

### Features

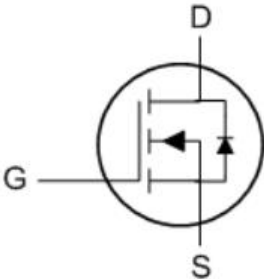
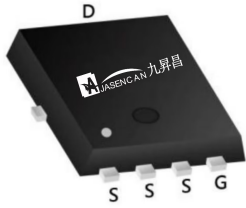
- Super Low Gate Charge
- 100% EAS Guaranteed
- Green Device Available
- Excellent CdV/dt effect decline
- Advanced high cell density Trench technology

BVDSS		30	V
ID@VGS= 10V , TC=25°C		100	A
RDS(on)(MAX)	VGS = 10 V , ID = 30 A	2.8	mΩ
	VGS = 4.5 V , ID = 20 A	6	

### Description

The **JSA3092** is the high cell density trenched N-Ch MOSFETs, which provide excellent RDS(on) and gate charge for most of the synchronous buck converter applications.

The **JSA3092** meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

Equivalent Circuit	Outline
	<p><b>PRPAK5×6</b></p> 

### Package Marking and Ordering Information

Device Marking	Date Code	Device Package	Quantity
A3092	YWWXXX	PRPAK5×6	5000 pcs

### Thermal Characteristic

Symbol	Parameter	Value	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient <sup>1</sup>	30	°C/W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient <sup>1</sup> (t≤10s)	25	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-Case <sup>1</sup>	2.2	°C/W

### Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
$V_{DS}$	Drain-Source Voltage	30	V
$V_{GS}$	Gate-Source Voltage	±20	V
$I_D$	Continuous Drain Current, $V_{GS}$ @ 10V <sup>1</sup> (T <sub>C</sub> =25°C)	100	A
	Continuous Drain Current, $V_{GS}$ @ 10V <sup>1</sup> (T <sub>C</sub> =100°C)	63	
	Continuous Drain Current, $V_{GS}$ @ 10V <sup>1</sup> (T <sub>A</sub> =25°C)	27	
	Continuous Drain Current, $V_{GS}$ @ 10V <sup>1</sup> (T <sub>A</sub> =70°C)	22	
$I_{DM}$	Pulsed Drain Current <sup>2</sup>	400	A
$P_D$	Total Power Dissipation <sup>4</sup> (T <sub>C</sub> =25°C)	57	W
	Total Power Dissipation <sup>4</sup> (T <sub>C</sub> =100°C)	23	
	Total Power Dissipation <sup>4</sup> (T <sub>A</sub> =25°C)	4.2	
	Total Power Dissipation <sup>4</sup> (T <sub>A</sub> =70°C)	2.7	
$E_{AS}$	Single Pulse Avalanche Energy <sup>3</sup>	135	mJ
$I_{AS}$	Avalanche Current	52	A
$T_J, T_{STG}$	Operating Junction and Storage Temperature Range	-55 To 150	°C

### Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise noted)

Staic Characteristics						
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	30			V
$R_{DS(ON)}$	Drain-Source On-State Resistance <sup>2</sup>	$V_{GS} = 10V, I_D = 30A$		2.2	2.8	mΩ
		$V_{GS} = 4.5V, I_D = 20A$		4	6	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS} = V_{DS}, I_D = 250\mu A$	1.2		2.5	V
$I_{DSS}$	Drain-Source Leakage Current (T <sub>J</sub> =25°C)	$V_{DS} = 24V, V_{GS} = 0V$			1	μA
	Drain-Source Leakage Current (T <sub>J</sub> =55°C)	$V_{DS} = 24V, V_{GS} = 0V$			5	
$I_{GSS}$	Gate-Body Leakage Current	$V_{GS} = \pm 20V, V_{DS} = 0V$			±100	nA

Dynamic Characteristics						
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$C_{iss}$	Input Capacitance	$V_{DS} = 25\text{ V}$		3580		pF
$C_{oss}$	Output Capacitance	$V_{GS} = 0\text{ V}$		358		pF
$C_{rss}$	Reverse Transfer Capacitance	$f=1.0\text{ MHz}$		305		pF
Switching Times						
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$t_{d(on)}$	Turn-On Delay Time	$V_{DD} = 20\text{ V}$		13		nS
$t_r$	Turn-On Rise Time	$V_{GS} = 10\text{ V}$		115		nS
$t_{d(off)}$	Turn-Off Delay Time	$R_G = 3\ \Omega$		23		nS
$t_f$	Turn-Off Fall Time	$I_D = 20\text{ A}$		58		nS
$Q_g$	Total Gate Charge (10 V)	$V_{DS} = 15\text{ V}$		63		nC
$Q_{gs}$	Gate-Source Charge	$V_{GS} = 10\text{ V}$		9		nC
$Q_{gd}$	Gate-Drain Charge	$I_D = 20\text{ A}$		13.5		nC

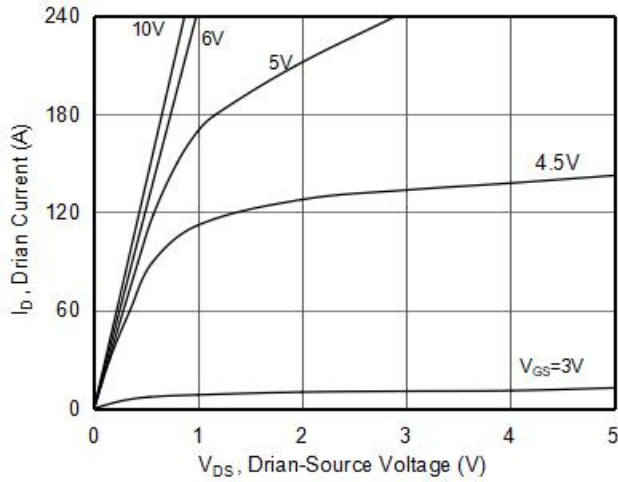
### Source-Drain Diode Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$I_S$	Continuous Source Current <sup>1,5</sup>	$V_G=V_D=0\text{ V}$ , Force Current			100	A
$I_{SM}$	Pulsed Source Current <sup>2,5</sup>				400	A
$V_{SD}$	Diode Forward Voltage <sup>2</sup>	$I_S = 1\text{ A}$ , $V_{GS}=0\text{ V}$ , $T_J=25\text{ }^\circ\text{C}$			1.2	V
$t_{rr}$	Reverse Recovery Time	$I_F = 20\text{ A}$ , $dI/dt = 100\text{ A}/\mu\text{s}$ ,		51		nS
$Q_{rr}$	Reverse Recovery Charge	$T_J=25\text{ }^\circ\text{C}$		92		nC

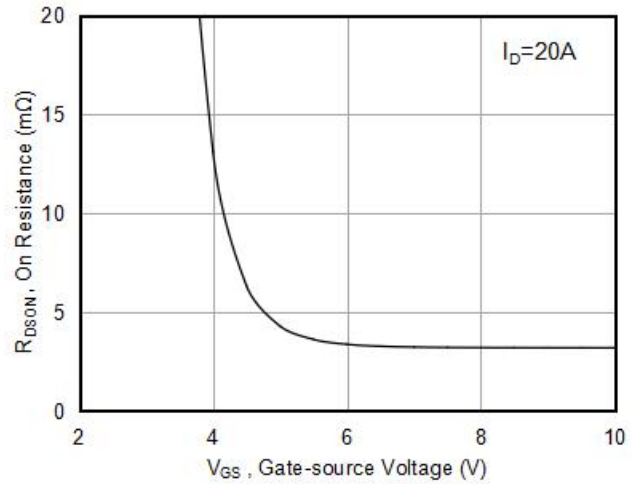
### Notes:

1. The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper.
2. The data tested by pulsed : Pulse Width  $\leq 300\mu\text{s}$  , Duty Cycle  $\leq 2\%$ .
3. The  $E_{AS}$  data shows Max. rating . The test condition is  $V_{DD} = 25\text{ V}$  ,  $V_{GS} = 10\text{ V}$  ,  $L = 0.1\text{ mH}$  ,  $I_{AS} = 52\text{ A}$ .
4. The power dissipation is limited by 150<sup>o</sup>C junction temperature.
5. The data is theoretically the same as  $I_D$  and  $I_{DM}$  , in real applications , should be limited by total power dissipation.

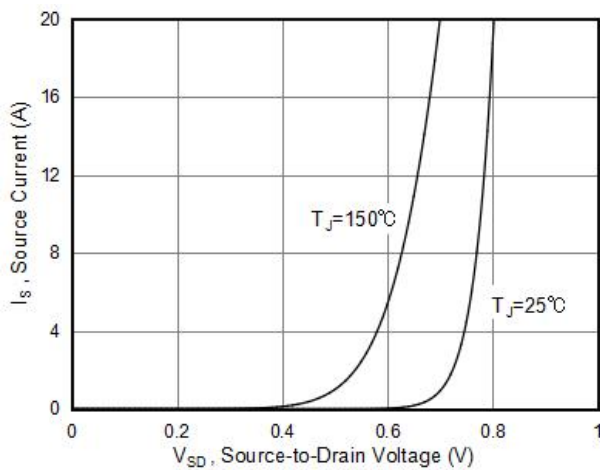
### Typical Characteristics



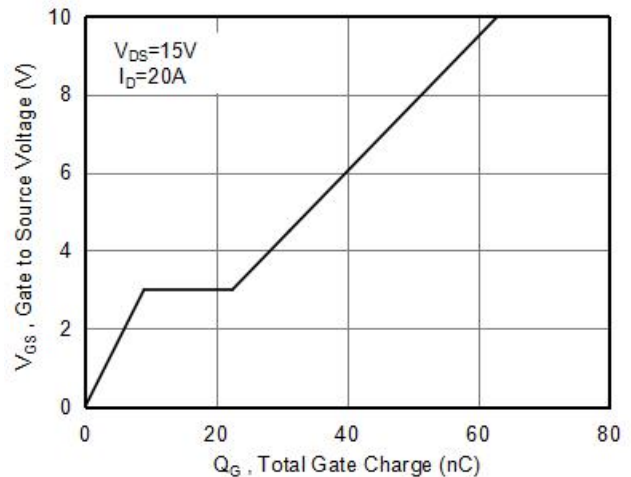
**Fig.1 Typical Output Characteristics**



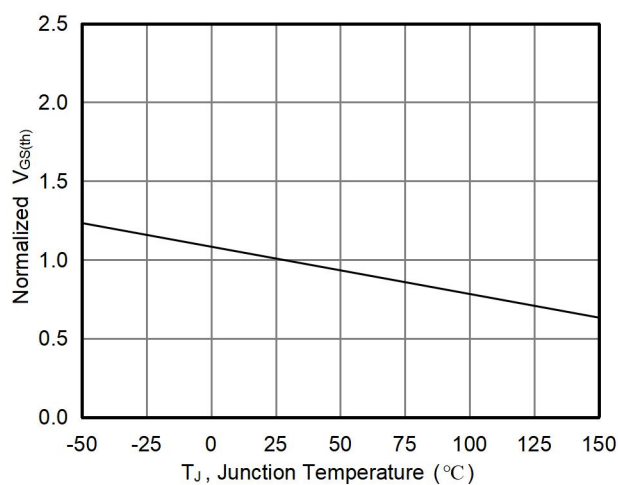
**Fig.2 On-Resistance vs. G-S Voltage**



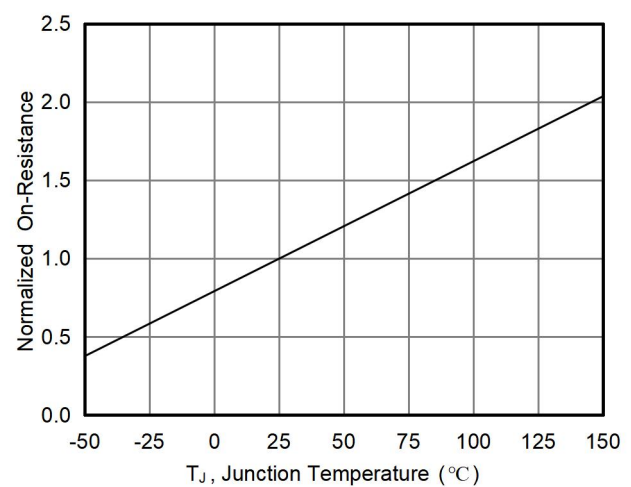
**Fig.3 Forward Characteristics Of Reverse**



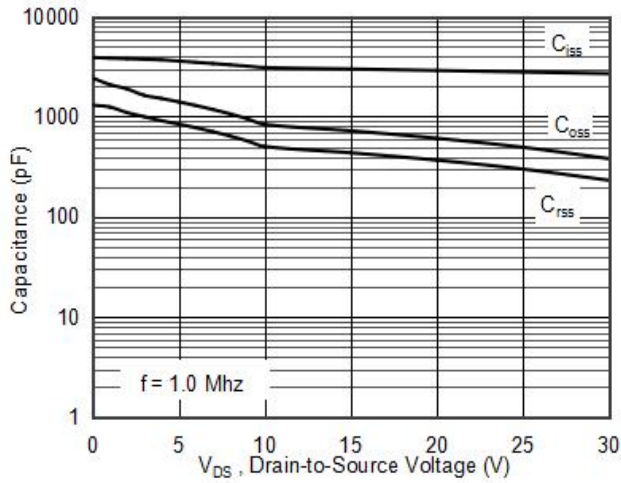
**Fig.4 Gate-Charge Characteristics**



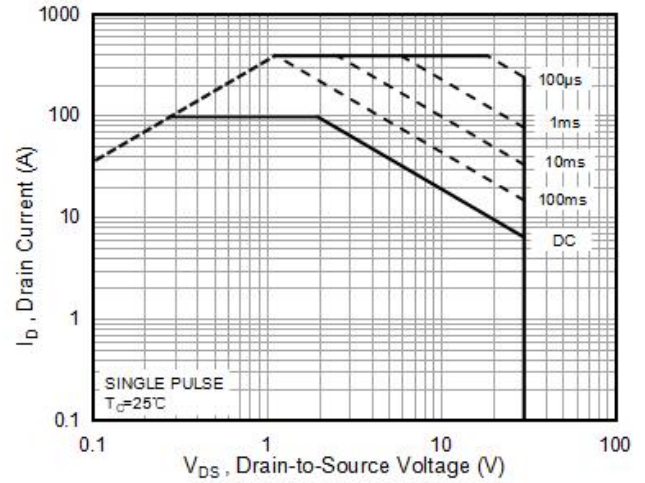
**Fig.5 Normalized  $V_{GS(th)}$  vs.  $T_J$**



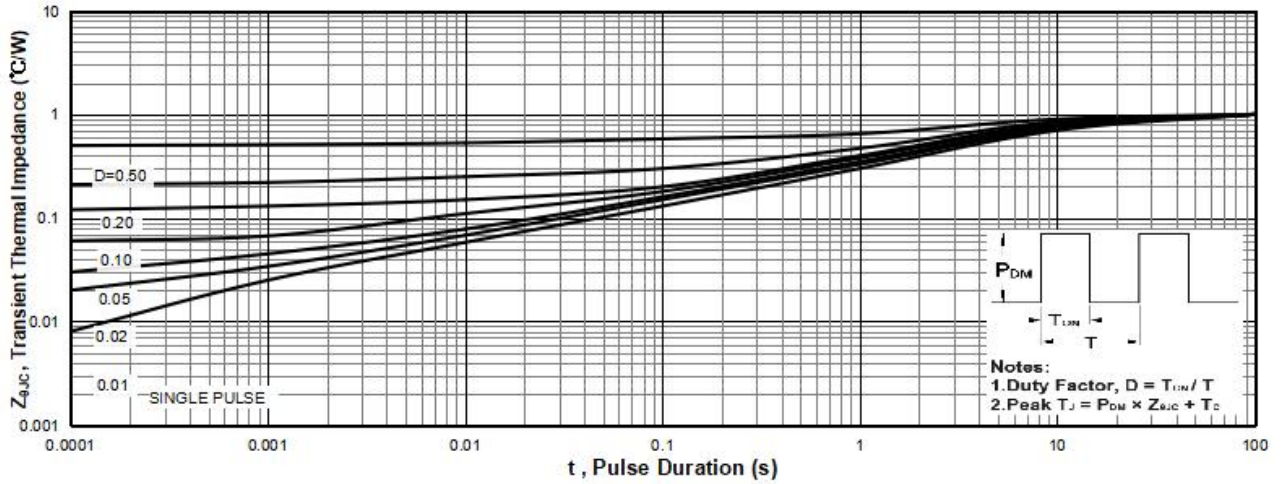
**Fig.6 Normalized  $R_{DS(on)}$  vs.  $T_J$**



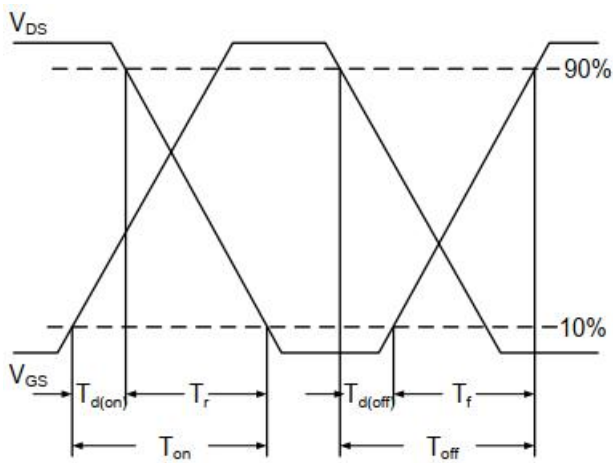
**Fig.7 Capacitance**



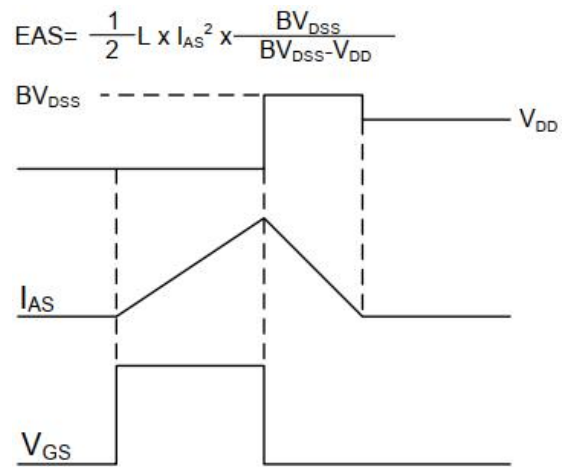
**Fig.8 Safe Operating Area**



**Fig.9 Normalized Maximum Transient Thermal Impedance**

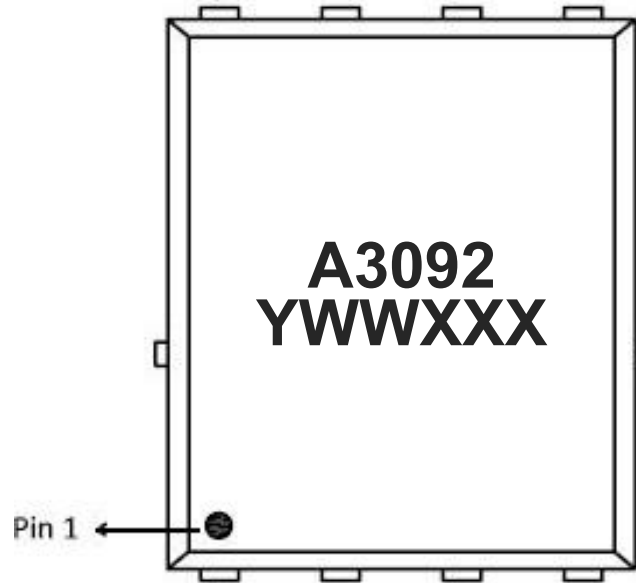


**Fig.10 Switching Time Waveform**



**Fig.11 Unclamped Inductive Switching Waveform**

## Marking Information



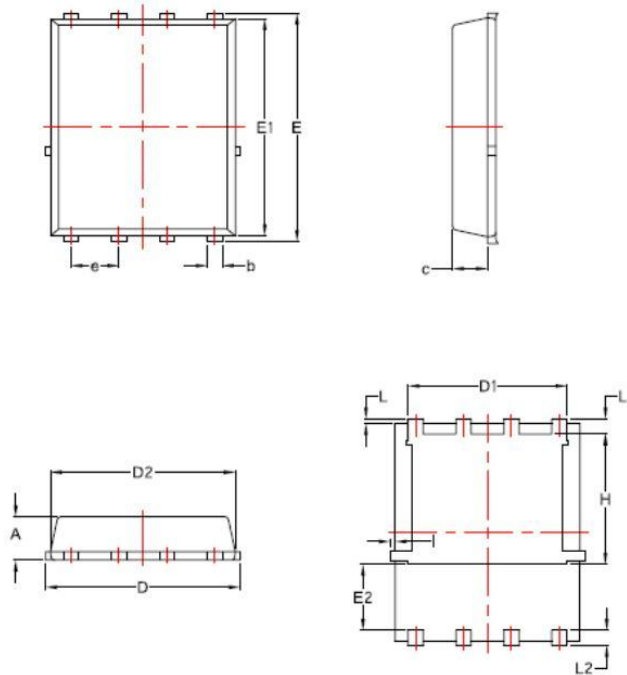
**1 st line:** HuaYuanWei Logo (left)

**2 nd line:** Device Package, Part Number, Channel and Version

**3 rd line:** Date Code [ Y WW XX X ]

- ① **Y** : Year (2021=M, 2022=N.....)
- ② **WW** : Week (01-53)
- ③ **XX** : Serial Number (01-99, AA-ZZ)
- ④ **X** : Factory Code (A-Z)

## PRPAK5×6 Package Outline



SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.90	1.20	0.0354	0.0474
b	0.30	0.51	0.0118	0.0200
c	0.60	1.046	0.0236	0.0412
D1	4.11	4.31	0.1618	0.1697
D2	4.80	5.20	0.1890	0.2047
E	5.90	6.35	0.2323	0.2500
E1	5.65	6.06	0.2224	0.2386
E2	1.10	-	0.0433	-
e	1.27 BSC		0.05 BSC	
L	0.05	0.25	0.0020	0.0098
L1	0.38	0.61	0.0150	0.0240
L2	0.30	0.71	0.0118	0.0280
H	3.30	3.92	0.1300	0.1543
I	-	0.18	-	0.0070