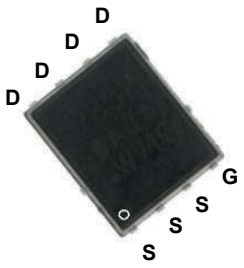
GOOD-ARK SEMICONDUCTOR

GSFP4005SF

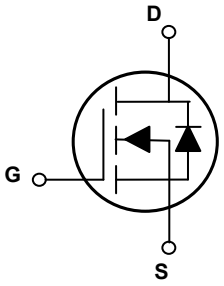
40V N-Channel MOSFET

Main Product Characteristics

BV_{DSS}	40V
$R_{DS(ON)}$	5mΩ (Max)
I_D	96A



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 GSFP4005SF 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_A=25°C unless otherwise specified)

Parameter		Symbol	Max.	Unit
Drain-Source Voltage		V_{DS}	40	V
Gate-Source Voltage		V_{GS}	±20	V
Drain Current	T_C=25°C	I_D	96	A
	T_C=100°C		61	A
	T_A=25°C		27	A
	T_A=70°C		22	A
Pulsed Drain Current[2]		I_{DM}	192	A
Total Power Dissipation[3]	T_C=25°C	P_D	78	W
	T_A=25°C		6.3	W
Thermal Resistance Junction-to-Ambient[1,4]		$R_{\theta JA}$	20	°C/W
Thermal Resistance Junction-to-Case		$R_{\theta JC}$	1.6	°C/W
Junction and Storage Temperature Range		T_J/T_{STG}	-55 to +150	°C

Electrical Characteristics (T_J=25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
On / Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250μA	40	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=40V, V_{GS}=0V, T_C=25°C	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	1.5	-	2.5	V
Static Drain-Source on-Resistance	$R_{DS(on)}$	V_{GS}=10V, I_D=20A	-	4.0	5.0	mΩ
		V_{GS}=4.5V, I_D=16A	-	5.7	7.5	
Dynamic and Switching Characteristics						
Input Capacitance	C_{iss}	V_{DS}=20V, V_{GS}=0V, F=1MHz	-	4100	-	pF
Output Capacitance	C_{oss}		-	280	-	
Reverse Transfer Capacitance	C_{rss}		-	275	-	
Total Gate Charge	Q_g	V_{GS}=10V, V_{DS}=20V, I_D=20A	-	78	-	nC
Gate Source Charge	Q_{gs}		-	11.5	-	
Gate Drain Charge	Q_{gd}		-	18	-	
Turn-on Delay Time	$t_{d(on)}$	V_{GS}=10V, V_{DD}=20V, I_D=20A, R_{GEN}=3Ω	-	27.8	-	nS
Turn-on Rise Time	t_r		-	12.8	-	
Turn-off Delay Time	$t_{d(off)}$		-	96	-	
Turn-off Fall Time	t_f		-	24	-	
Source-Drain Ratings and Characteristics						
Diode Forward Voltage	V_{SD}	I_S=20A, V_{GS}=0V	-	0.8	1.2	V
Maximum Body-Diode Continuous Current	I_S	-	-	-	96	A

Notes:

1. The value of $R_{\theta JA}$ is measured with the device mounted on lin2 FR-4 board with 2oz.Copper,in a still air environment with T_A=25°C. The value in any given application depends on the user's specific board design.
2. Single pulse width limited by junction temperature $T_{J(MAX)}$=150°C.
3. The power dissipation P_D is based on $T_{J(MAX)}$=150°C, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.
4. The $R_{\theta JA}$ is the sum of the thermal impedance from junction to case and case to ambient.

Typical Electrical and Thermal Characteristic Curves

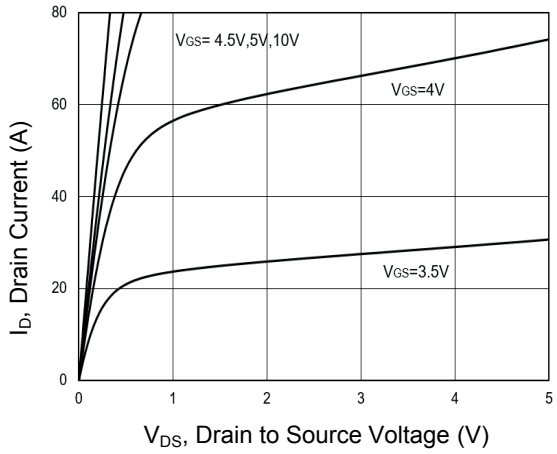


Figure 1. Output Characteristics

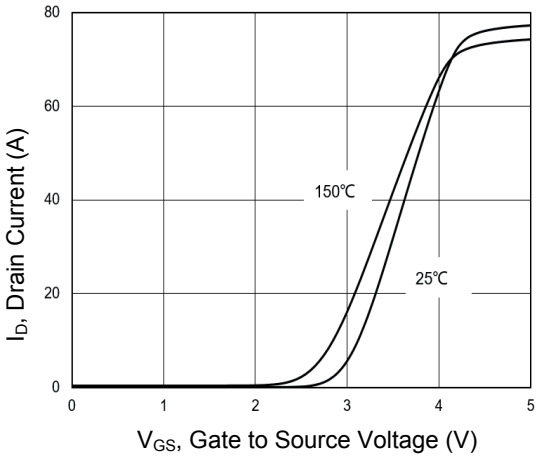


Figure 2. Transfer Characteristics

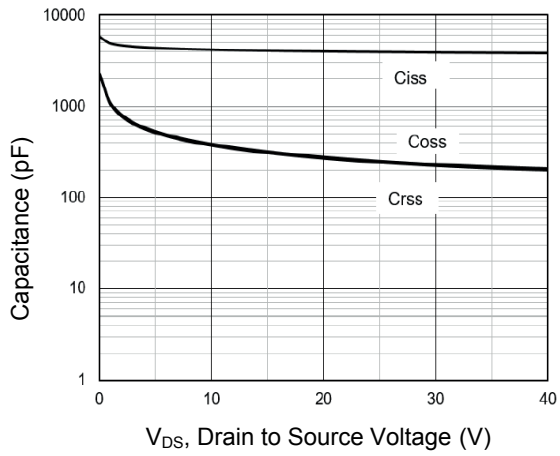


Figure 3. Capacitance Characteristics

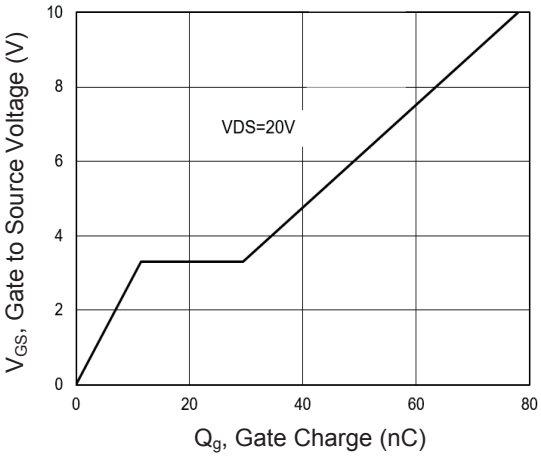


Figure 4. Gate Charge

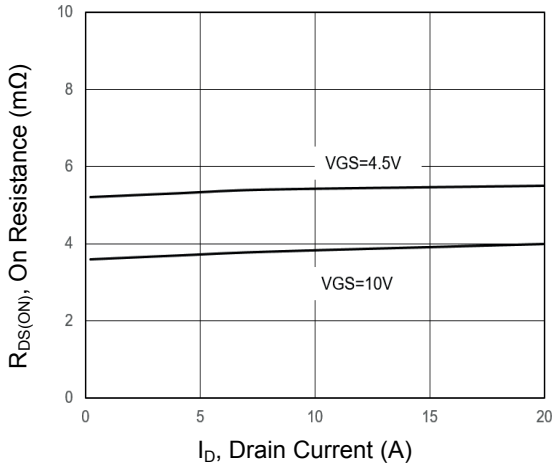


Figure 5. Drain-Source on Resistance

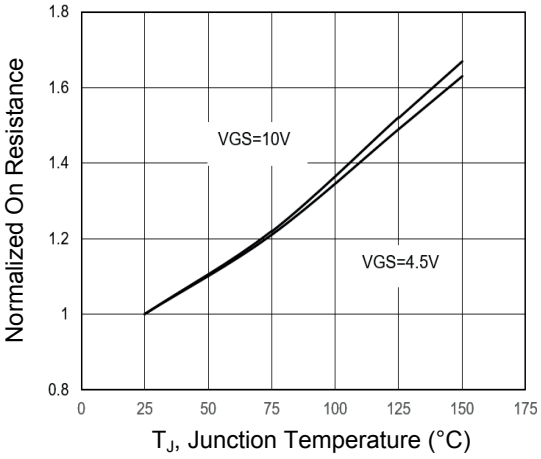


Figure 6. Normalized $R_{DS(ON)}$ vs. T_J

Typical Electrical and Thermal Characteristic Curves

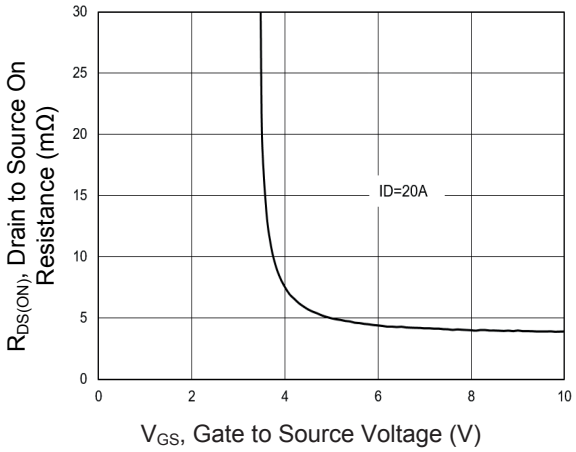


Figure 7. Typical Drain to Source ON Resistance vs. Gate Voltage and Drain Current

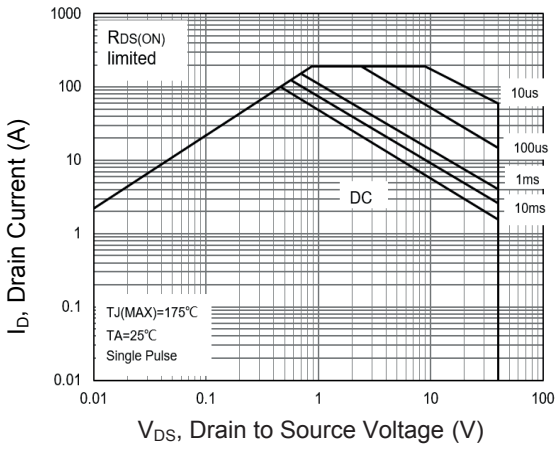


Figure 8. Safe Operation Area

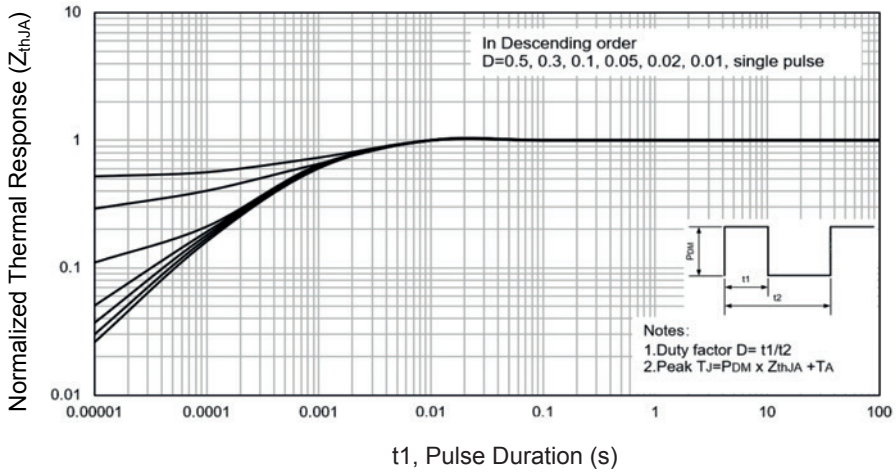
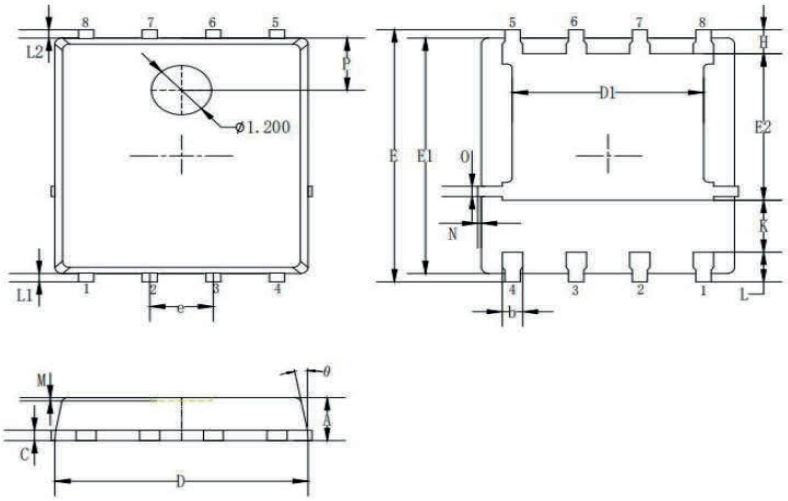


Figure 9. Maximum Effective Transient Thermal Impedance, Junction-to-Case

Package Outline Dimensions (PPAK5x6)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.90	1.20	0.035	0.047
b	0.35	0.50	0.014	0.020
c	0.20	0.35	0.008	0.014
D	4.90	5.20	0.193	0.205
D1	3.72	3.92	0.146	0.154
E	6.00	6.30	0.236	0.248
E1	5.60	5.90	0.220	0.232
E2	3.47	3.67	0.137	0.144
e	1.27 BSC		0.050 BSC	
H	0.48	0.68	0.019	0.027
K	1.17	1.37	0.046	0.054
L	0.64	0.84	0.025	0.033
L1/L2	0.20 REF		0.008 REF	
θ	8°	12°	8°	12°
M	0.08 REF		0.003 REF	
N	0	0.15	0.000	0.006
O	0.25 REF		0.010 REF	
P	1.28 REF		0.050 REF	

Order Information

Device	Package	Marking	Carrier	Quantity
GSFP4005SF	PPAK5x6	N4005SF5	Tape & Reel	5,000pcs / Reel