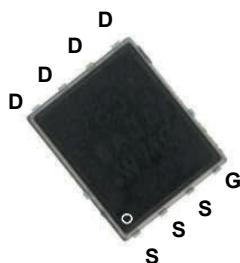
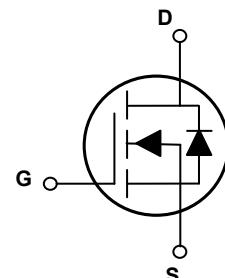


### Main Product Characteristics

V <sub>DS</sub>	120V
I <sub>D</sub>	80A
R <sub>DS(ON)</sub> (Max.)	7mΩ @ V <sub>GS</sub> =10V



PPAK5x6



Schematic Diagram

### Features and Benefits

- Advanced MOSFET process technology
- Ideal for high efficiency switched mode power supplies
- Low on-resistance with low gate charge
- Fast switching and reverse body recovery



### Description

The GSFP12R08 utilizes the latest techniques to achieve high cell density and low on-resistance. These features make this device extremely efficient and reliable for use in high efficiency switch mode power supplies and a wide variety of other applications.

### Absolute Maximum Ratings (T<sub>J</sub>=25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain Source Voltage	V <sub>DS</sub>	120	V
Gate Source Voltage	V <sub>GS</sub>	±20	V
Continuous Drain Current, T <sub>C</sub> =25°C <sup>1</sup>	I <sub>D</sub>	80	A
Pulsed Drain Current, T <sub>C</sub> =25°C <sup>2</sup>	I <sub>D</sub> , pulse	240	A
Continuous Diode Forward Current, T <sub>C</sub> =25°C <sup>1</sup>	I <sub>S</sub>	80	A
Diode Pulsed Current, T <sub>C</sub> =25°C <sup>2</sup>	I <sub>S</sub> , pulse	240	A
Power Dissipation, T <sub>C</sub> =25°C <sup>3</sup>	P <sub>D</sub>	106	W
Single Pulsed Avalanche Energy <sup>5</sup>	E <sub>AS</sub>	60	mJ
Operation and Storage Temperature	T <sub>stg</sub> , T <sub>J</sub>	-55 to 150	°C
Thermal Resistance, Junction-Case	R <sub>θJC</sub>	1.18	°C/W
Thermal Resistance, Junction-Ambient <sup>4</sup>	R <sub>θJA</sub>	62	°C/W

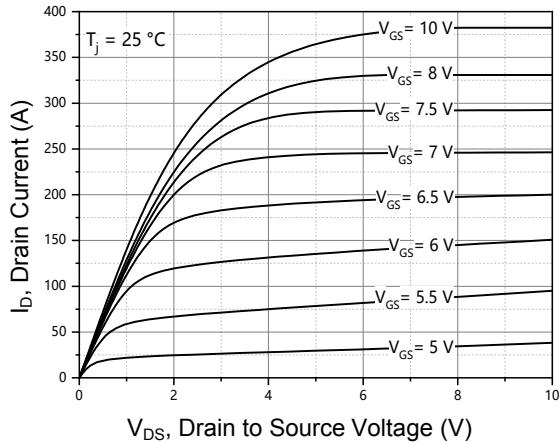
**Electrical Characteristics** ( $T_J=25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Test condition	Min.	Typ.	Max.	Unit
<b>On / Off Characteristics</b>						
Drain-Source Breakdown Voltage	$\text{BV}_{\text{DSS}}$	$V_{\text{GS}}=0\text{V}, I_{\text{D}}=250\mu\text{A}$	120	-	-	V
Gate Threshold Voltage	$V_{\text{GS(th)}}$	$V_{\text{DS}}=V_{\text{GS}}, I_{\text{D}}=250\mu\text{A}$	2.5	-	4.0	V
Drain-Source On-state Resistance	$R_{\text{DS(ON)}}$	$V_{\text{GS}}=10\text{V}, I_{\text{D}}=20\text{A}$	-	5.5	7.0	$\text{m}\Omega$
Gate-Source Leakage Current	$I_{\text{GSS}}$	$V_{\text{GS}}=20\text{V}$	-	-	100	$\text{nA}$
		$V_{\text{GS}}=-20\text{V}$	-	-	-100	
Drain-to-Source Leakage Current	$I_{\text{DSS}}$	$V_{\text{DS}}=120\text{V}, V_{\text{GS}}=0\text{V}$	-	-	1	$\mu\text{A}$
<b>Dynamic and Switching Characteristics</b>						
Input Capacitance	$C_{\text{iss}}$	$V_{\text{GS}}=0\text{V}, V_{\text{DS}}=25\text{V}, F=100\text{kHz}$	-	5305	-	$\text{pF}$
Output Capacitance	$C_{\text{oss}}$		-	1547	-	$\text{pF}$
Reverse Transfer Capacitance	$C_{\text{rss}}$		-	170	-	$\text{pF}$
Turn-on Delay Time	$t_{\text{d(on)}}$	$V_{\text{GS}}=10\text{V}, V_{\text{DS}}=60\text{V}, R_{\text{G}}=2\Omega, I_{\text{D}}=30\text{A}$	-	33.2	-	ns
Rise Time	$t_{\text{r}}$		-	47	-	ns
Turn-off Delay Time	$t_{\text{d(off)}}$		-	59.2	-	ns
Fall Time	$t_{\text{f}}$		-	13	-	ns
Total Gate Charge	$Q_{\text{g}}$	$V_{\text{GS}}=10\text{V}, V_{\text{DS}}=60\text{V}, I_{\text{D}}=30\text{A}$	-	73.6	-	$\text{nC}$
Gate-Source Charge	$Q_{\text{gs}}$		-	23.5	-	$\text{nC}$
Gate-Drain Charge	$Q_{\text{gd}}$		-	17.5	-	$\text{nC}$
Gate Plateau Voltage	$V_{\text{plateau}}$		-	5.1	-	V
Gate Resistance	$R_{\text{g}}$	$F=1\text{MHz}, \text{Open Drain}$	-	2.6	-	$\Omega$
<b>Source-Drain Ratings and Characteristics</b>						
Diode Forward Voltage	$V_{\text{SD}}$	$I_{\text{S}}=20\text{A}, V_{\text{GS}}=0\text{V}$	-	-	1.3	V
Reverse Recovery Time	$T_{\text{rr}}$	$V_{\text{R}}=80\text{V}, I_{\text{S}}=30\text{A}, \text{di/dt}=100\text{A}/\mu\text{s}$	-	73.6	-	ns
Reverse Recovery Charge	$Q_{\text{rr}}$		-	160	-	$\text{nC}$
Peak Reverse Recovery Current	$I_{\text{rrm}}$		-	3.8	-	A

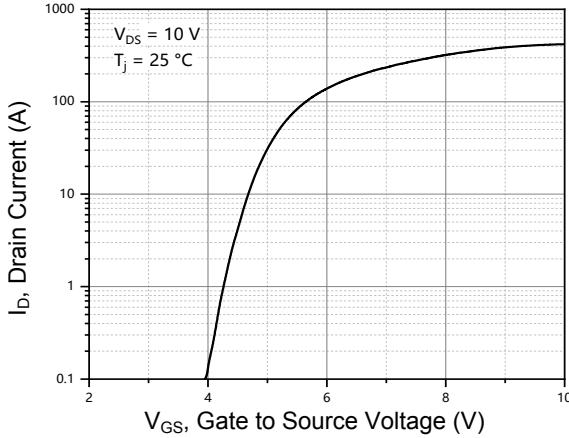
Note:

- Calculated continuous current based on maximum allowable junction temperature.
- Repetitive rating; pulse width limited by max. junction temperature.
- $P_{\text{d}}$  is based on max. junction temperature, using junction-case thermal resistance.
- The value of  $R_{\theta\text{JA}}$  is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz. copper, in a still air environment with  $T_A=25^\circ\text{C}$ .
- $V_{\text{DD}}=50\text{V}, V_{\text{GS}}=10\text{V}, L=0.3\text{mH}$ , starting  $T_J=25^\circ\text{C}$ .

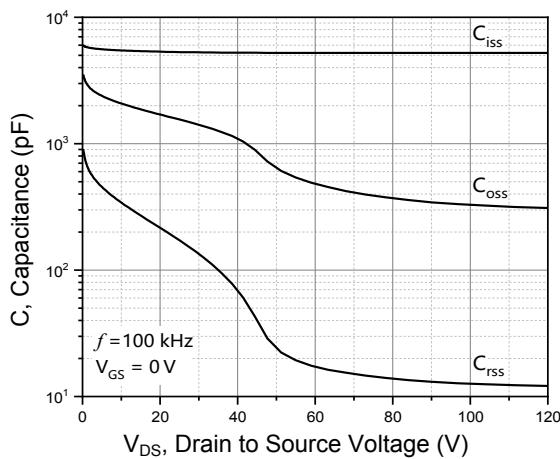
## Typical Electrical and Thermal Characteristic Curves



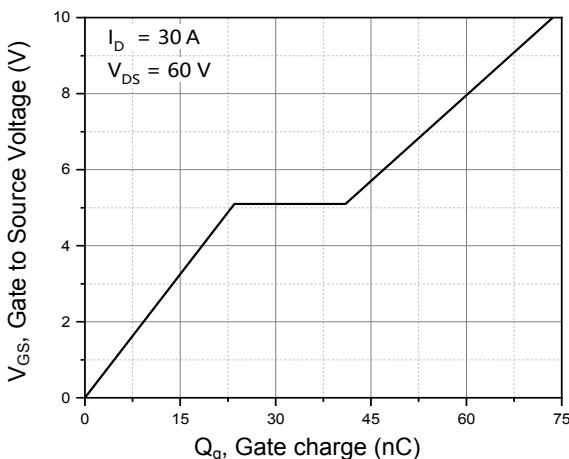
**Figure 1. Typical Output Characteristics**



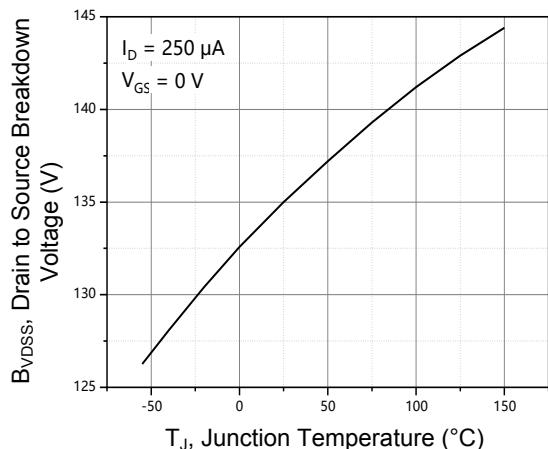
**Figure 2. Typical Transfer Characteristics**



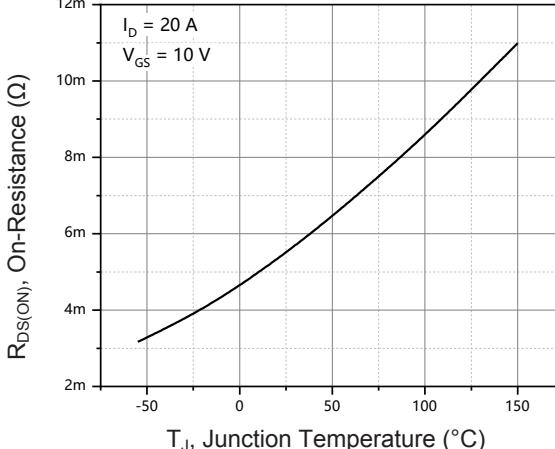
**Figure 3. Typical Capacitances**



**Figure 4. Typical Gate Charge**



**Figure 5. Drain to Source Breakdown Voltage**



**Figure 6. Drain to Source On-State Resistance**

## Typical Electrical and Thermal Characteristic Curves

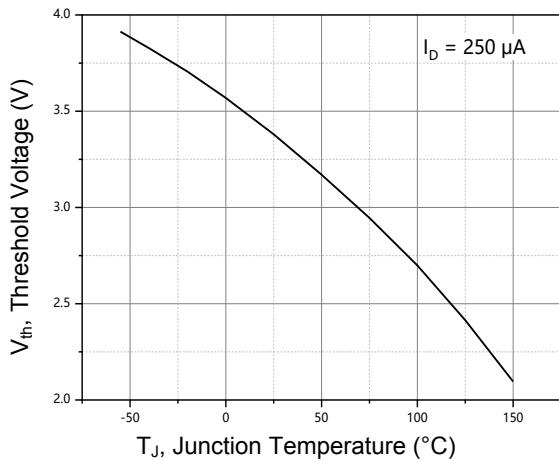


Figure 7. Threshold Voltage

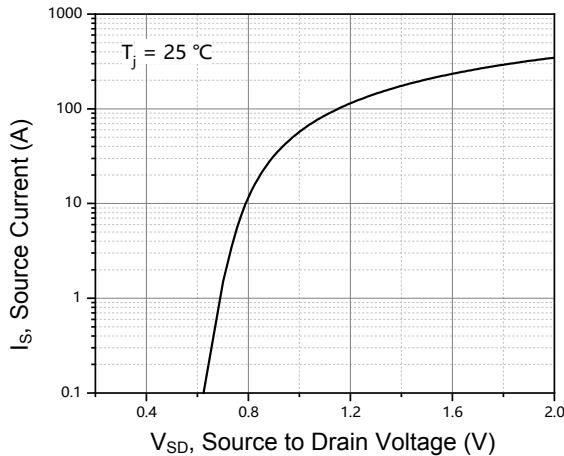


Figure 8. Forward Characteristic of Body Diode

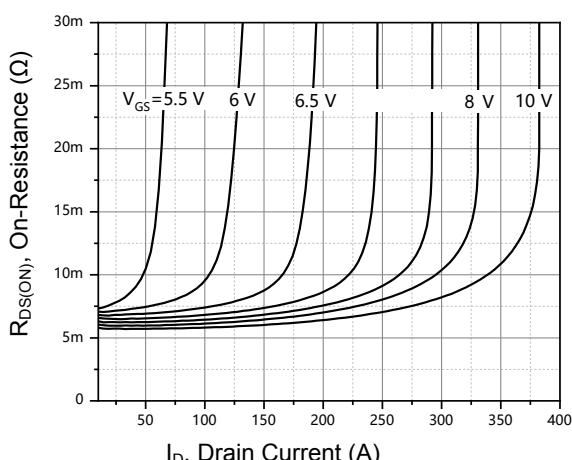


Figure 9. Drain to Source On-State Resistance

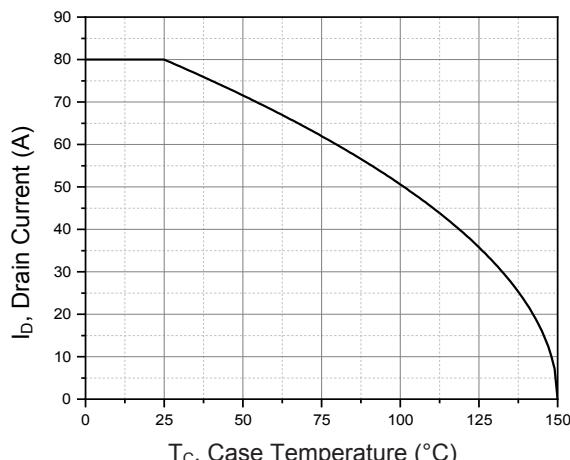


Figure 10. Drain Current

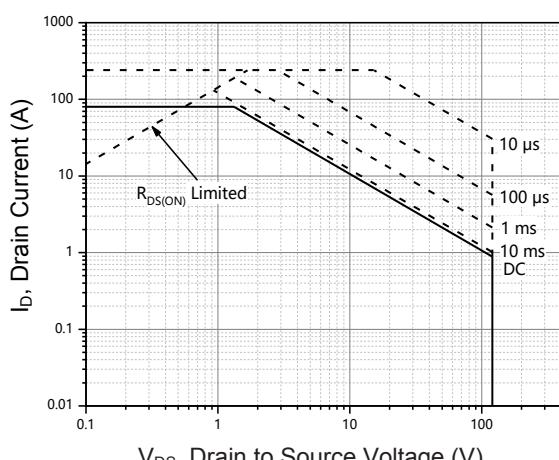


Figure 11. Safe Operation Area  $T_C=25^\circ\text{C}$

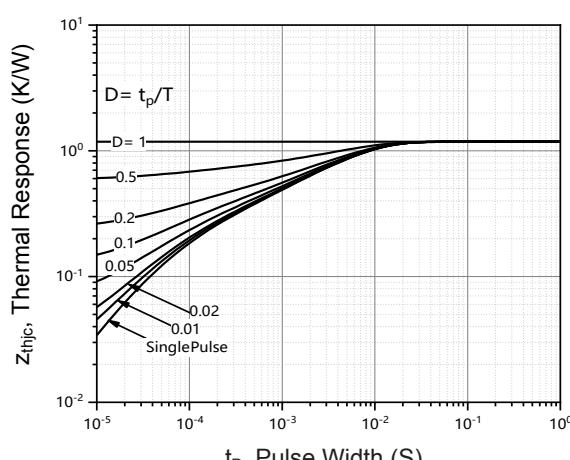
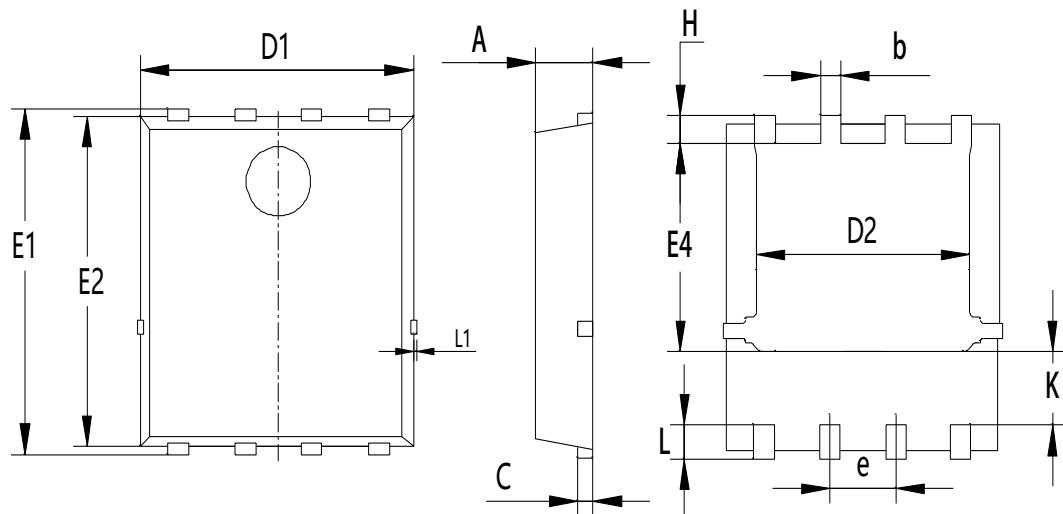


Figure 12. Max Transient Thermal Impedance

**Package Outline Dimensions (PPAK5x6-P)**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.00	1.20	0.039	0.047
b	0.30	0.50	0.012	0.020
c	0.15	0.36	0.006	0.014
D1	5.00	5.40	0.197	0.213
D2	3.80	4.25	0.150	0.167
e	1.17	1.37	0.046	0.054
E1	5.95	6.35	0.234	0.250
E2	5.66	6.06	0.223	0.239
E4	3.52	3.92	0.139	0.154
H	0.40	0.60	0.016	0.024
L	0.30	0.70	0.012	0.028
L1	0.12 REF		0.005 REF	
K	1.15	1.45	0.045	0.057