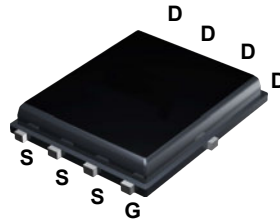
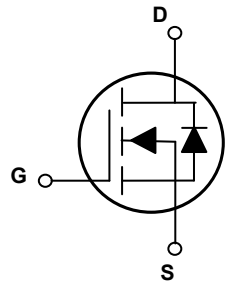


Main Product Characteristics

$V_{(BR)DSS}$	60V
$R_{DS(ON)}$	6.5m Ω (Max.)
I_D	90A



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 GSFP6R506 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 ($T_J=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Parameter	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-to-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current, @ Steady-State ($T_C=25^\circ\text{C}$)	I_D	90	A
Continuous Drain Current, @ Steady-State ($T_C=100^\circ\text{C}$)		63	A
Pulsed Drain Current ²	I_{DM}	360	A
Power Dissipation ($T_C=25^\circ\text{C}$) ³	P_D	60	W
		0.48	W/ $^\circ\text{C}$
Single Pulse Avalanche Energy ¹	E_{AS}	144	mJ
Single Pulse Avalanche Current	I_{AS}	24	A
Junction-to-Ambient (PCB Mounted, Steady-State)	$R_{\theta JA}$	50	$^\circ\text{C}/\text{W}$
Junction-to-Case	$R_{\theta JC}$	2.08	$^\circ\text{C}/\text{W}$
Operating Junction and Storage Temperature Range	T_J/T_{STG}	-55 to +150	$^\circ\text{C}$
Soldering Temperature	T_{sold}	260	$^\circ\text{C}$

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On / Off Characteristics						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0\text{V}, I_D=250\mu\text{A}$	60	-	-	V
Drain-to-Source Leakage Current	I_{DSS}	$V_{DS}=60\text{V}, V_{GS}=0\text{V}, T_J=25^{\circ}\text{C}$	-	-	1.0	μA
		$V_{DS}=60\text{V}, V_{GS}=0\text{V}, T_J=125^{\circ}\text{C}$	-	2.5	-	μA
Gate-to-Source Forward Leakage	I_{GSS}	$V_{DS}=0\text{V}, V_{GS}=20\text{V}$	-	-	100	nA
		$V_{DS}=0\text{V}, V_{GS}=-20\text{V}$	-	-	-100	
Static Drain-to-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10\text{V}, I_D=16\text{A}$	-	5.1	6.5	m Ω
		$V_{GS}=4.5\text{V}, I_D=14\text{A}$	-	8.5	10	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	1.2	-	2.8	V
Dynamic and Switching Characteristics						
Input Capacitance	C_{iss}	$V_{GS}=0\text{V}, V_{DS}=30\text{V}, f=1\text{MHz}$	-	1648	-	pF
Output Capacitance	C_{oss}		-	657	-	
Reverse Transfer Capacitance	C_{rss}		-	45	-	
Total Gate Charge ^{4,5}	Q_g	$I_D=16\text{A}, V_{DD}=30\text{V}, V_{GS}=10\text{V}$	-	31	-	nC
Gate-to-Source Charge ^{4,5}	Q_{gs}		-	7.2	-	
Gate-to-Drain ("Miller") Charge ^{4,5}	Q_{gd}		-	7.0	-	
Gate Plateau ^{4,5}	$V_{plateau}$		-	4.0	-	V
Turn-on Delay Time ^{4,5}	$t_{d(on)}$	$V_{DD}=30\text{V}, V_{GS}=10\text{V}, R_G=3\Omega, I_D=16\text{A}$	-	10	-	nS
Rise Time ^{4,5}	t_r		-	64	-	
Turn-Off Delay Time Time ^{4,5}	$t_{d(off)}$		-	36	-	
Fall Time ^{4,5}	t_f		-	12	-	
Gate Resistance	R_g	$f=1\text{MHz}$	-	2.1	-	Ω
Source-Drain Ratings and Characteristics						
Continuous Source Current (Body Diode)	I_S	$V_G=V_D=0\text{V}$	-	-	90	A
Diode Forward Voltage	V_{SD}	$I_S=16\text{A}, V_{GS}=0\text{V}$	-	-	1.4	V
Reverse Recovery Time ⁴	T_{rr}	$I_S=16\text{A}, V_{GS}=0\text{V}, V_R=48\text{V}, di_f/dt=100\text{A}/\mu\text{s}$	-	35	-	nS
Reverse Recovery Charge ⁴	Q_{rr}		-	30	-	nC

Notes:

1. $L=0.5\text{mH}, V_{DD}=48\text{V}, R_G=25\Omega$, starting temperature $T_J=25^{\circ}\text{C}$.
2. Pulse time of $5\mu\text{s}$.
3. The dissipated power value will change with the temperature. When it is greater than 25°C , the dissipated power value will decrease by $0.55^{\circ}\text{C}/\text{W}$ for every 1 degree of temperature increase.
4. Pulse test : Pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.
5. Basically unaffected by operating temperature.

Typical Electrical and Thermal Characteristic Curves

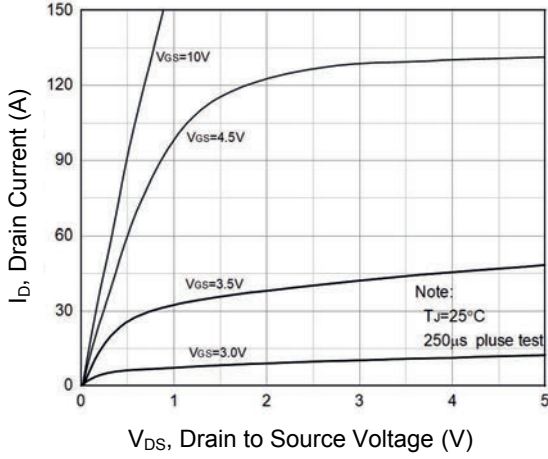


Figure 1. Typical Output Characteristics

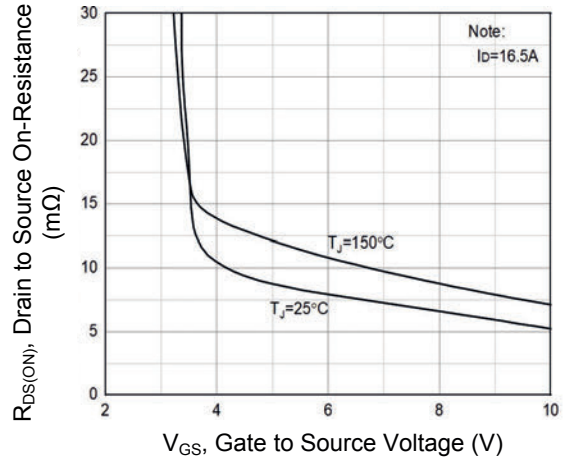


Figure 2. $R_{DS(on)}$ vs. V_{GS}

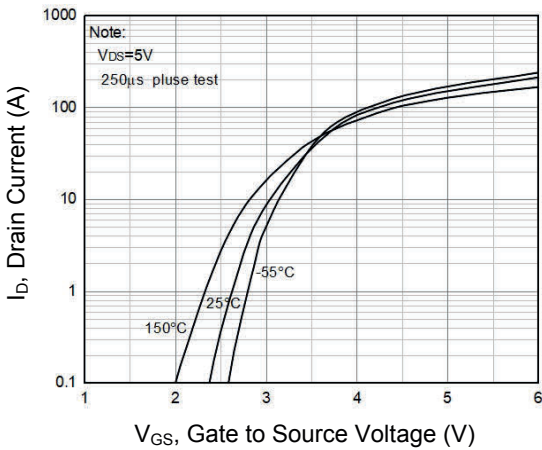


Figure 3. Transfer Characteristics

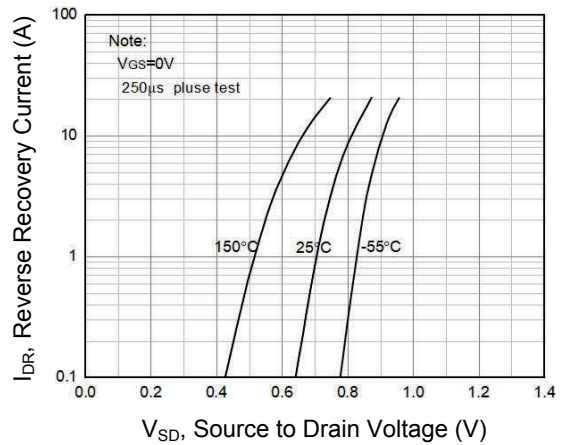


Figure 4. Body Diode Characteristics

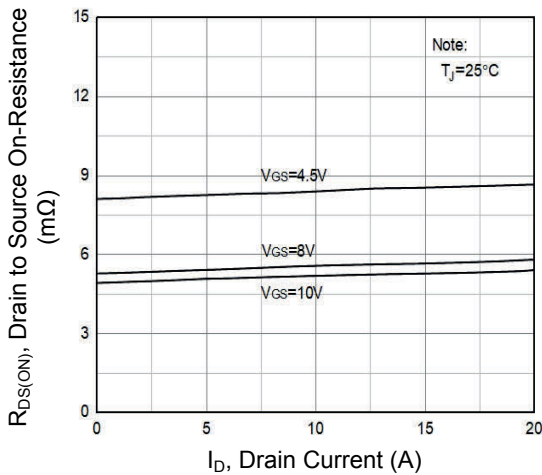


Figure 5. $R_{DS(on)}$ vs. Drain Current

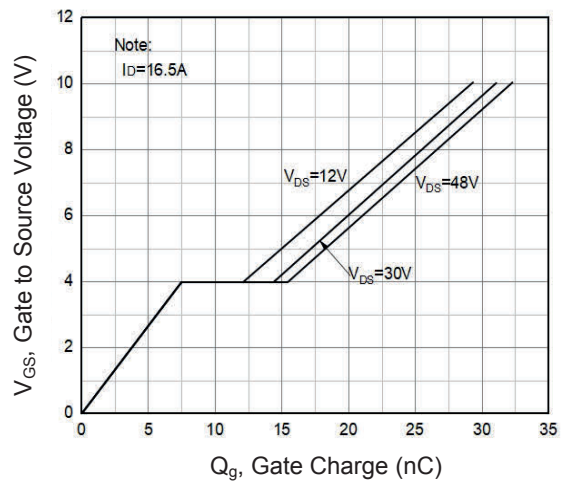


Figure 6. Gate Charge Characteristics

Typical Electrical and Thermal Characteristic Curves

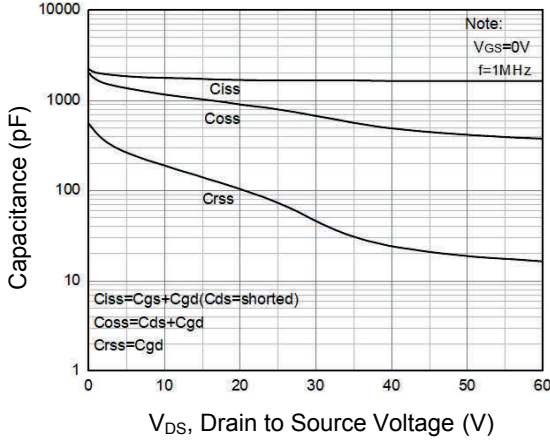


Figure 7. Capacitance Characteristics

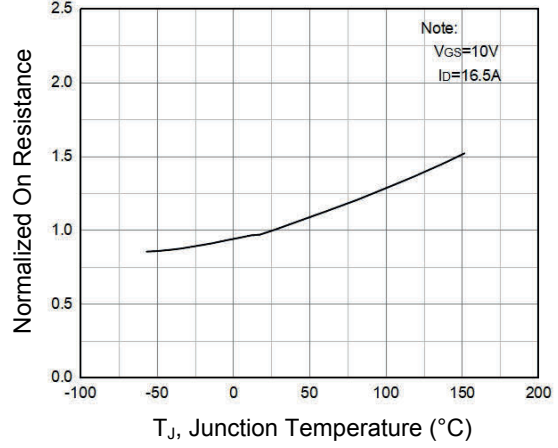


Figure 8. Normalized $R_{DS(ON)}$ vs. T_J

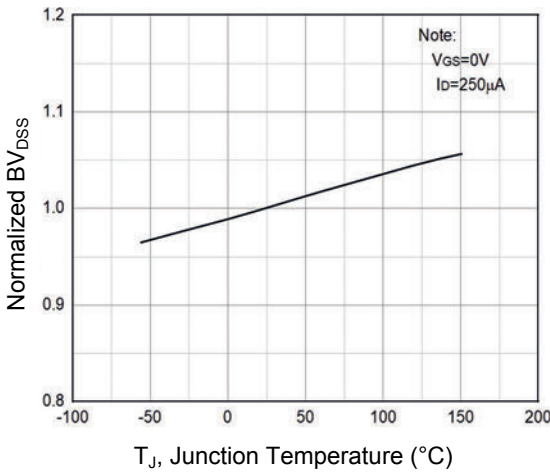


Figure 9. Normalized BV_{DS} vs. T_J

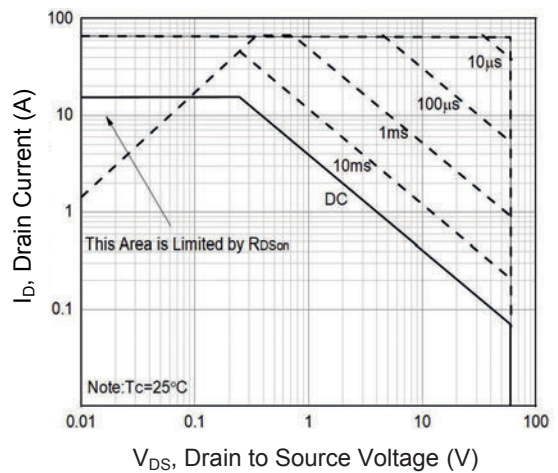
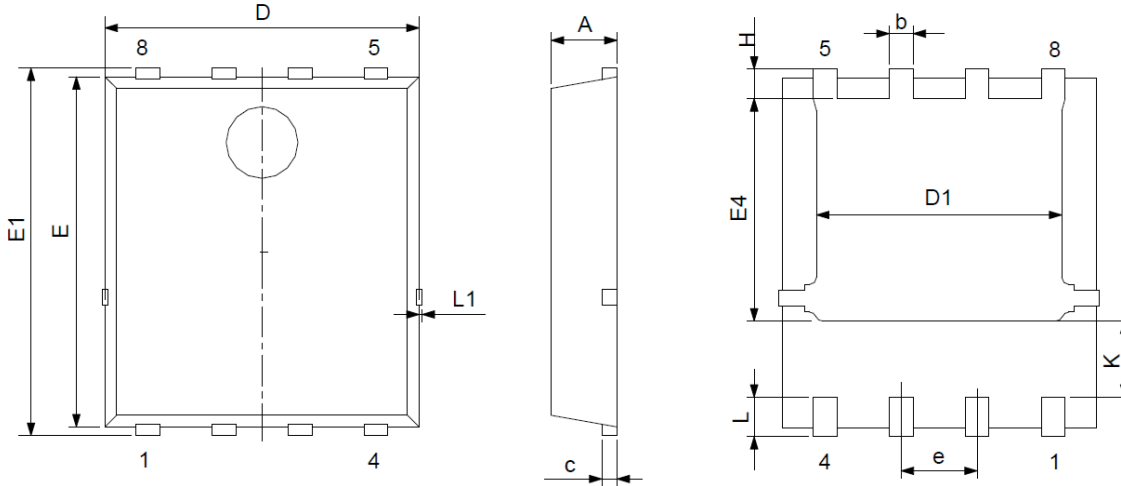


Figure 10. Safe Operation Area

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	0.190	0.213
E	5.660	6.060	0.223	0.240
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

Order Information

Device	Package	Marking	Carrier	Quantity
GSFP6R506	PPAK5x6	P6R506	Tape & Reel	5,000 Pcs / Reel