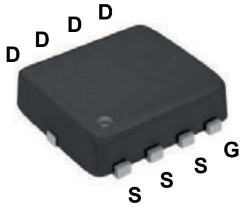
GOOD-ARK
SEMICONDUCTOR

GSFN0450

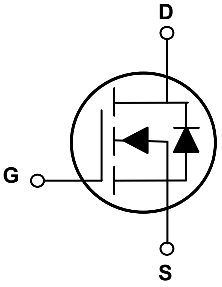
40V N-Channel MOSFET

Main Product Characteristics

$V_{(BR)DSS}$	40V
$R_{DS(ON)}$	8.8mΩ (Max.)
I_D	50A



PPAK3x3



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 GSFN0450 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°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	40	V
Gate-Source Voltage	V_{GS}	±20	V
Pulse Drain Current Tested (T_A=25°C)[1]	I_{DM}	180	A
Continuous Drain Current (T_A=25°C)	I_D	50	A
Continuous Drain Current (T_A=70°C)		40	
Maximum Power Dissipation (T_A=25°C)	P_D	37.8	W
Avalanche Energy, Single Pulsed[2]	E_{AS}	72.6	mJ
Thermal Resistance, Junction to Case	$R_{\theta JC}$	3.3	°C/W
Maximum Junction Temperature	T_J	150	°C
Storage Temperature Range	T_{STG}	-50 to +150	°C

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

Parameter	Symbol	Condition	Min	Typ	Max	Unit
On / Off Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=250µA	40	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=40V, V_{GS}=0V, T_A=25°C	-	-	1	µA
		V_{DS}=32V, V_{GS}=0V, T_A=125°C	-	-	100	
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±10	uA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250µA	1.0	1.5	2.5	V
Drain-Source On-State Resistance[3]	$R_{DS(ON)}$	V_{GS}=10V, I_D=15A	-	7.2	8.8	mΩ
		V_{GS}=4.5V, I_D=8A	-	8.8	11	
Dynamic and Switching Characteristics						
Input Capacitance	C_{iss}	V_{DS}=20V, V_{GS}=0V, f=1MHz	-	1731	-	pF
Output Capacitance	C_{oss}		-	171	-	
Reverse Transfer Capacitance	C_{rss}		-	137	-	
Total Gate Charge	Q_g	V_{DS}=20V, I_D=10A, V_{GS}=10V	-	33	-	nC
Gate Source Charge	Q_{gs}		-	2.8	-	
Gate Drain Charge	Q_{gd}		-	6.5	-	
Turn On Delay Time	$t_{d(on)}$	V_{DD}=20V, R_G=3.3Ω, I_D=1A, V_{GS}=10V	-	8.1	-	nS
Turn On Rise Time	t_r		-	15	-	
Turn Off Delay Time	$t_{d(off)}$		-	32	-	
Turn Off Fall Time	t_f		-	12	-	
Gate Resistance	R_g	f=1MHz	-	3.7	-	Ω
Drain-Source Ratings and Characteristics						
Forward On Voltage[3]	V_{SD}	I_{SD}=15A, V_{GS}=0V	-	-	1.2	V
Diode Continuous Forward Current	I_S	T_A=25°C	-	-	50	A

Note:
1. Pulse width limited by maximum allowable junction temperature.
2. Limited by T_{Jmax}, starting T_J=25°C, L=0.3mH, R_g=25Ω, I_{AS}=22A, V_{GS}=10V. Part not recommended for use above this value.
3. Pulse width ≤300uS, duty cycle ≤2%.

Typical Electrical and Thermal Characteristic Curves

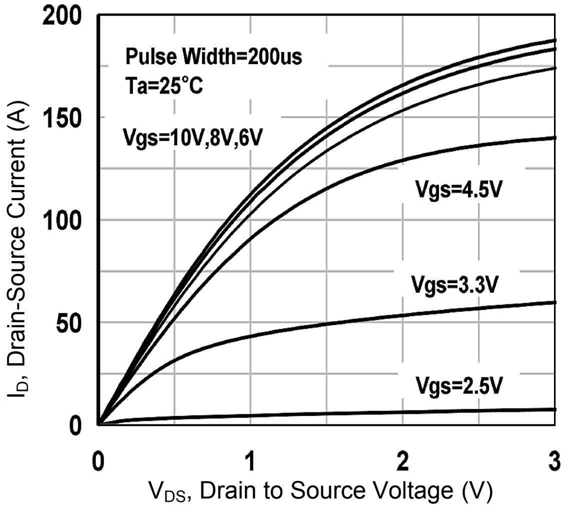


Figure 1. Typical Output Characteristics

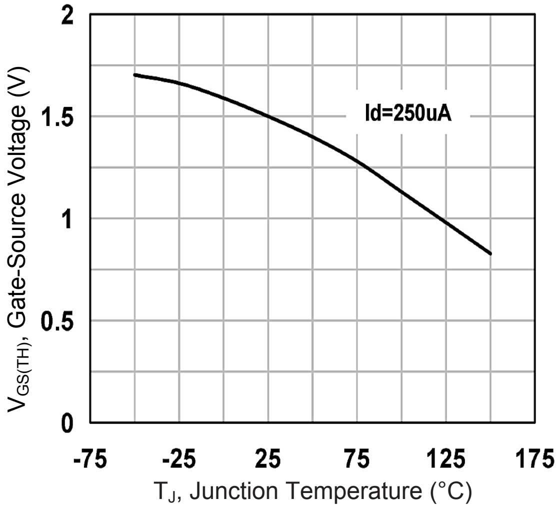


Figure 2. $V_{GS(TH)}$ vs. Temperature

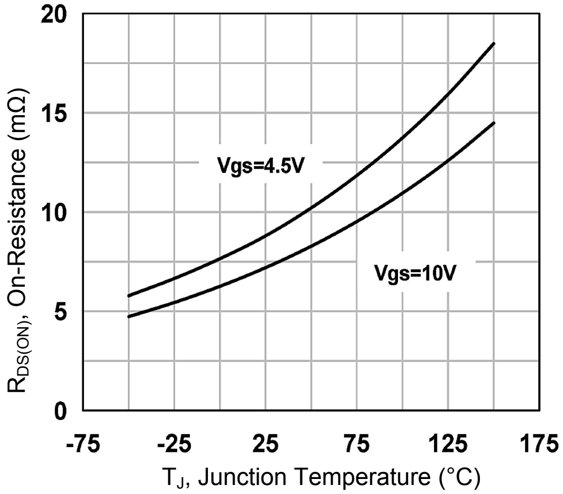


Figure 3. On-Resistance vs. Temperature

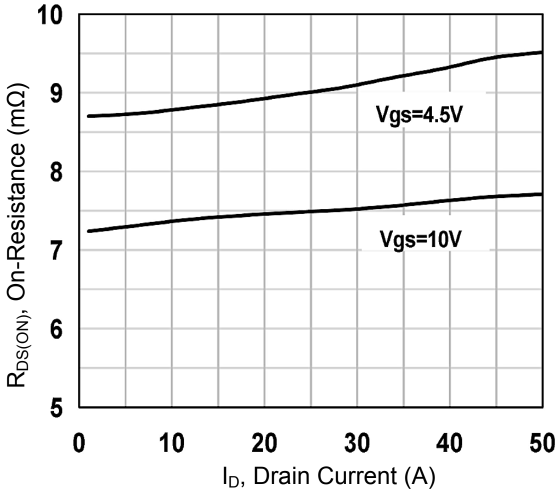


Figure 4. On-Resistance vs. Drain Current

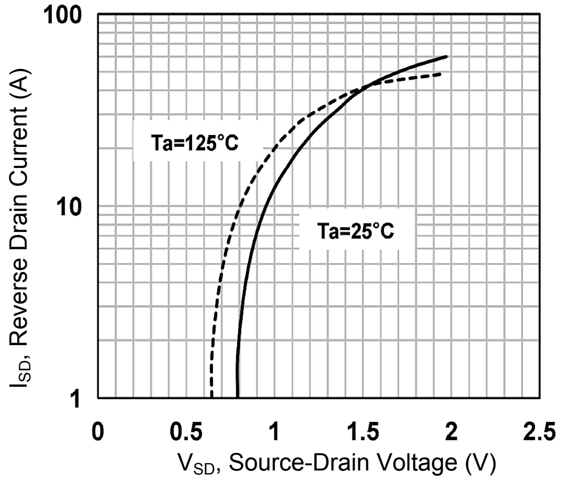


Figure 5. Typical Source-Drain Diode Forward Voltage

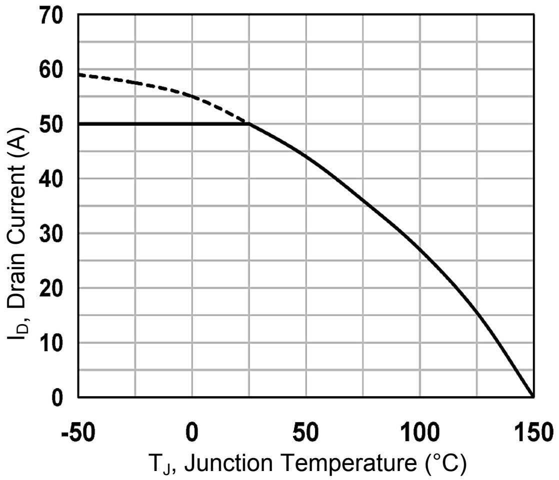


Figure 6. Drain Current vs. T_J

Typical Electrical and Thermal Characteristic Curves

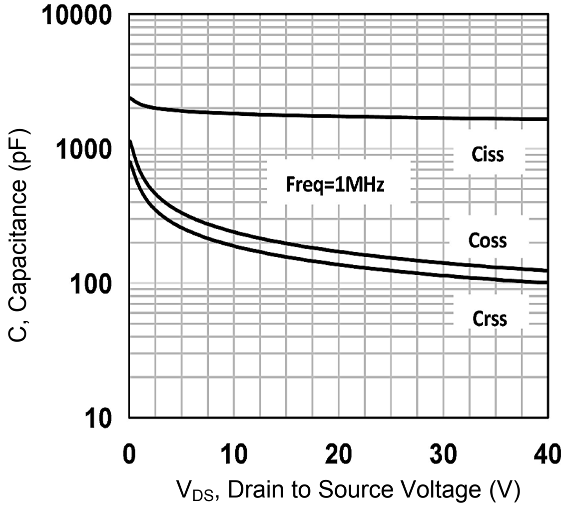


Figure 7. Typical Capacitance vs. Drain-Source Voltage

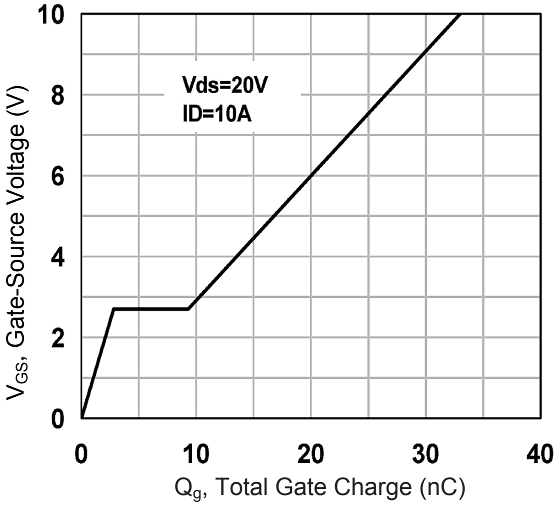


Figure 8. Typical Gate Charge vs. Gate-Source Voltage

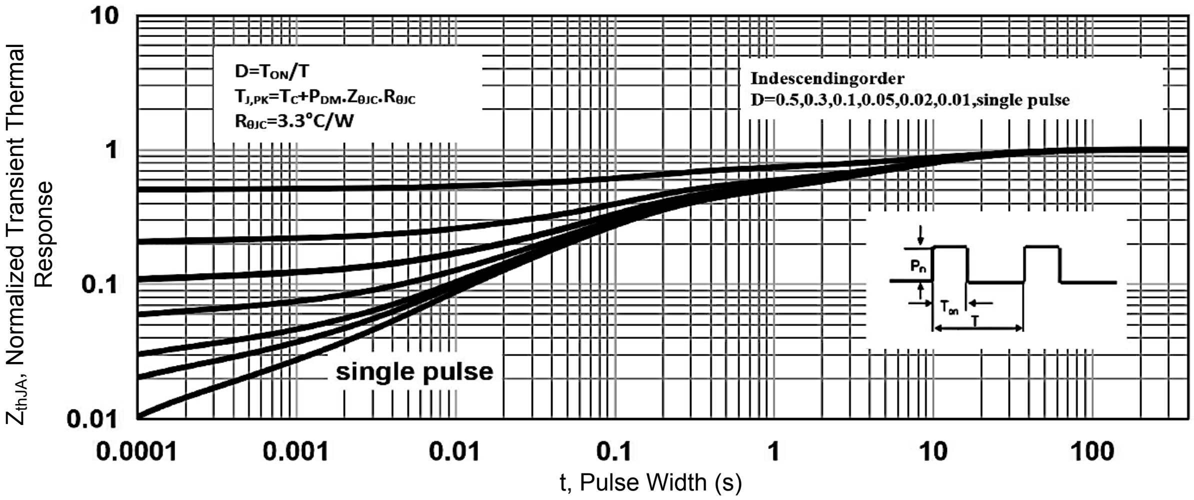
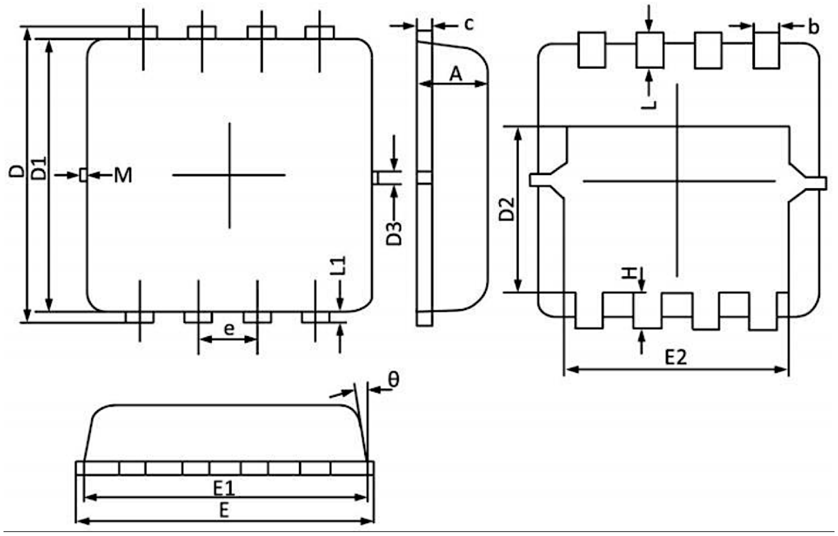


Figure 9. Normalized Maximum Transient Thermal Impedance

Package Outline Dimensions (PPAK3x3)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.700	0.800	0.028	0.031
b	0.250	0.350	0.010	0.014
C	0.100	0.250	0.004	0.010
D	3.250	3.450	0.128	0.136
D1	3.000	3.200	0.118	0.126
D2	1.780	1.980	0.070	0.078
D3	0.130 TYP		0.005 TYP	
E	3.200	3.400	0.126	0.134
E1	3.000	3.200	0.118	0.126
E2	2.390	2.590	0.094	0.102
e	0.650 BSC		0.026 BSC	
H	0.300	0.500	0.012	0.020
L	0.300	0.500	0.012	0.020
L1	0.130 TYP		0.005 TYP	
θ	-	12°	-	12°
M	-	0.150	-	0.006

Order Information

Device	Package	Marking	Packaging	SPQ
GSFN0450	PPAK3x3	009N04	Tape & Reel	5,000 Pcs / Reel

For more information, please contact us at: inquiry@goodarksemi.com