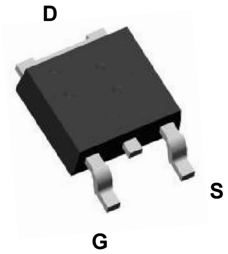
GSFD0460

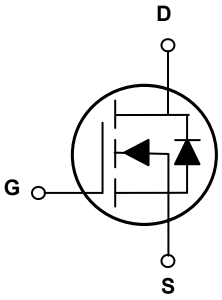
40V N-Channel MOSFET

Main Product Characteristics

BV_{DSS}	40V
$R_{DS(ON)}$	6.7mΩ
I_D	60A



TO-252 (DPAK)



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 GSFD0460 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 supply and a wide variety of other applications.

Absolute Maximum Ratings (T_C=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-Continuous (T_C=25°C)	I_D	60	A
Drain Current-Continuous (T_C=100°C)		38	
Drain Current-Pulsed[1]	I_{DM}	240	A
Single Pulse Avalanche Energy[2]	E_{AS}	76	mJ
Single Pulse Avalanche Current[2]	I_{AS}	39	A
Power Dissipation (T_C=25°C)	P_D	62	W
Power Dissipation-Derate above 25°C		0.496	W/°C
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	2.01	°C/W
Operating Junction Temperature Range	T_J	-55 To +150	°C
Storage Temperature Range	T_{STG}	-55 To +150	°C

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On/Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250μA	40	-	-	V
BV_{DSS} Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to 25°C, I_D=1mA	-	0.03	-	V/°C
Drain-Source Leakage Current	I_{DSS}	V_{DS}=40V, V_{GS}=0V, T_J=25°C	-	-	1	μA
		V_{DS}=32V, V_{GS}=0V, T_J=125°C	-	-	10	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Static Drain-Source On-Resistance[3]	$R_{DS(ON)}$	V_{GS}=10V, I_D=10A	-	5.7	6.7	mΩ
		V_{GS}=4.5V, I_D=5A	-	7	8.8	
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_D=250μA	1.2	1.6	2.5	V
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}$		-	-5	-	mV/°C
Forward Transconductance	gfs	V_{DS}=10V, I_D=3A	-	16	-	S
Dynamic and Switching Characteristics						
Total Gate Charge[3,4]	Q_g	V_{DS}=20V, I_D=10A, V_{GS}=4.5V	-	16.2	32	nC
Gate-Source Charge[3,4]	Q_{gs}		-	3.85	7	
Gate-Drain Charge[3,4]	Q_{gd}		-	6.05	12	
Turn-On Delay Time[3,4]	$t_{d(on)}$	V_{DD}=15V, R_G=6Ω, V_{GS}=10V, I_D=1A	-	13.6	25	nS
Rise Time[3,4]	t_r		-	2.5	5	
Turn-Off Delay Time[3,4]	$t_{d(off)}$		-	68	120	
Fall Time[3,4]	t_f		-	5	10	
Input Capacitance	C_{iss}	V_{DS}=25V, V_{GS}=0V, F=1MHz	-	1540	2500	pF
Output Capacitance	C_{oss}		-	171	330	
Reverse Transfer Capacitance	C_{rss}		-	115	220	
Gate Resistance	R_g	V_{GS}=0V, V_{DS}=0V, F=1MHz	-	1.2	2.2	Ω
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I_S	V_G=V_D=0V, Force Current	-	-	60	A
Pulsed Source Current[3]	I_{SM}		-	-	120	A
Diode Forward Voltage[3]	V_{SD}	V_{GS}=0V, I_S=1A, T_J=25°C	-	-	1	V

Note:

1. Repetitive rating: Pulsed width limited by maximum junction temperature.
2. V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=39A, starting T_J=25°C.
3. Pulse test: pulse width ≤300us,duty cycle ≤2%.
4. Essentially independent of operation temperature.

Typical Electrical and Thermal Characteristic Curves

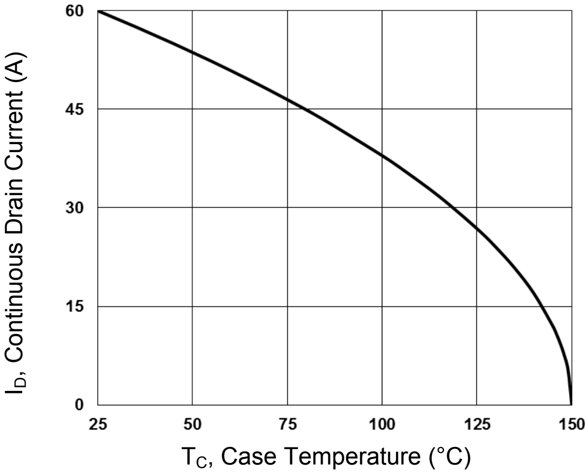


Figure 1. Continuous Drain Current vs. T_C

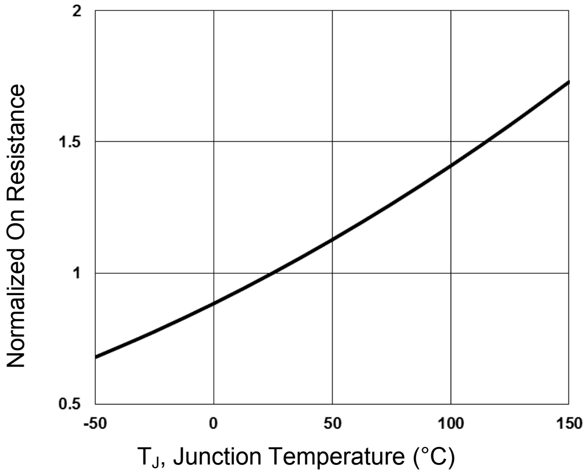


Figure 2. Normalized R_{DSON} vs. T_J

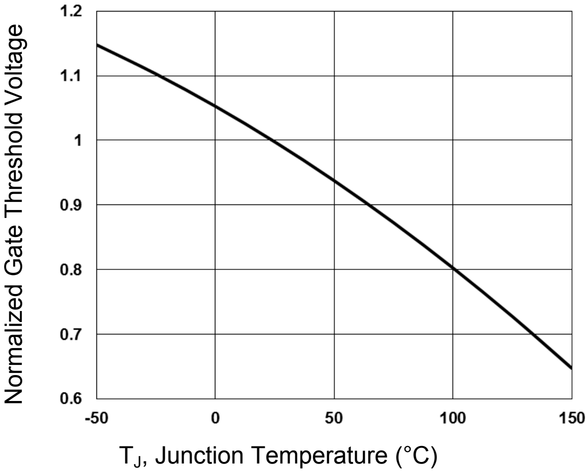


Figure 3. Normalized V_{th} vs. T_J

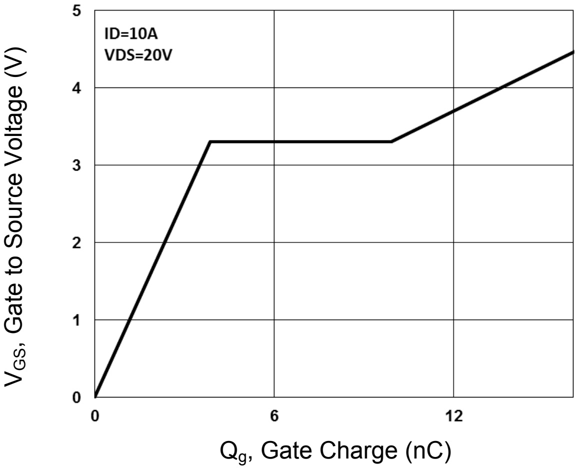


Figure 4. Gate Charge Waveform

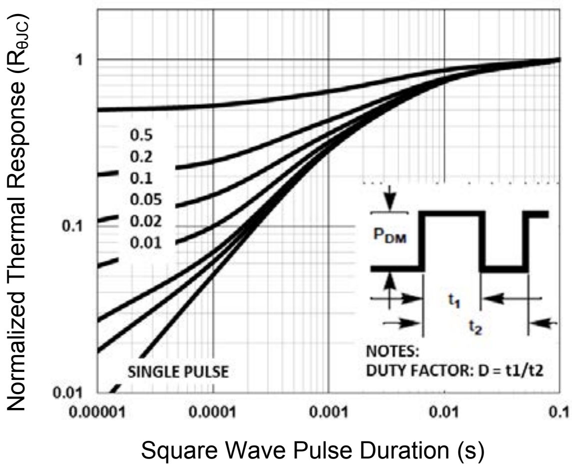


Figure 5. Normalized Transient Impednace

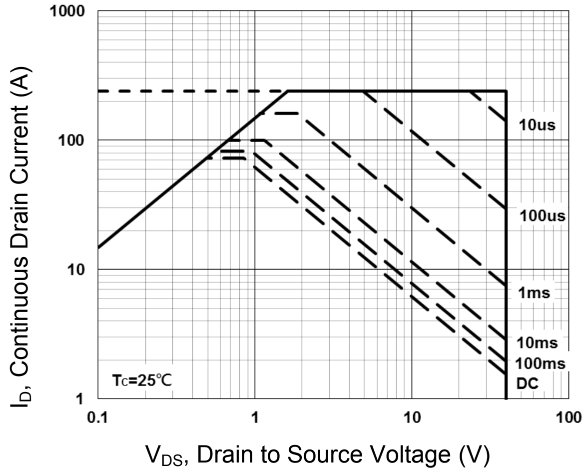
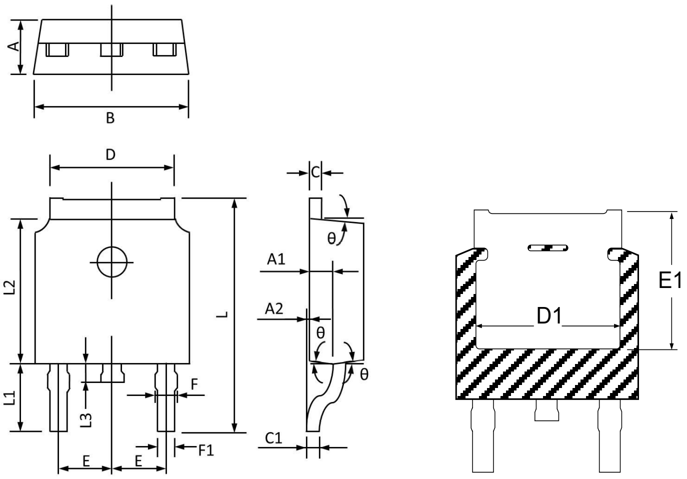


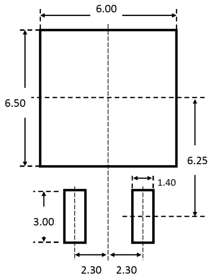
Figure 6. Maximum Safe Operation Area

Package Outline Dimensions TO-252 (DPAK)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.150	2.450	0.085	0.096
A1	0.900	1.200	0.035	0.047
A2	0.000	0.250	0.000	0.010
B	6.300	6.800	0.248	0.268
C	0.350	0.600	0.014	0.024
C1	0.380	0.600	0.015	0.024
D	5.100	5.500	0.201	0.217
D1	4.950	5.400	0.195	0.212
E	2.000	2.400	0.079	0.094
E1	4.950	5.650	0.194	0.222
F	0.600	1.150	0.024	0.045
F1	0.500	0.900	0.020	0.035
L	9.400	10.400	0.370	0.409
L1	2.400	3.100	0.094	0.122
L2	5.300	6.300	0.209	0.248
L3	0.600	1.200	0.024	0.047
θ	3°	9°	3°	9°

Recommended Pad Layout



unit : mm

Order Information

Device	Package	Marking	Carrier	Quantity
GSFD0460	TO-252 (DPAK)	DD4964	Tape & Reel	2,500pcs / Reel

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