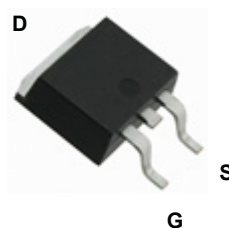
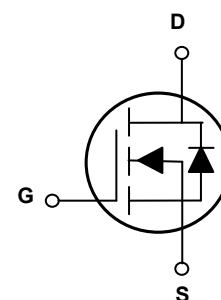


Main Product Characteristics

BV_{DSS}	25V
$R_{DS(ON)}$	6.5m Ω
I_D	55A



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 GSFD0256 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 ($T_C=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V_{DS}	25	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous ($T_C=25^\circ\text{C}$)	I_D	55	A
Drain Current-Continuous ($T_C=100^\circ\text{C}$)		35	A
Drain Current-Pulsed ¹	I_{DM}	220	A
Single Pulse Avalanche Energy ²	E_{AS}	48	mJ
Single Pulse Avalanche Current ²	I_{AS}	31	A
Power Dissipation ($T_C=25^\circ\text{C}$)	P_D	35	W
Power Dissipation-De-rate Above 25 $^\circ\text{C}$		0.28	W/ $^\circ\text{C}$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	3.57	$^\circ\text{C}/\text{W}$
Storage Temperature Range	T_{STG}	-55 To +150	$^\circ\text{C}$
Operating Junction Temperature Range	T_J	-55 To +150	$^\circ\text{C}$

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	25	-	-	V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =25V, V _{GS} =0V, T _J =25°C	-	-	1	μA
		V _{DS} =20V, V _{GS} =0V, T _J =125°C	-	-	10	μA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
On Characteristics						
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =10A	-	5.5	6.5	mΩ
		V _{GS} =4.5V, I _D =6A	-	8.3	10.5	mΩ
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1.2	1.6	2.5	V
Forward Transconductance	g _{fs}	V _{DS} =10V, I _D =3A	-	11	-	S
Dynamic and Switching Characteristics						
Total Gate Charge ^{3,4}	Q _g	V _{DS} =15V, I _D =30A, V _{GS} =10V	-	15.4	23	nC
Gate-Source Charge ^{3,4}	Q _{gs}		-	1.8	3	
Gate-Drain Charge ^{3,4}	Q _{gd}		-	4.8	8	
Turn-On Delay Time ^{3,4}	t _{d(on)}	V _{DD} =15V, R _G =6Ω, V _{GS} =10V, I _D =30A	-	5	7.5	nS
Rise Time ^{3,4}	t _r		-	13	20	
Turn-Off Delay Time ^{3,4}	t _{d(off)}		-	28	42	
Fall Time ^{3,4}	t _f		-	8	12	
Input Capacitance	C _{iss}	V _{DS} =15V, V _{GS} =0V, F=1MHz	-	890	1335	pF
Output Capacitance	C _{oss}		-	165	248	
Reverse Transfer Capacitance	C _{rss}		-	135	203	
Gate Resistance	R _g	V _{GS} =0V, V _{DS} =0V, F=1MHz	-	1.2	-	Ω
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I _S	V _G =V _D =0V, Force Current	-	-	55	A
Pulsed Source Current	I _{SM}		-	-	110	A
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =1A, T _J =25°C	-	-	1	V
Reverse Recovery Time	T _{rr}	V _{GS} =0V, I _S =10A, di/dt=100A/μs, T _J =25°C	-	590	-	nS
Reverse Recovery Charge	Q _{rr}		-	1.85	-	uC

Note:

1. Repetitive rating: Pulsed width limited by maximum junction temperature.
2. V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=31A., R_G=25Ω, 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

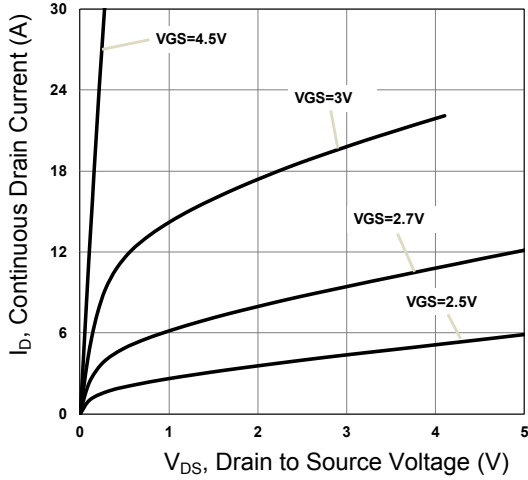


Fig.1 Typical Output Characteristics

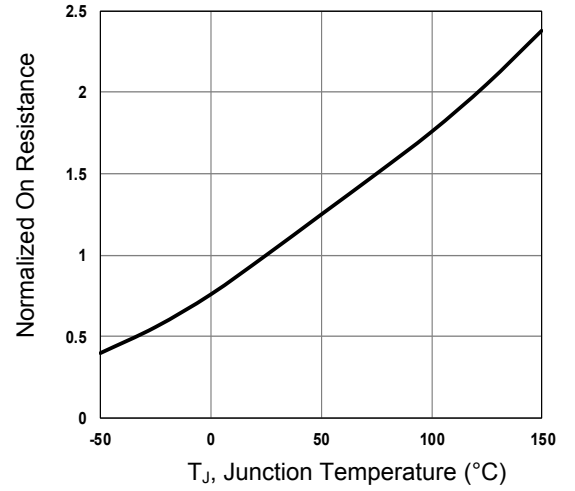


Fig.2 Normalized $R_{DS(ON)}$ vs. T_J

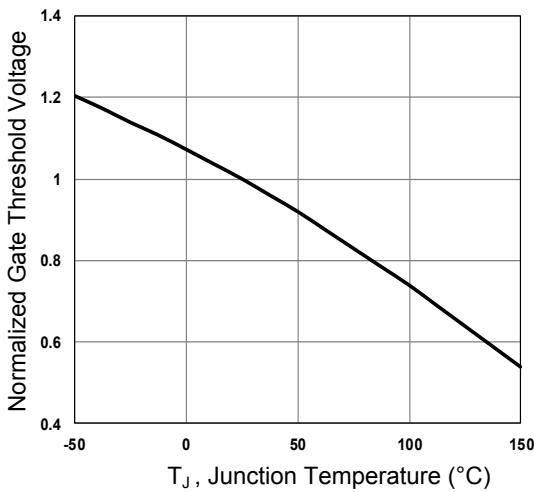


Fig.3 Normalized V_{th} vs. T_J

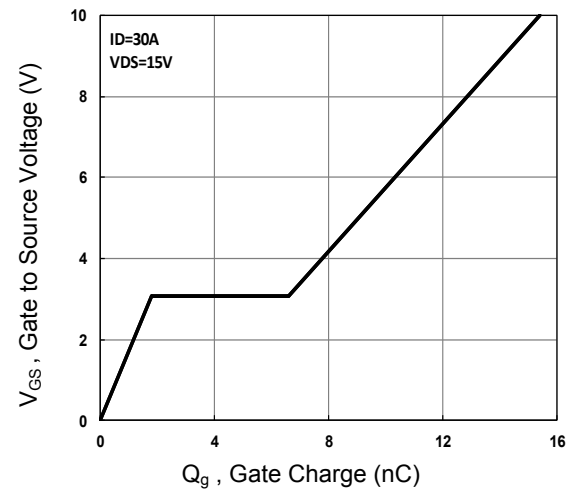


Fig.4 Gate Charge Characteristics

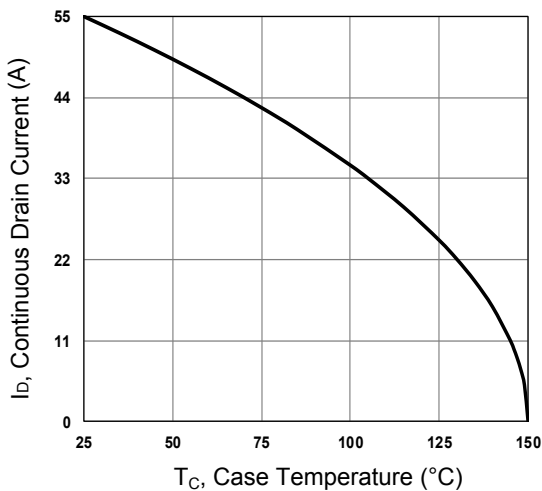


Fig.5 Continuous Drain Current vs. T_C

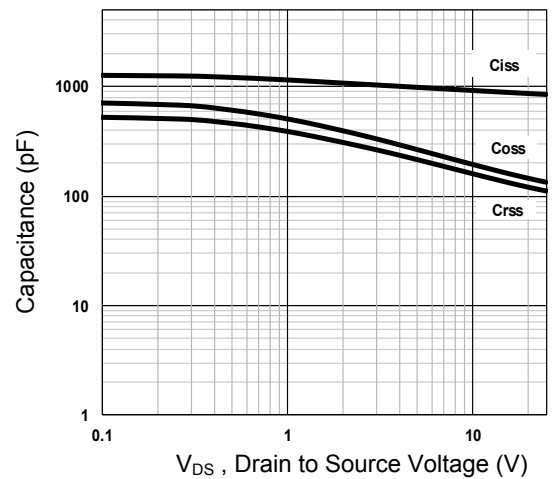


Fig.6 Capacitance Characteristics

Typical Electrical and Thermal Characteristic Curves

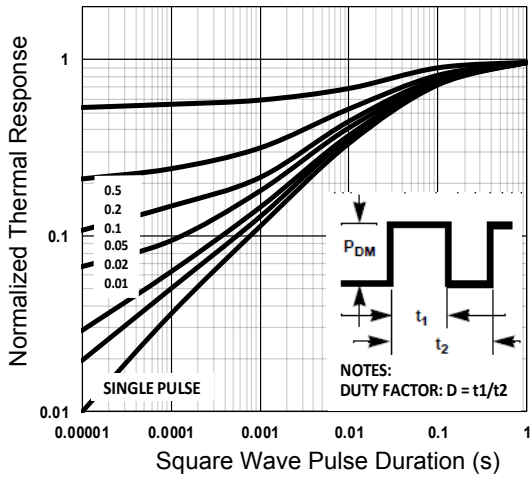


Fig.7 Normalized Transient Impedance

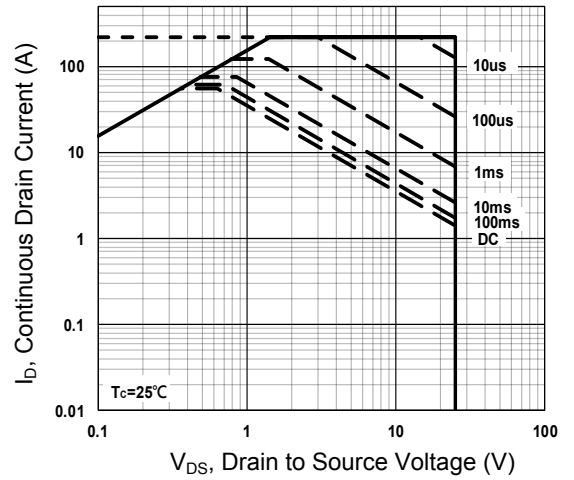


Fig.8 Maximum Safe Operation Area

Typical Electrical and Thermal Characteristic Curves

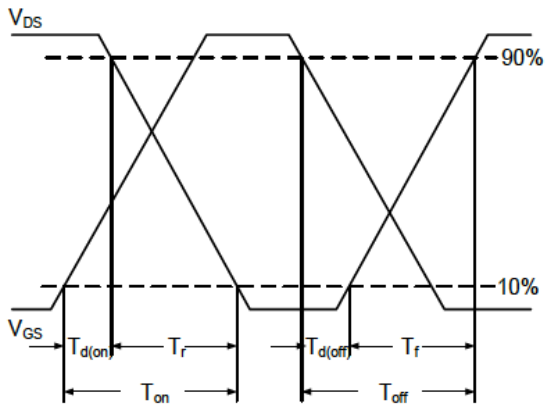


Fig.9 Switching Time Waveform

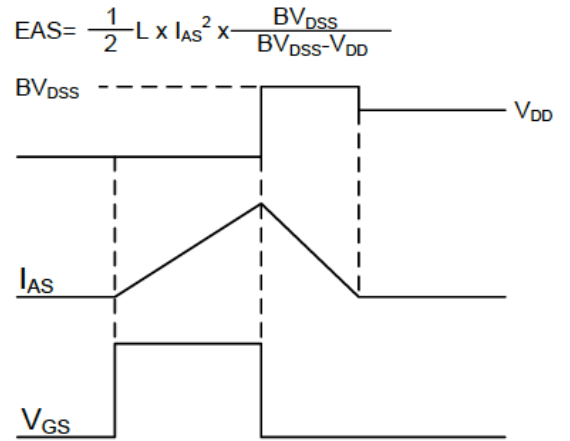
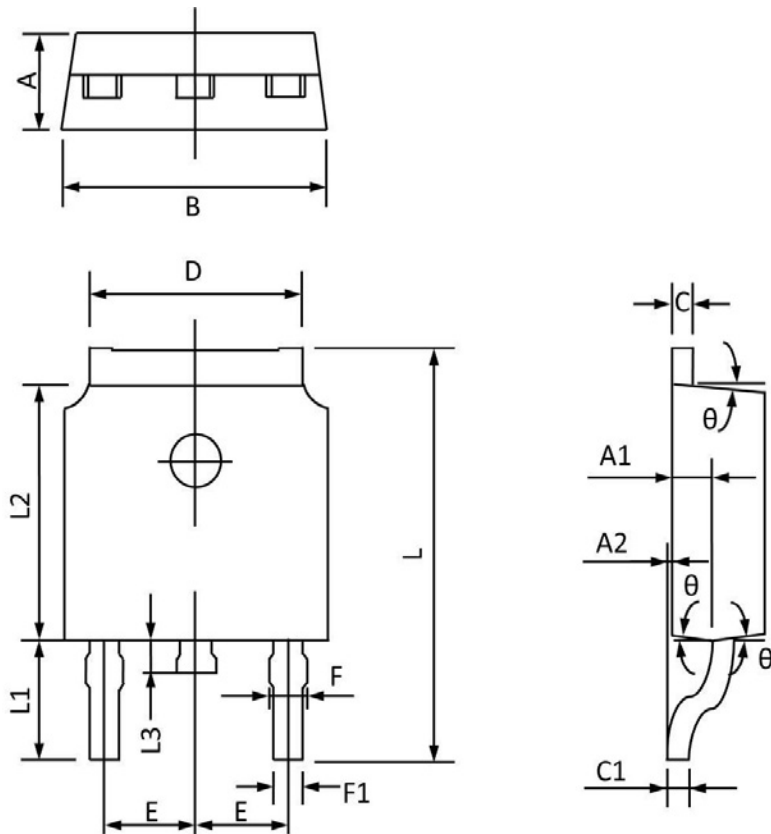


Fig.10 EAS Waveform

Package Outline Dimensions (TO-252 (DPAK))



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	2.450	2.150	0.096	0.085
A1	1.200	0.910	0.047	0.036
A2	0.150	0.000	0.006	0.000
B	6.800	6.300	0.268	0.248
C	0.580	0.350	0.023	0.014
C1	0.550	0.380	0.022	0.015
D	5.500	5.100	0.217	0.201
E	2.390	2.000	0.094	0.079
F	0.940	0.600	0.037	0.024
F1	0.860	0.500	0.034	0.020
L	10.400	9.400	0.409	0.370
L1	3.000	2.400	0.118	0.094
L2	6.200	5.300	0.244	0.209
L3	1.200	0.600	0.047	0.024
θ	9°	3°	9°	3°