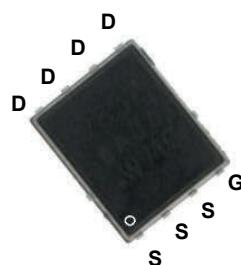
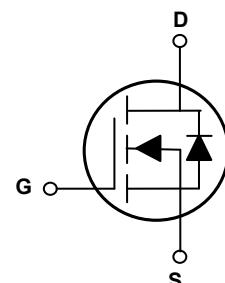


Main Product Characteristics

$V_{(BR)DSS}$	650V
$R_{DS(ON)}$	0.64Ω (Max.)
I_D	7A



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 GSFP65R640 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 ($T_C=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Parameter.	Unit
Drain-Source Voltage	V_{DS}	650	V
Gate-to-Source Voltage	V_{GS}	± 30	V
Continuous Drain Current, @ Steady-State ($T_C=25^\circ\text{C}$)	I_D	7	A
Continuous Drain Current, @ Steady-State ($T_C=100^\circ\text{C}$)		4.4	A
Pulsed Drain Current	I_{DM}	28	A
Power Dissipation ($T_C=25^\circ\text{C}$)	P_D	35	W
		0.28	W/°C
Single Pulse Avalanche Energy ¹	E_{AS}	221	mJ
Body Diode Reverse Voltage Slope ²	dv/dt	50	V/ns
MOS dv/dt Reggedness ³	dv/dt	100	V/ns
Junction-to-Ambient (PCB Mounted, Steady-State)	$R_{\theta JA}$	62.5	°C/W
Junction-to-Case	$R_{\theta JC}$	3.57	°C/W
Operating Junction and Storage Temperature Range	T_J/T_{STG}	-55 to + 150	°C

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On / Off Characteristics						
Drain-to-Source Breakdown Voltage	$V_{(\text{BR})\text{DSS}}$	$V_{\text{GS}}=0\text{V}, I_D=250\mu\text{A}$	650	-	-	V
Drain-to-Source Leakage Current	I_{DSS}	$V_{\text{DS}}=650\text{V}, V_{\text{GS}}=0\text{V}$	-	-	200	nA
Gate-to-Source Forward Leakage	I_{GSS}	$V_{\text{DS}}=0\text{V}, V_{\text{GS}}=30\text{V}$	-	-	100	nA
		$V_{\text{DS}}=0\text{V}, V_{\text{GS}}=-30\text{V}$	-	-	-100	
Static Drain-to-Source On-Resistance	$R_{\text{DS}(\text{ON})}$	$V_{\text{GS}}=10\text{V}, I_D=3.5\text{A}, T_J=25^\circ\text{C}$	-	0.54	0.64	Ω
		$V_{\text{GS}}=10\text{V}, I_D=3.5\text{A}, T_J=125^\circ\text{C}$	-	1.09	-	Ω
Gate Threshold Voltage	$V_{\text{GS}(\text{th})}$	$V_{\text{DS}}=V_{\text{GS}}, I_D=250\mu\text{A}$	2.0	-	4.0	V
Dynamic and Switching Characteristics						
Input Capacitance	C_{iss}	$V_{\text{GS}}=0\text{V}, V_{\text{DS}}=100\text{V}, f=1\text{MHz}$	-	605	-	pF
Output Capacitance	C_{oss}		-	25	-	
Reverse Transfer Capacitance	C_{rss}		-	0.8	-	
Total Gate Charge ^{4,5}	Q_g	$I_D=7\text{A}, V_{\text{DD}}=520\text{V}, V_{\text{GS}}=10\text{V}$	-	20	-	nC
Gate-to-Source Charge ^{4,5}	Q_{gs}		-	5.2	-	
Gate-to-Drain ("Miller") Charge ^{4,5}	Q_{gd}		-	8.8	-	
Turn-on Delay Time ^{4,5}	$t_{\text{d}(\text{on})}$	$V_{\text{DD}}=325\text{V}, V_{\text{GS}}=10\text{V}, R_G=25\Omega$ $I_D=7\text{A}$	-	21	-	nS
Rise Time ^{4,5}	t_r		-	39	-	
Turn-Off Delay Time ^{4,5}	$t_{\text{d}(\text{off})}$		-	90	-	
Fall Time ^{4,5}	t_f		-	36	-	
Gate Resistance	R_g	$f=1\text{MHz}$	-	4.7	-	Ω
Source-Drain Ratings and Characteristics						
Continuous Source Current (Body Diode)	I_S	$T_C=25^\circ\text{C}$, MOSFET symbol showing the integral reverse p-n junction diode.	-	-	7	A
Source Pulse Current	I_{SM}		-	-	28	A
Diode Forward Voltage	V_{SD}	$I_S=7\text{A}, V_{\text{GS}}=0\text{V}$	-	-	1.4	V
Reverse Recovery Time ³	T_{rr}	$I_F=7\text{A}, V_{\text{GS}}=0\text{V}, dI_F/dt=100\text{A}/\mu\text{s}$	-	239	-	nS
Reverse Recovery Charge ³	Q_{rr}		-	2.5	-	μC

Notes

1. $L=79\text{mH}, I_{AS}=2.2\text{A}, V_{\text{DD}}=100\text{V}$, starting temperature $T_J=25^\circ\text{C}$.
2. $V_{\text{DS}}=0\text{-}400\text{V}, I_{SD}<=20\text{A}, T_J=25^\circ\text{C}$.
3. $V_{\text{DS}}=0\text{-}480\text{V}$.
4. Pulse test : pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.
5. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristic Curves

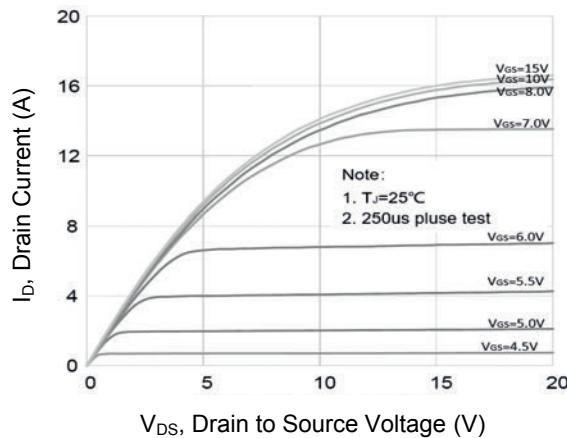


Figure 1. Typical Output Characteristics

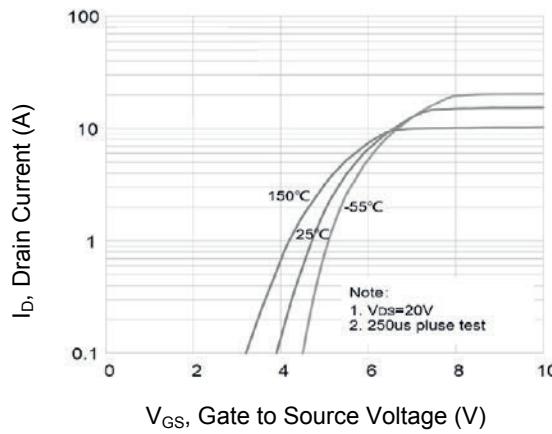


Figure 2. Transfer Characteristics

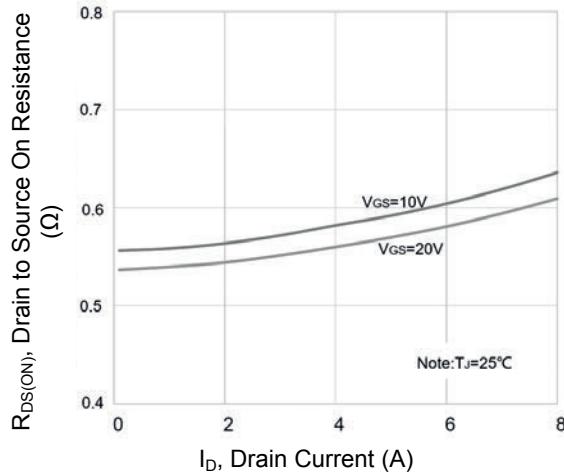


Figure 3. $R_{DS(ON)}$ Vs. Drain Current

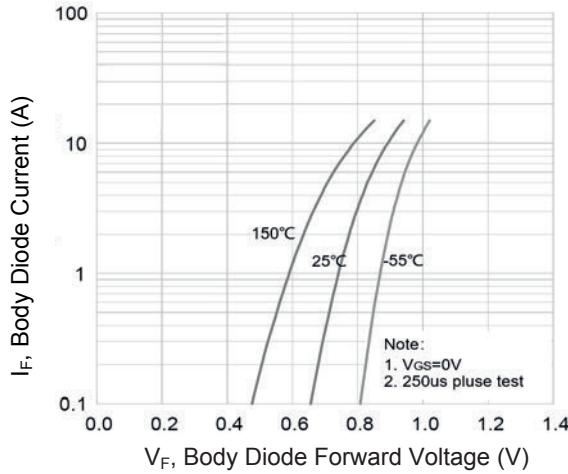


Figure 4. Body Diode Characteristics

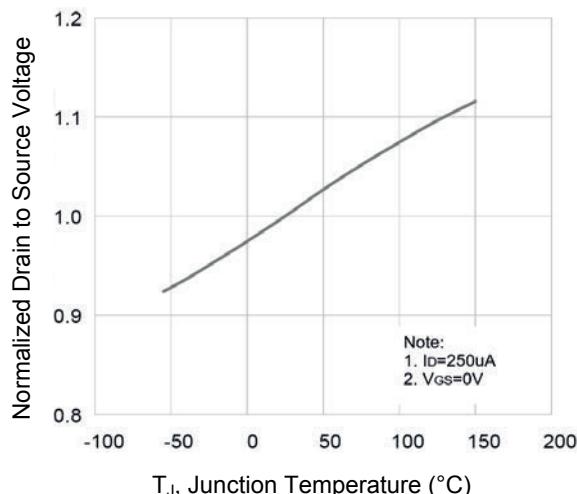


Figure 5. Normalized BV_{DSS} Vs. T_J

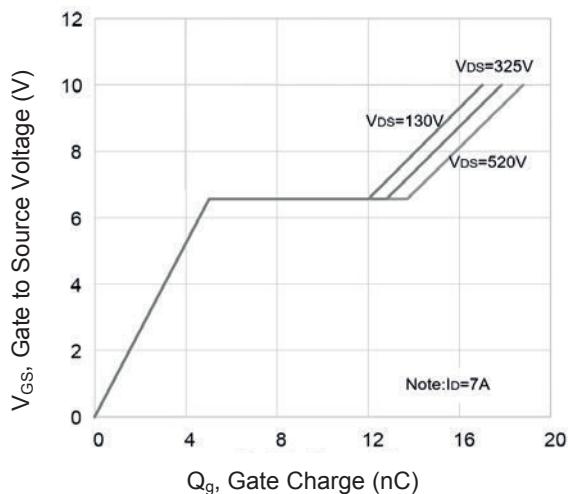


Figure 6. Gate Charge

Typical Electrical and Thermal Characteristic Curves

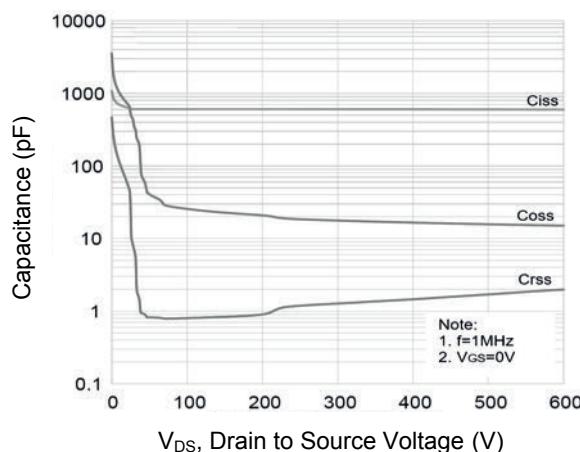


Figure 7. Capacitance Characteristics

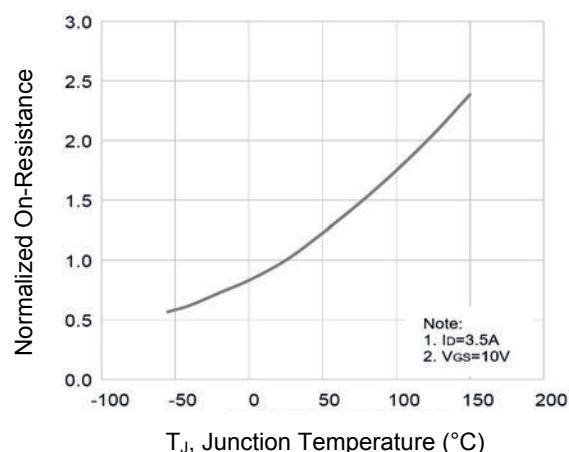


Figure 8. Normalized $R_{DS(ON)}$ Vs. T_J

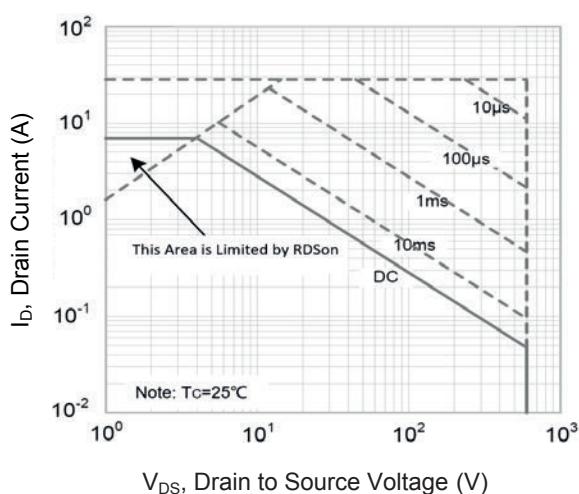
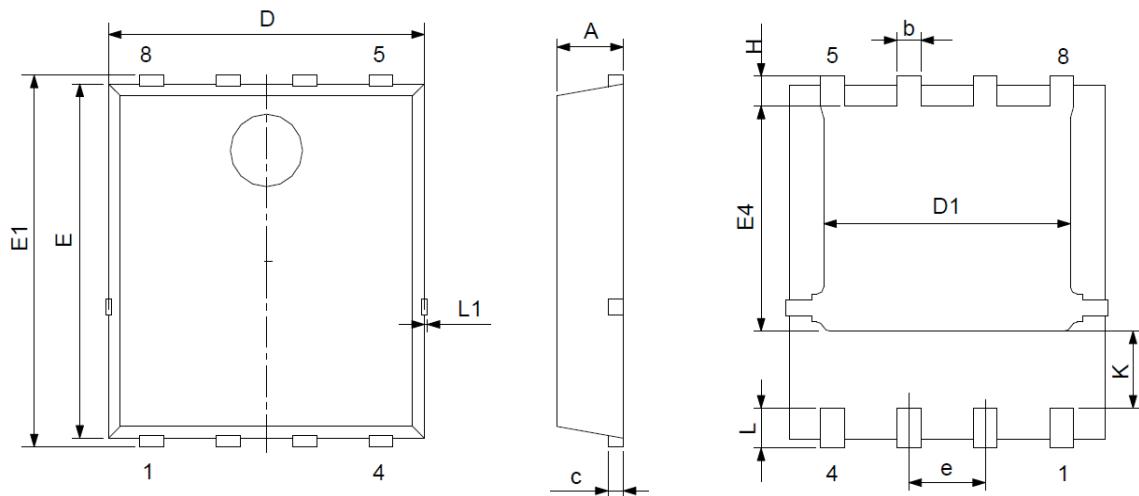


Figure 9. Safe Operation Area

Package Outline Dimensions (PPAK5x6)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.200	0.035	0.047
c	0.154	0.354	0.006	0.014
D	4.800	5.400	0.189	0.213
E	5.660	6.060	0.223	0.239
D1	3.760	4.300	0.148	0.169
E1	5.900	6.350	0.232	0.250
b	0.300	0.550	0.012	0.022
k	1.100	1.500	0.043	0.059
e	1.070	1.370	0.042	0.054
E4	3.340	3.920	0.131	0.154
L	0.300	0.710	0.012	0.028
L1	-	0.120	-	0.005
H	0.400	0.710	0.016	0.028