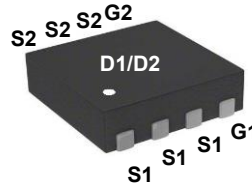
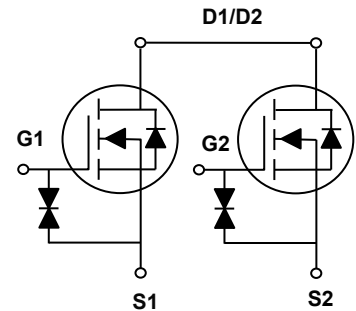


Main Product Characteristics

BV_{DSS}	20V
$R_{DS(ON)}$	6.1m Ω
I_D	40A



DFN3x3



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 GSFN0240 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}	20	V
Gate-Source Voltage	V_{GS}	± 12	V
Drain Current-Continuous ($T_C=25^\circ\text{C}$)	I_D	40	A
Drain Current-Continuous ($T_C=100^\circ\text{C}$)		25.3	A
Drain Current-Continuous ($T_A=25^\circ\text{C}$)		14	A
Drain Current-Continuous ($T_A=70^\circ\text{C}$)		11.2	A
Drain Current-Pulsed ¹ ($T_C=25^\circ\text{C}$)	I_{DM}	160	A
Power Dissipation ($T_C=25^\circ\text{C}$)	P_D	27	W
Power Dissipation-Derate above 25°C		0.22	W/ $^\circ\text{C}$
Power Dissipation ($T_A=25^\circ\text{C}$)		2	W
Power Dissipation-Derate above $T_A=25^\circ\text{C}$		0.016	W/ $^\circ\text{C}$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	4.55	$^\circ\text{C}/\text{W}$
Operating Junction Temperature Range	T_J	-55 To +150	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 To +150	$^\circ\text{C}$

Electrical Characteristics ($T_J=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On/Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	20	-	-	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=20V, V_{GS}=0V, T_J=25^\circ\text{C}$	-	-	1	μA
		$V_{DS}=16V, V_{GS}=0V, T_J=85^\circ\text{C}$	-	-	10	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 12V, V_{DS}=0V$	-	-	± 20	μA
Static Drain-Source On-Resistance ³	$R_{DS(ON)}$	$V_{GS}=4.5V, I_D=5.5A$	4.1	5.1	6.1	m Ω
		$V_{GS}=4.0V, I_D=5.5A$	4.3	5.3	6.5	m Ω
		$V_{GS}=3.7V, I_D=5.5A$	4.5	5.5	7	m Ω
		$V_{GS}=3.1V, I_D=5.5A$	4.8	5.8	7.5	m Ω
		$V_{GS}=2.5V, I_D=5.5A$	5.2	6.6	8.8	m Ω
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	0.5	0.75	1.5	V
Forward Transconductance	g_{fs}	$V_{DS}=5V, I_D=5A$	-	15	-	S
Dynamic and Switching Characteristics						
Total Gate Charge ^{2,3}	Q_g	$V_{DS}=16V, I_D=5A, V_{GS}=4.5V$	-	19.9	30	nC
Gate-Source Charge ^{2,3}	Q_{gs}		-	2.3	3.8	
Gate-Drain Charge ^{2,3}	Q_{gd}		-	8.2	12.3	
Turn-On Delay Time ^{2,3}	$t_{d(on)}$	$V_{DD}=15V, R_G=6\Omega, V_{GS}=10V, I_D=5A$	-	31	60	nS
Rise Time ^{2,3}	t_r		-	69	140	
Turn-Off Delay Time ^{2,3}	$t_{d(off)}$		-	66	132	
Fall Time ^{2,3}	t_f		-	58	119	
Input Capacitance	C_{iss}	$V_{DS}=15V, V_{GS}=0V, F=1\text{MHz}$	-	780	1180	pF
Output Capacitance	C_{oss}		-	237	356	
Reverse Transfer Capacitance	C_{rss}		-	90	136	
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I_S	$V_G=V_D=0V, \text{Force Current}$	-	-	40	A
Pulsed Source Current	I_{SM}		-	-	80	A
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=1A, T_J=25^\circ\text{C}$	-	-	1	V
Reverse Recovery Time	t_{rr}	$V_R=20V, I_S=5A, di/dt=100A/\mu s, T_J=25^\circ\text{C}$	-	665	-	nS
Reverse Recovery Charge	Q_{rr}		-	8.95	-	μC

Note:

1. Repetitive rating: Pulsed width limited by maximum junction temperature.
2. Pulse test: pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
3. Essentially independent of operation temperature.

Typical Electrical and Thermal Characteristic Curves

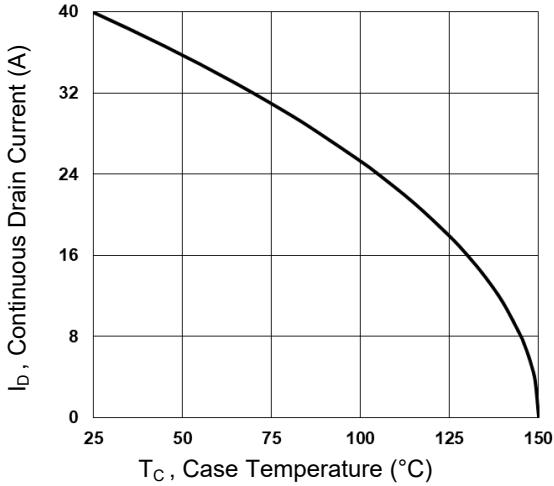


Figure 1. Continuous Drain Current vs. T_c

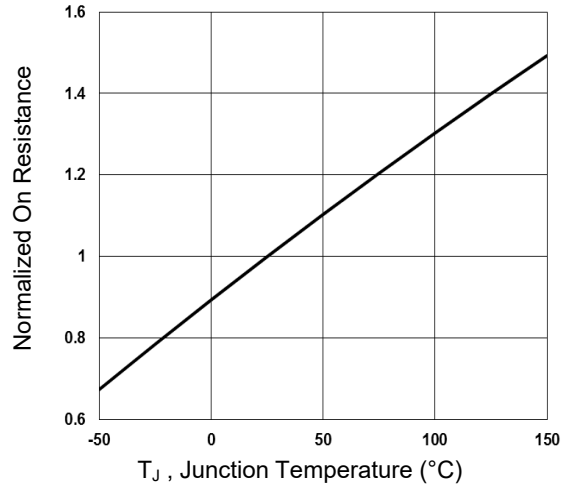


Figure 2. Normalized R_{DSON} vs. T_j

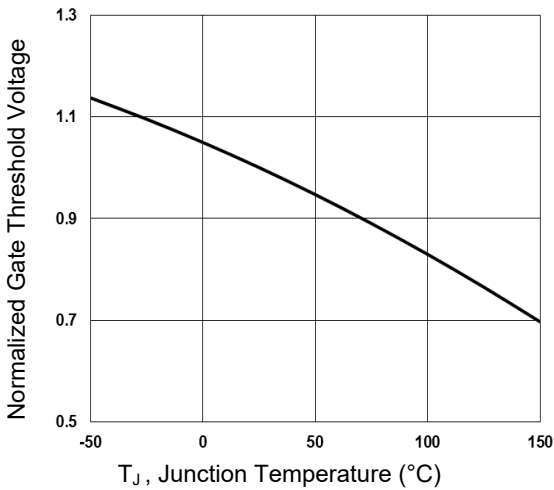


Figure 3. Normalized V_{th} vs. T_j

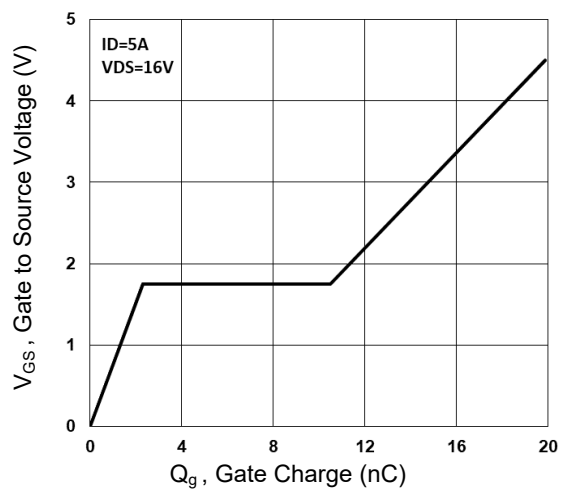


Figure 4. Gate Charge Waveform

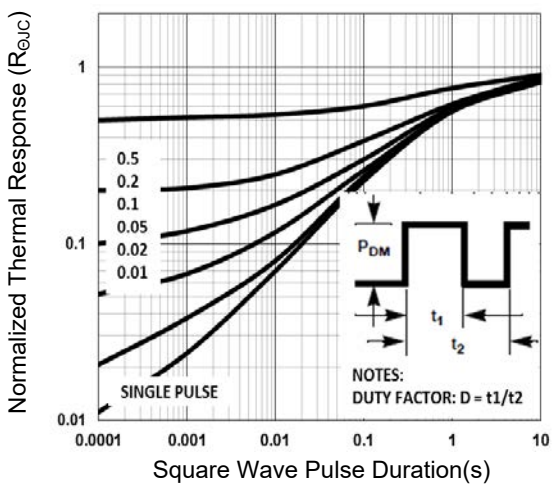


Figure 5. Normalized Transient Response

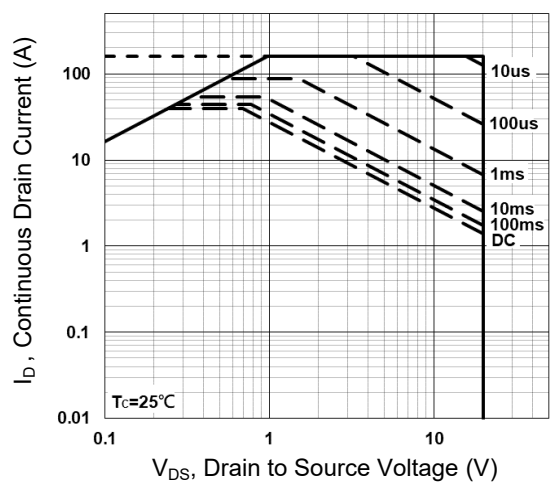


Figure 6. Maximum Safe Operation Area

Typical Electrical and Thermal Characteristic Curves

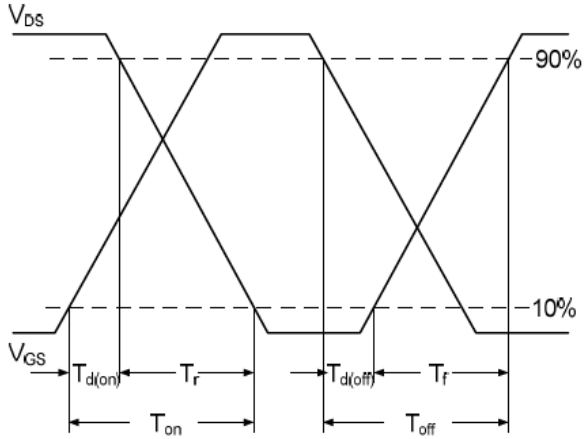


Figure 7. Switching Time Waveform

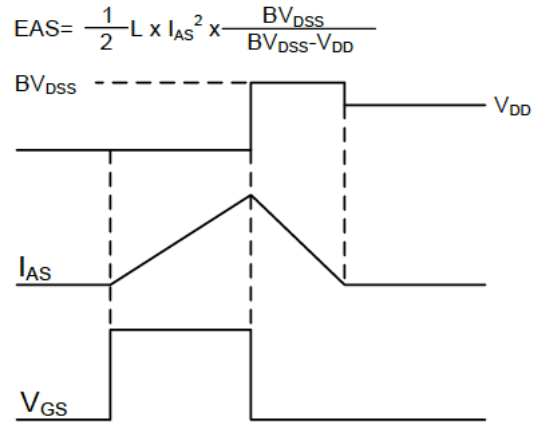
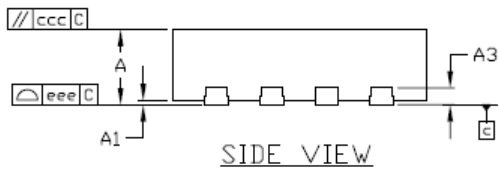
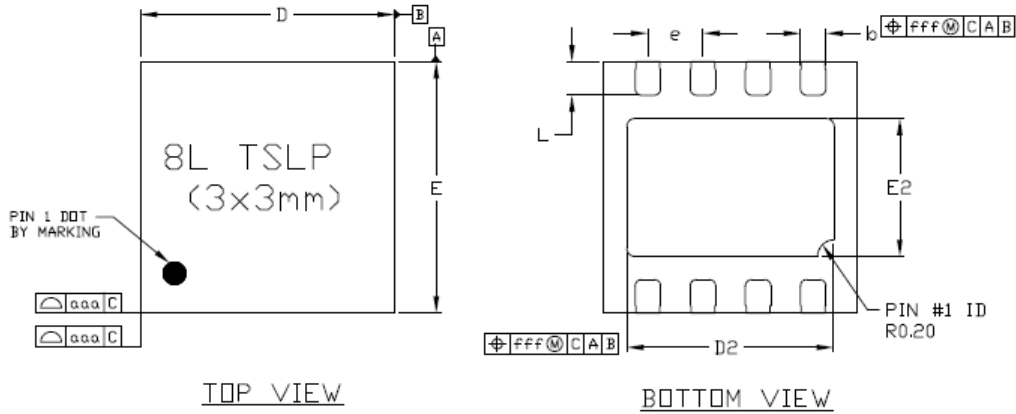


Figure 8. EAS Waveform

Package Outline Dimensions (DFN3x3)



Notes

1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DIMENSIONING AND TOLERANCING PER JEDEC MO-220.

Symbol	Dimensions In Millimeters		
	Min	Nom	Max
A	0.700	0.750	0.800
A1	-	-	0.050
A3	0.203Ref.		
D	2.950	3.000	3.050
E	2.950	3.000	3.050
D2	2.400	2.450	2.500
E2	1.600	1.650	1.700
b	0.250	0.300	0.350
e	0.650BSC		
L	0.350	0.400	0.450
aaa	0.010		
bbb	0.010		
ccc	0.010		
ddd	0.050		
eee	0.080		