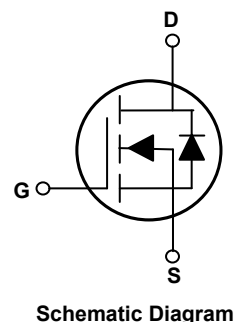
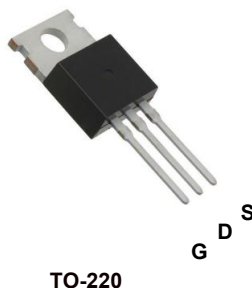


Main Product Characteristics

BV_{DSS}	100V
$R_{DS(ON)}$	3.2m Ω
I_D	140A



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 GSFH10140 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}	100	V
Gate-Source Voltage	V_{GS}	+20/-12	V
Drain Current-Continuous ($T_C=25^\circ\text{C}$)	I_D	140	A
Drain Current-Continuous ($T_C=100^\circ\text{C}$)		88	A
Drain Current-Pulsed1	I_{DM}	560	A
Single Pulse Avalanche Energy ²	E_{AS}	830	mJ
Single Pulse Avalanche Current ²	I_{AS}	129	A
Power Dissipation ($T_C=25^\circ\text{C}$)	P_D	183	W
Power Dissipation-Derate Above 25 $^\circ\text{C}$		1.47	W/ $^\circ\text{C}$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.68	$^\circ\text{C}/\text{W}$
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	100	-	-	V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =100V, V _{GS} =0V, T _J =25°C	-	-	1	μA
		V _{DS} =80V, V _{GS} =0V, T _J =85°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 =20A	-	2.8	3.2	mΩ
		V _{GS} =4.5V, I _D =10A	-	3.6	4.6	mΩ
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1.0	1.5	2.5	V
Forward Transconductance	g _{fs}	V _{DS} =10V, I _D =5A	-	27	-	S
Dynamic and Switching Characteristics						
Total Gate Charge ^{3,4}	Q _g	V _{DS} =50V, I _D =70A, V _{GS} =10V	-	145	215	nC
Gate-Source Charge ^{3,4}	Q _{gs}		-	18.1	27	
Gate-Drain Charge ^{3,4}	Q _{gd}		-	35	52	
Turn-On Delay Time ^{3,4}	t _{d(on)}	V _{DD} =50V, R _G =6Ω V _{GS} =10V, I _D =70A	-	38.4	58	nS
Rise Time ^{3,4}	t _r		-	32	48	
Turn-Off Delay Time ^{3,4}	t _{d(off)}		-	74	111	
Fall Time ^{3,4}	t _f		-	42	63	
Input Capacitance	C _{iss}	V _{DS} =50V, V _{GS} =0V, F=1MHz	-	8050	12080	pF
Output Capacitance	C _{oss}		-	1480	2220	
Reverse Transfer Capacitance	C _{rss}		-	15	23	
Gate Resistance	R _g	V _{GS} =0V, V _{DS} =0V, F=1MHz	-	0.9	-	Ω
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I _S	V _G =V _D =0V,	-	-	140	A
Pulsed Source Current	I _{SM}	Force Current	-	-	280	A
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =1A, T _J =25°C	-	-	1	V
Reverse Recovery Time	T _{rr}	V _R =100V, I _S =10A, di/dt=100A/μs, T _J =25°C	-	140	-	ns
Reverse Recovery Charge	Q _{rr}		-	420	-	nC

Note:

1. Repetitive rating: Pulsed width limited by maximum junction temperature.
2. V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=129A, 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

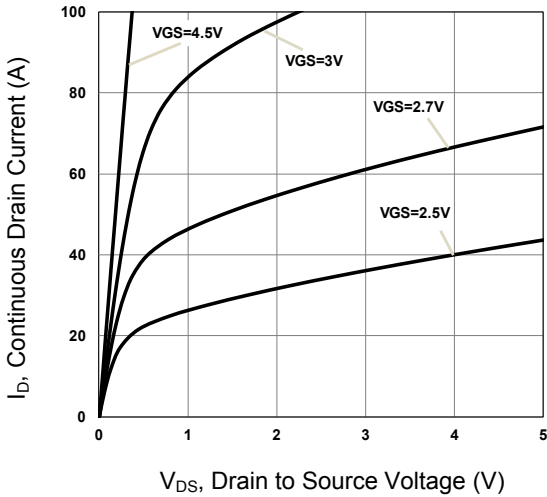


Fig.1 Typical Output Characteristics

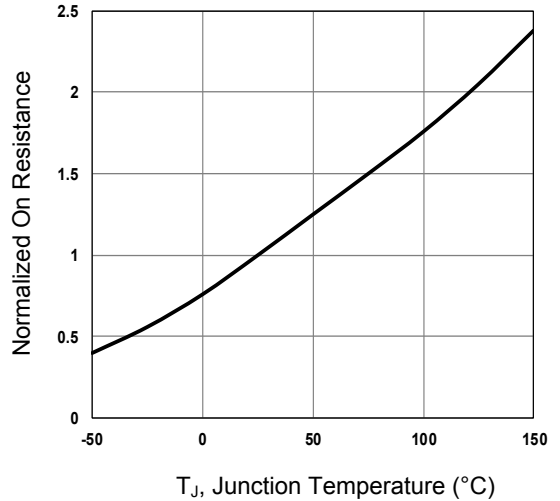


Fig.2 Normalized $R_{DS(ON)}$ vs. T_J

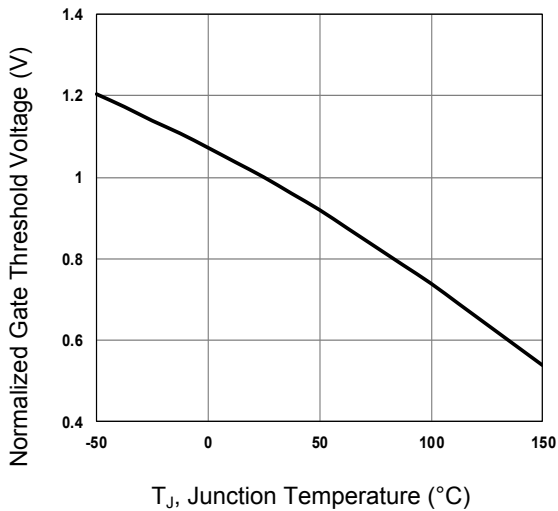


Fig.3 Normalized V_{th} vs. T_J

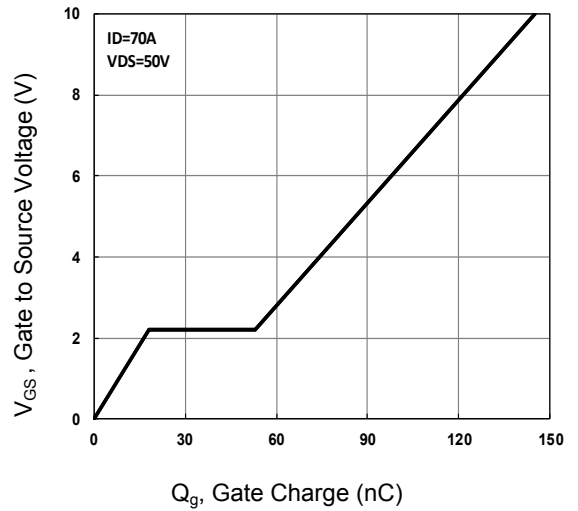


Fig.4 Gate Charge Waveform

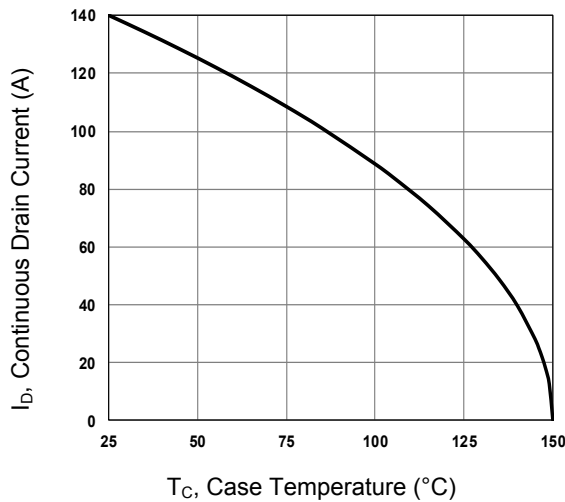


Fig.5 Continuous Drain Current vs. T_C

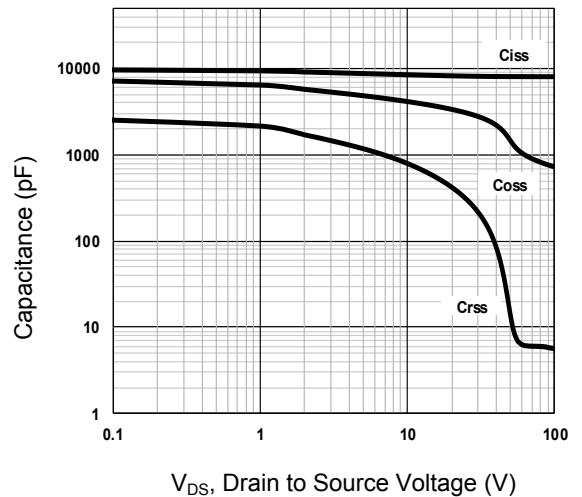


Fig.6 Capacitance Characteristics

Typical Electrical and Thermal Characteristic Curves

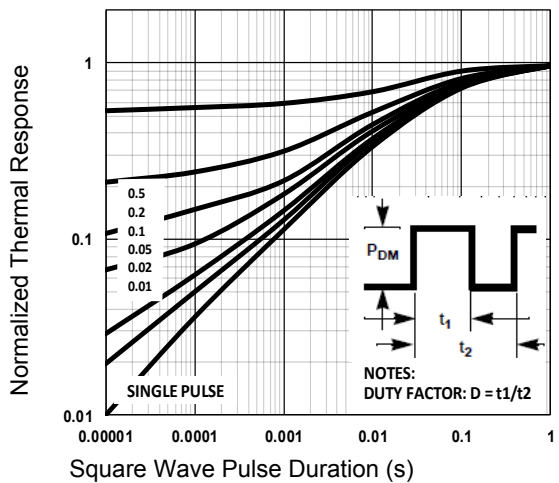


Fig.7 Normalized Transient Impedance

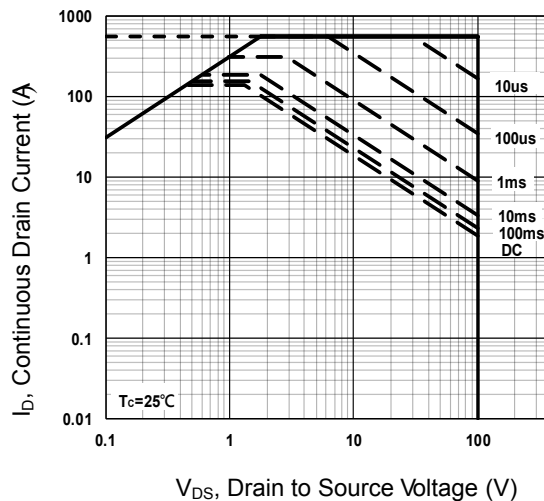


Fig.8 Maximum Safe Operation Area

Typical Electrical and Thermal Characteristic Curves

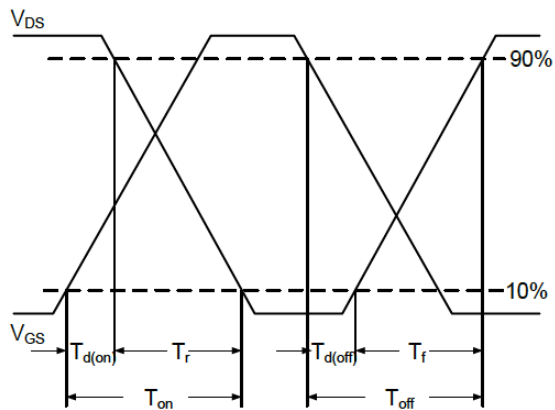


Fig.9 Switching Time Waveform

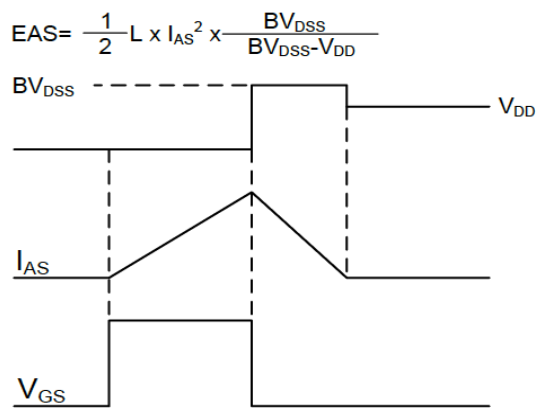
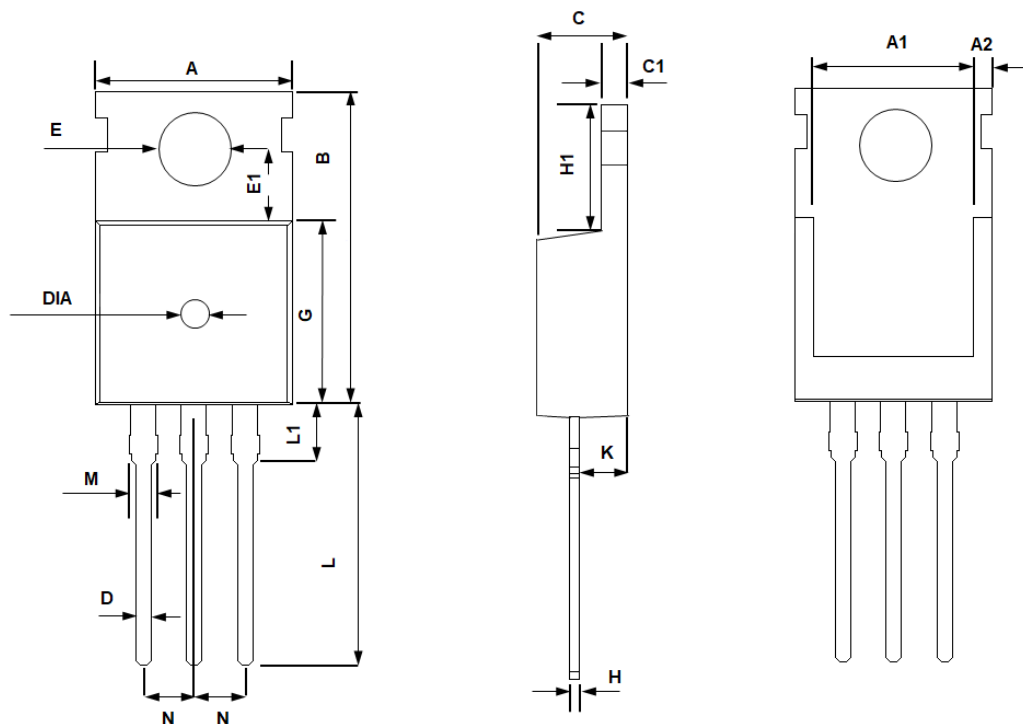


Fig.10 EAS Waveform

Package Outline Dimensions

TO220



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	10.300	9.700	0.406	0.382
A1	8.600	7.600	0.338	0.299
A2	1.250	0.800	0.049	0.031
B	16.20	14.50	0.638	0.570
C	4.750	4.280	0.187	0.169
C1	1.500	1.100	0.059	0.043
D	1.000	0.600	0.039	0.024
E	4.000	3.300	0.157	0.129
E1	3.800	3.400	0.149	0.133
G	9.300	8.400	0.366	0.343
H	0.600	0.200	0.024	0.016
H1	6.850	6.200	0.024	0.016
K	2.850	2.100	0.106	0.083
L	14.000	12.500	0.551	0.492
M	1.500	1.100	0.059	0.043
N	2.600	2.450	0.102	0.096
DIA	Φ1.5 TYP.	deep0.2 TYP.	Φ0.059 TYP.	deep0.008 TYP.