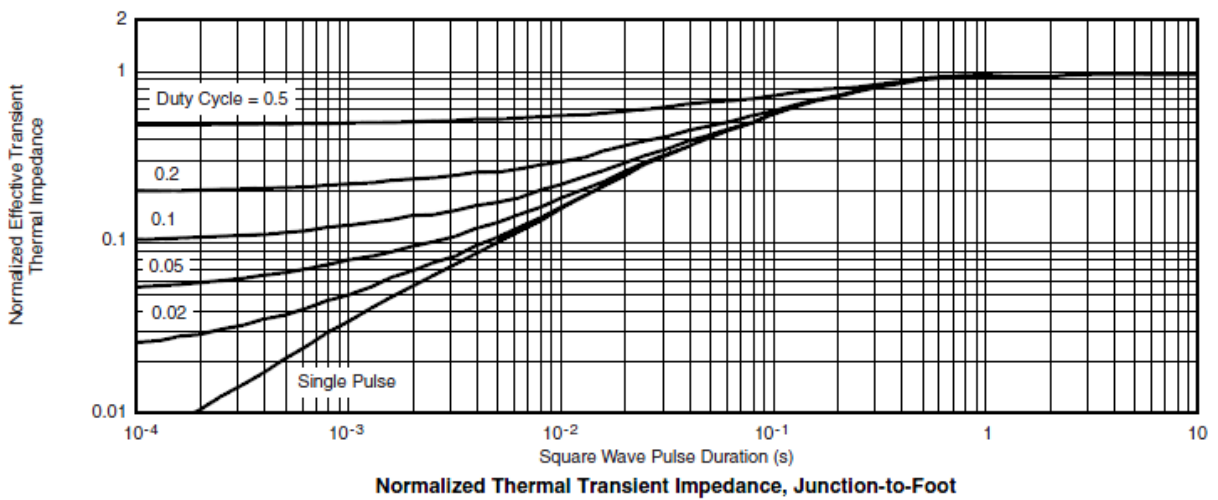
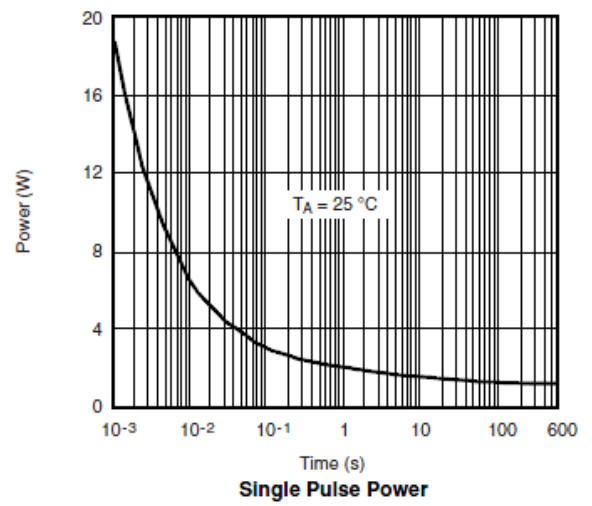
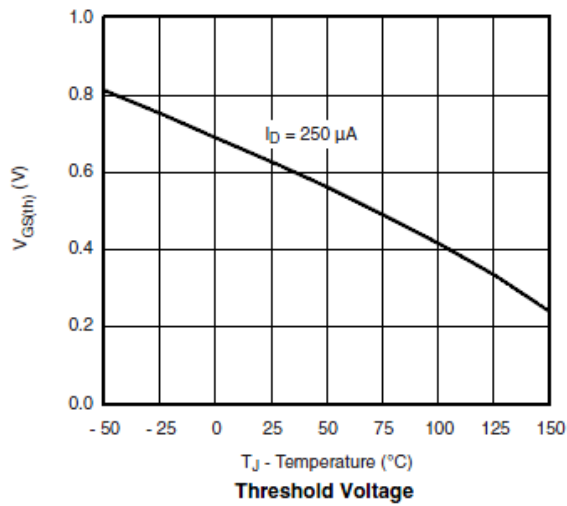
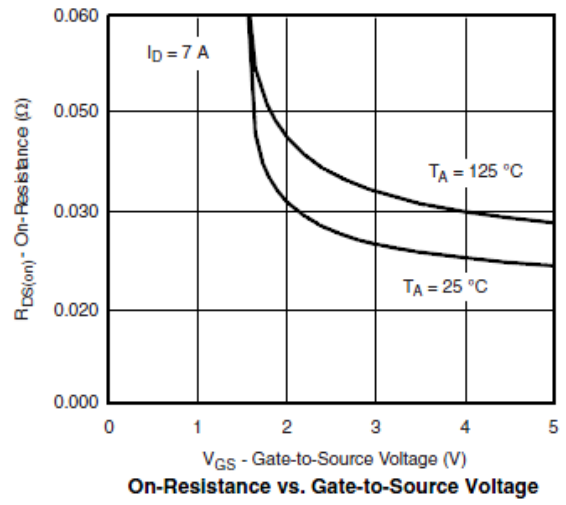
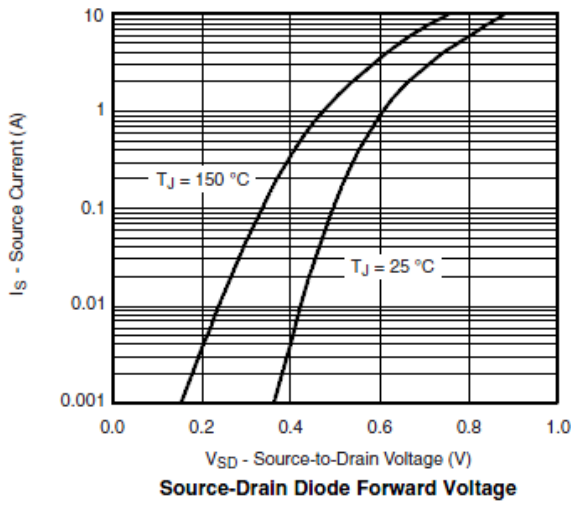
**Capacitance**



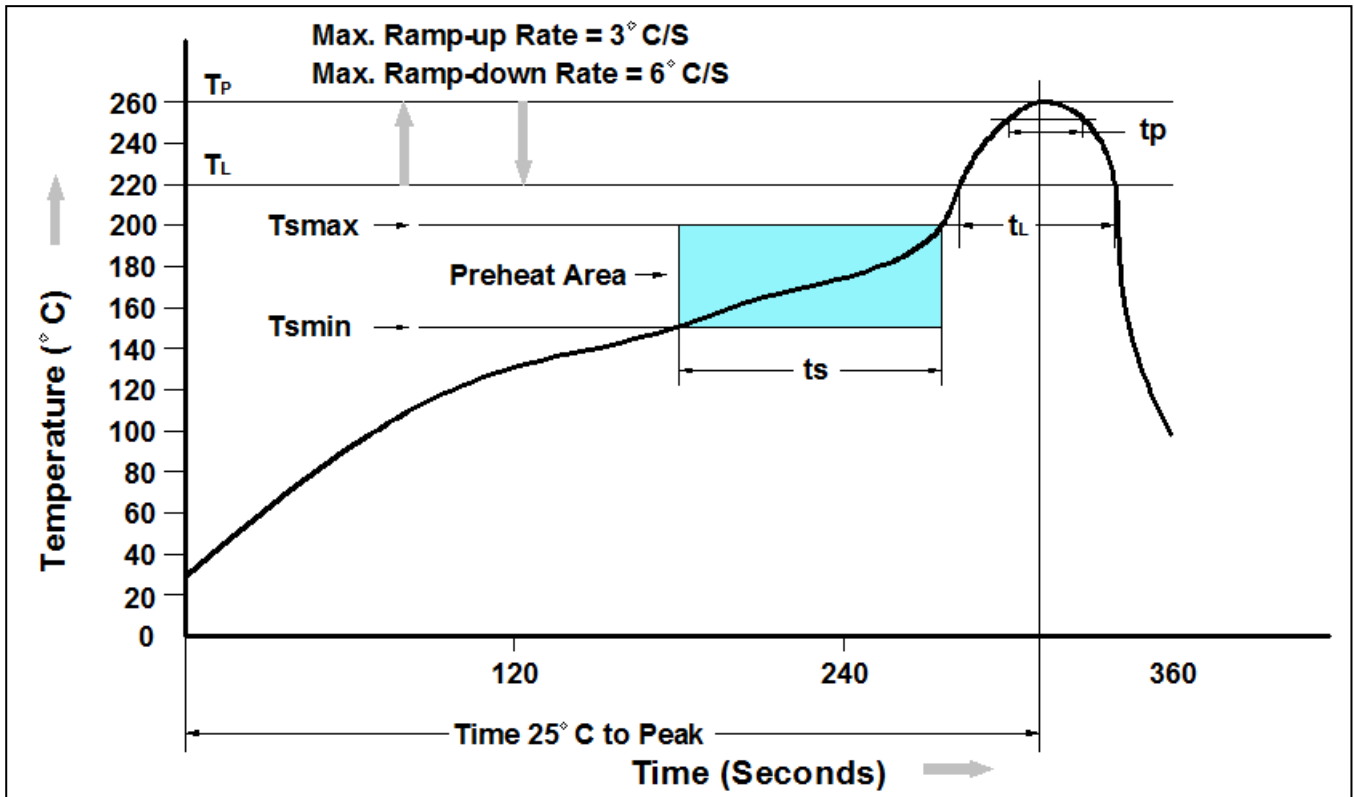
**Gate Charge**



**On-Resistance vs. Junction Temperature**



➤ Recommend IR Reflow Soldering Thermal Profile

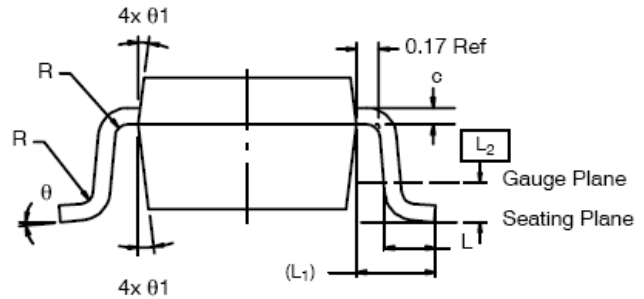
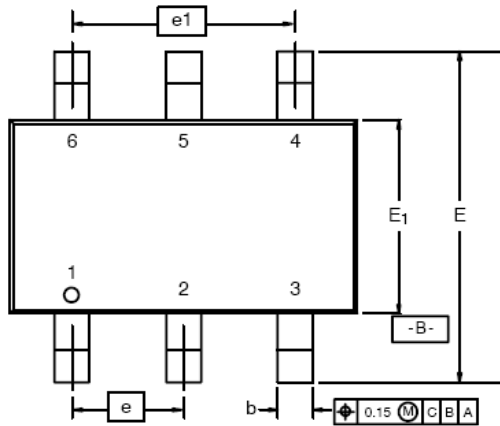


Profile Feature	Pb-Free Assembly Profile
Temperature Min. (T <sub>smin</sub> )	150°C
Temperature Max. (T <sub>smax</sub> )	200°C
Time (t <sub>s</sub> ) from (T <sub>smin</sub> to T <sub>smax</sub> )	60-120 seconds
Average Ramp-up Rate (t <sub>L</sub> to t <sub>P</sub> )	3°C/second max.
Liquidous Temperature (T <sub>L</sub> )	217°C
Time (t <sub>L</sub> ) Maintained Above (T <sub>L</sub> )	60 – 150 seconds
Peak Temperature	260°C +0°C / -5°C
Time (t <sub>P</sub> ) within 5°C of actual Peak Temperature	30 seconds
Ramp-down Rate (T <sub>P</sub> to T <sub>L</sub> )	6°C/second max
Time 25°C to Peak Temperature	8 minutes max.

➤ Ordering Information

Part Number	Description	Quantity
PAP2093WC	TSOP-6 Reel	3000 pcs

## ➤ Package Information (TSOP-6)



Dim	MILLIMETERS			INCHES		
	Min	Nom	Max	Min	Nom	Max
A	0.91	-	1.10	0.036	-	0.043
A <sub>1</sub>	0.01	-	0.10	0.0004	-	0.004
A <sub>2</sub>	0.90	-	1.00	0.035	0.038	0.039
b	0.30	0.32	0.45	0.012	0.013	0.018
c	0.10	0.15	0.20	0.004	0.006	0.008
D	2.95	3.05	3.10	0.116	0.120	0.122
E	2.70	2.85	2.96	0.106	0.112	0.117
E <sub>1</sub>	1.55	1.65	1.70	0.061	0.065	0.067
e	1.00 BSC			0.0394 BSC		
e <sub>1</sub>	1.90	2.00	2.10	0.075	0.080	0.085
L	0.35	-	0.50	0.014	-	0.020
L <sub>1</sub>	0.60 Ref			0.024 Ref		
L <sub>2</sub>	0.25 BSC			0.010 BSC		
R	0.10	-	-	0.004	-	-
θ	0°	4°	8°	0°	4°	8°
θ <sub>1</sub>	7° Nom			7° Nom		

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