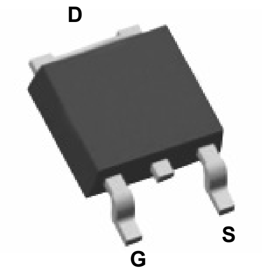
GOOD-ARK SEMICONDUCTOR

GSFD0625

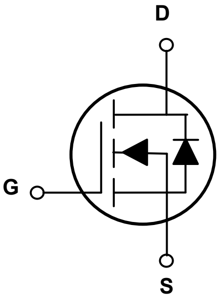
60V N-Channel MOSFET

Main Product Characteristics

$V_{(BR)DSS}$	60V
$R_{DS(ON)}$	28mΩ
I_D	27A



TO-252 (DPAK)



Schematic Diagram

Features and Benefits

- Advanced MOSFET process technology
- Ideal for motor drive, power tools and LED lighting
- Low on-resistance with low gate charge
- Fast switching and reverse body recovery

RoHS Compliant

Description

The GSFD0625 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}	60	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous (T_C=25°C)	I_D	27	A
Drain Current-Continuous (T_C=100°C)		17	
Drain Current-Pulsed[1]	I_{DM}	108	A
Single Pulse Avalanche Energy[2]	E_{AS}	26.5	mJ
Single Pulse Avalanche Current[2]	I_{AS}	23	A
Power Dissipation (T_C=25°C)	P_D	40	W
Power Dissipation-Derate above 25°C		0.32	W/°C
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	3.1	°C/W
Operating Junction Temperature Range	T_J	-50 To +150	°C
Storage Temperature Range	T_{STG}	-50 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=250uA	60	-	-	V
BV_{DSS} Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to 25°C, I_D=1mA	-	0.06	-	V/°C
Drain-Source Leakage Current	I_{DSS}	V_{DS}=60V, V_{GS}=0V, T_J=25°C	-	-	1	μA
		V_{DS}=48V, 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	$R_{DS(ON)}$	V_{GS}=10V, I_D=15A	-	23	28	mΩ
		V_{GS}=4.5V, I_D=10A	-	27	34	
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_D=250μA	1.2	1.7	2.5	V
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}$		-	-4.6	-	mV/°C
Forward Transconductance	g_{fs}	V_{DS}=10V, I_D=8A	-	11	-	S
Dynamic and Switching Characteristics						
Total Gate Charge[3,4]	Q_g	V_{DS}=30V, I_D=10A V_{GS}=10V	-	16.4	32	nC
Gate-Source Charge[3,4]	Q_{gs}		-	3.1	6	
Gate-Drain Charge[3,4]	Q_{gd}		-	3.7	7	
Turn-On Delay Time[3,4]	$t_{d(on)}$	V_{DD}=30V, R_G=6Ω V_{GS}=10V, I_D=1A	-	4.6	9	nS
Rise Time[3,4]	t_r		-	14.8	28	
Turn-Off Delay Time[3,4]	$t_{d(off)}$		-	27.2	52	
Fall Time[3,4]	t_f		-	7.8	15	
Input Capacitance	C_{iss}	V_{DS}=30V, V_{GS}=0V , F=1MHz	-	1180	2200	pF
Output Capacitance	C_{oss}		-	80	160	
Reverse Transfer Capacitance	C_{rss}		-	52	100	
Gate Resistance	R_g	V_{GS}=0V, V_{DS}=0V, F=1MHz	-	1.3	2.6	Ω
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I_S	V_G=V_D=0V, Force Current	-	-	27	A
Pulsed Source Current	I_{SM}		-	-	54	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=1A, T_J=25°C	-	-	1	V
Reverse Recovery Time[2]	t_{rr}	V_{GS}=0V, I_S=10A, di/dt=100A/μs, T_J=25°C	-	23	-	nS
Reverse Recovery Charge[2]	Q_{rr}		-	13	-	nC

Note:

1. Repetitive rating: Pulsed width limited by maximum junction temperature.
2. V_{DD}=50V, V_{GS}=10V, L=0.1mH, I_{AS}=23A, R_G=25Ω, starting T_J=25°C.
3. Pulse test: pulse width $\leqslant$300us,duty cycle$\leqslant$2%.
4. Essentially independent of operation temperature.

Typical Electrical and Thermal Characteristic Curves

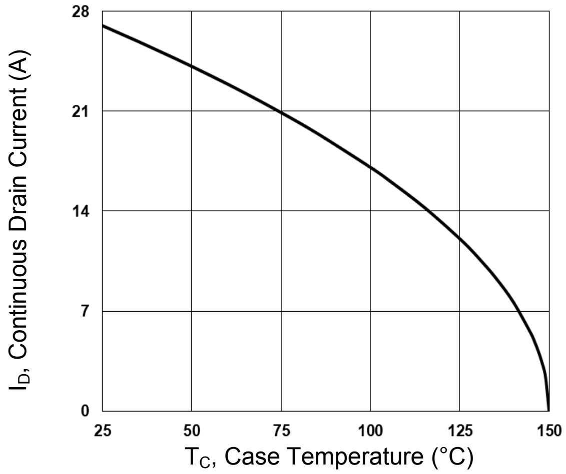


Figure 1. Continuous Drain Current vs. T_C

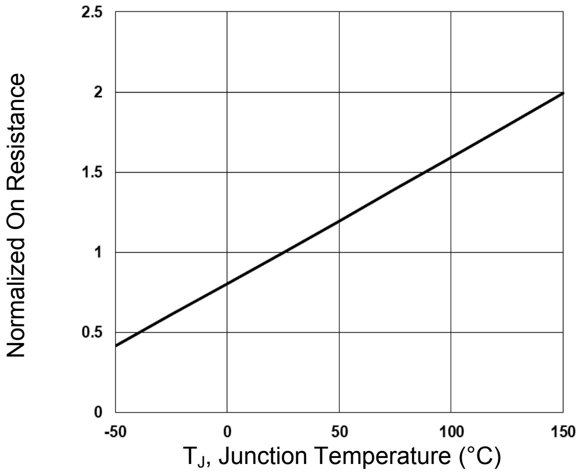


Figure 2. Normalized R_{DSON} vs. T_J

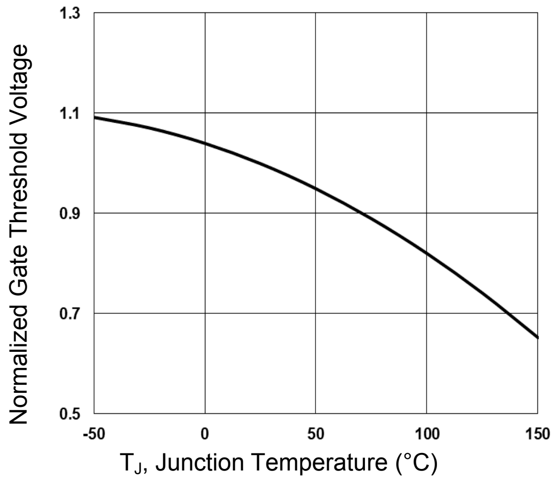


Figure 3. Normalized V_{th} vs. T_J

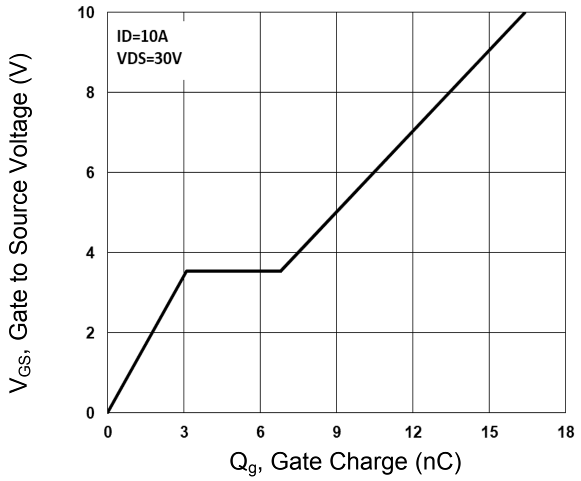


Figure 4. Gate Charge Waveform

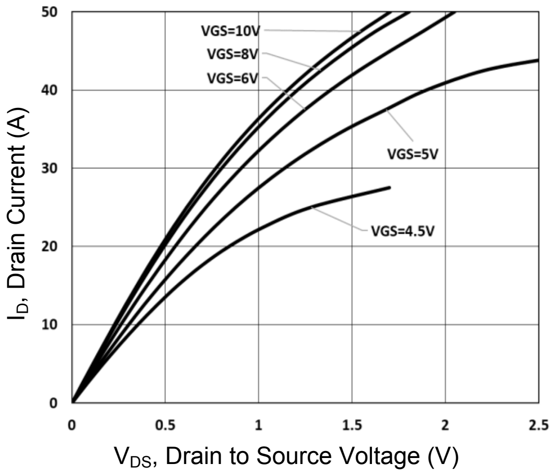


Figure 5. Typical Output Characteristics

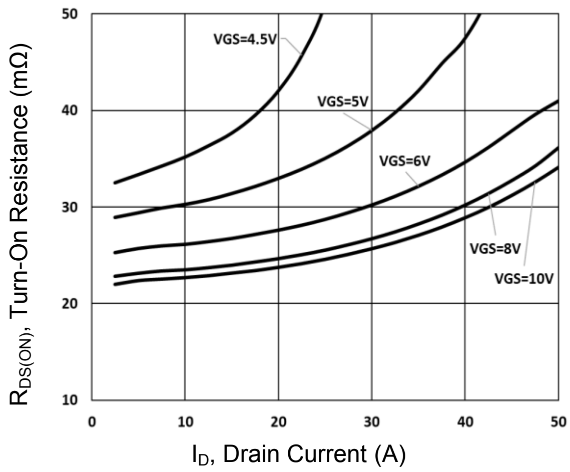


Figure 6. Turn-on Resistance vs. I_D

Typical Electrical and Thermal Characteristic Curves

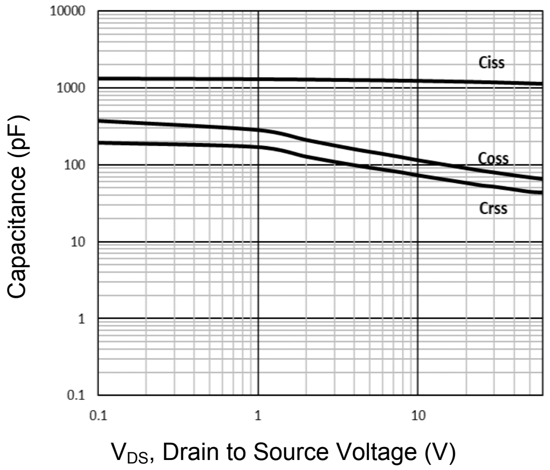


Figure 7. Capacitance Characteristics

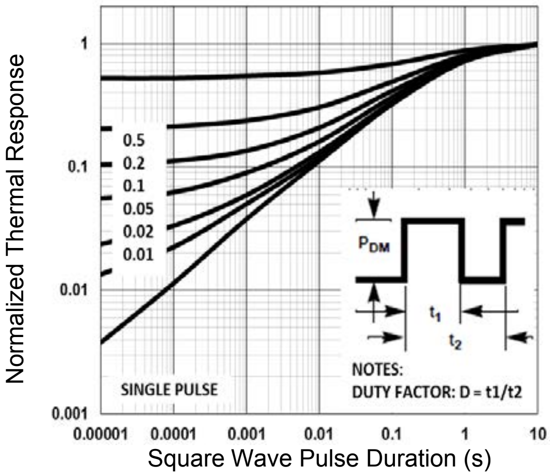


Figure 8. Normalized Transient Impedance

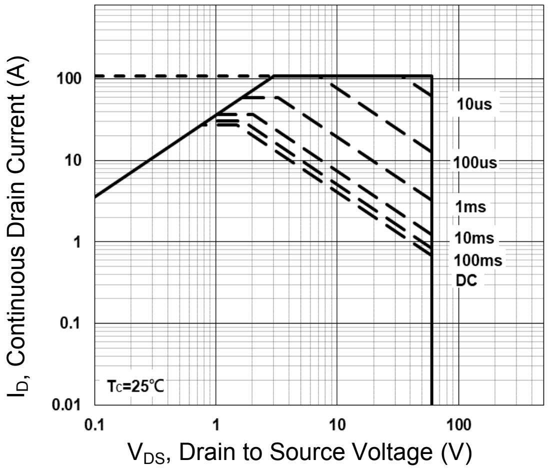


Figure 9. Maximum Safe Operation Area

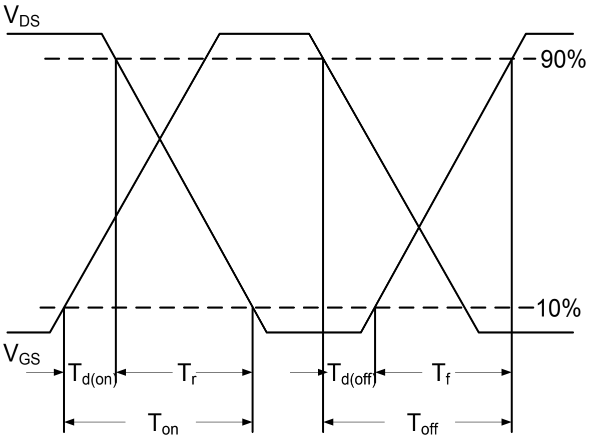


Figure 10. Switching Time Waveform

$$E_{AS}=\frac{1}{2}L\times I_{AS}^{2}\times\frac{BV_{DSS}}{BV_{DSS}-V_{DD}}$$

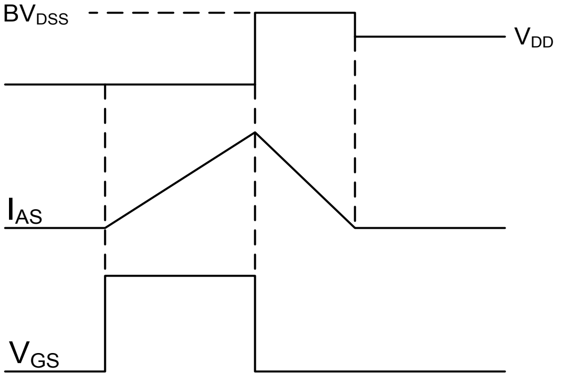
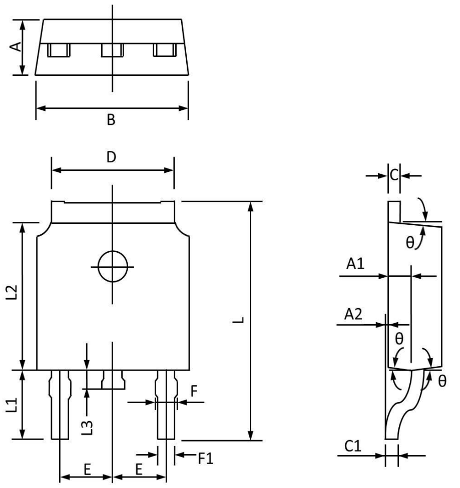


Figure 11. E_{AS} Waveform

Package Outline Dimensions TO-252 (DPAK)



<table>
<tr><th rowspan="2">Symbol</th><th colspan="2">Dimensions In Millimeters</th><th colspan="2">Dimensions In Inches</th></tr>
<tr><th>Min.</th><th>Max.</th><th>Min.</th><th>Max.</th></tr>
<tr><td>A</td><td>2.150</td><td>2.450</td><td>0.085</td><td>0.096</td></tr>
<tr><td>A1</td><td>0.910</td><td>1.200</td><td>0.036</td><td>0.047</td></tr>
<tr><td>A2</td><td>0.000</td><td>0.150</td><td>0.000</td><td>0.006</td></tr>
<tr><td>B</td><td>6.300</td><td>6.800</td><td>0.248</td><td>0.268</td></tr>
<tr><td>C</td><td>0.350</td><td>0.580</td><td>0.014</td><td>0.023</td></tr>
<tr><td>C1</td><td>0.380</td><td>0.550</td><td>0.015</td><td>0.022</td></tr>
<tr><td>D</td><td>5.100</td><td>5.500</td><td>0.201</td><td>0.217</td></tr>
<tr><td>E</td><td>2.000</td><td>2.390</td><td>0.079</td><td>0.094</td></tr>
<tr><td>F</td><td>0.600</td><td>0.940</td><td>0.024</td><td>0.037</td></tr>
<tr><td>F1</td><td>0.500</td><td>0.860</td><td>0.020</td><td>0.034</td></tr>
<tr><td>L</td><td>9.400</td><td>10.400</td><td>0.370</td><td>0.409</td></tr>
<tr><td>L1</td><td>2.400</td><td>3.000</td><td>0.094</td><td>0.118</td></tr>
<tr><td>L2</td><td>5.300</td><td>6.200</td><td>0.209</td><td>0.244</td></tr>
<tr><td>L3</td><td>0.600</td><td>1.200</td><td>0.024</td><td>0.047</td></tr>
<tr><td>θ</td><td>3°</td><td>9°</td><td>3°</td><td>9°</td></tr>
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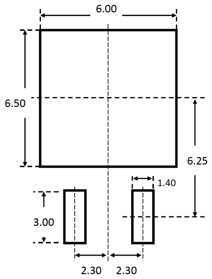
Recommended Pad Layout



unit: mm

Order Information

Device	Package	Marking	Carrier	Quantity
GSFD0625	TO-252 (DPAK)	DD6908	Tape & Reel	2,500pcs / Reel

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