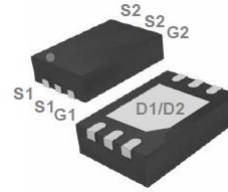
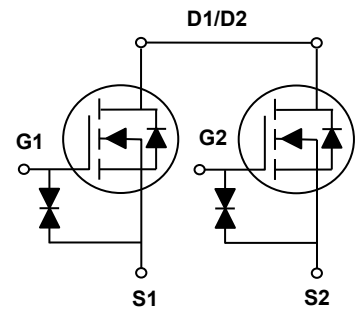


### Main Product Characteristics

$BV_{DSS}$	20V
$R_{DS(ON)}$	6.7m $\Omega$
$I_D$	32A



DFN2X3



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 GSFN0232 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	$V_{GS}$	$\pm 12$	V
Drain Current-Continuous( $T_A=25^\circ\text{C}$ )	$I_D$	32	A
Drain Current-Continuous( $T_A=70^\circ\text{C}$ )		20.2	A
Drain Current-Pulsed <sup>1</sup>	$I_{DM}$	128	A
Power Dissipation( $T_C=25^\circ\text{C}$ )	$P_D$	20	W
Power Dissipation-Derate Above 25 $^\circ\text{C}$		0.16	W/ $^\circ\text{C}$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	6.1	$^\circ\text{C/W}$
Storage Temperature Range	$T_{STG}$	-55 To +150	$^\circ\text{C}$
Operating Junction Temperature Range	$T_J$	-55 To +150	$^\circ\text{C}$

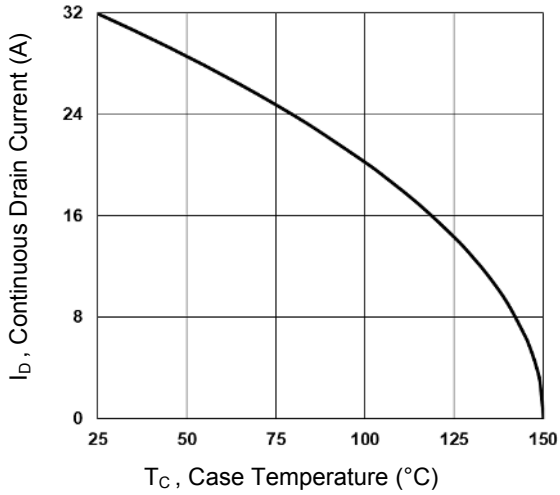
### Electrical Characteristics ( $T_J=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>Off Characteristics</b>						
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	$\mu A$
		$V_{DS}=16V, V_{GS}=0V, T_J=85^{\circ}\text{C}$	-	-	10	$\mu A$
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 12V, V_{DS}=0V$	-	-	$\pm 20$	nA
<b>On Characteristics</b>						
Static Drain-Source On-Resistance <sup>3</sup>	$R_{DS(ON)}$	$V_{GS}=4.5V, I_D=5.5A$	4.5	5.6	6.7	m $\Omega$
		$V_{GS}=4.0V, I_D=5.5A$	4.8	5.8	7.2	
		$V_{GS}=3.7V, I_D=2.4A$	5	6	7.6	
		$V_{GS}=3.1V, I_D=2.4A$	5.5	6.5	8.2	
		$V_{GS}=2.5V, I_D=2.4A$	6	7.4	9.6	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.5	0.75	1.5	V
Forward Transconductance	$g_{FS}$	$V_{DS}=5V, I_D=5A$	-	15	-	S
<b>Dynamic and Switching Characteristics</b>						
Total Gate Charge <sup>2,3</sup>	$Q_g$	$V_{DS}=16V, I_D=5A, V_{GS}=4.5V$	-	19.9	30	nC
Gate-Source Charge <sup>2,3</sup>	$Q_{gs}$		-	2.3	3.8	
Gate-Drain Charge <sup>2,3</sup>	$Q_{gd}$		-	8.2	12.3	
Turn-On Delay Time <sup>2,3</sup>	$t_{d(on)}$	$V_{DD}=15V, R_G=6\Omega, V_{GS}=10V, I_D=5A$	-	31	60	nS
Rise Time <sup>2,3</sup>	$t_r$		-	69	140	
Turn-Off Delay Time <sup>2,3</sup>	$t_{d(off)}$		-	66	132	
Fall Time <sup>2,3</sup>	$t_f$		-	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	
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
Continuous Source Current	$I_S$	$V_G=V_D=0V,$ Force Current	-	-	32	A
Pulsed Source Current	$I_{SM}$		-	-	64	A
Diode Forward Voltage <sup>2</sup>	$V_{SD}$	$V_{GS}=0V, I_S=1A, T_J=25^{\circ}\text{C}$	-	-	1	V
Reverse Recovery Time	$T_{rr}$	$V_R=20V, I_S=5A$ $di/dt=100A/\mu s$	-	670	-	nS
Reverse Recovery Charge	$Q_{rr}$	$T_J=25^{\circ}\text{C}$	-	9.8	-	$\mu C$

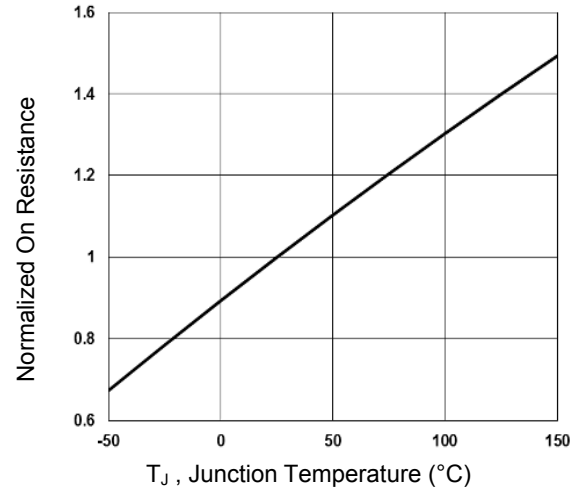
Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width  $\leq 300\mu s$  , duty cycle  $\leq 2\%$ .
3. Essentially independent of operating temperature.

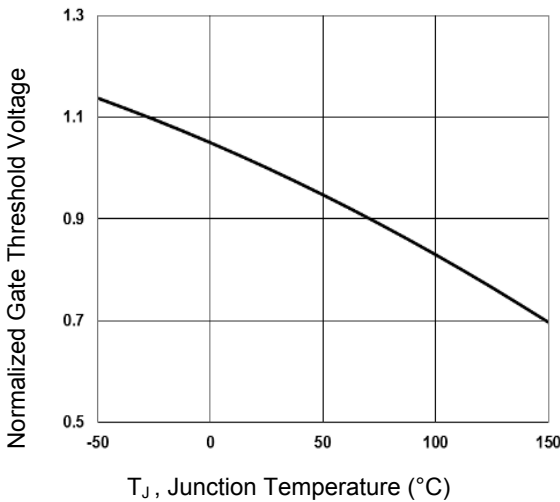
### Typical Electrical and Thermal Characteristic Curves



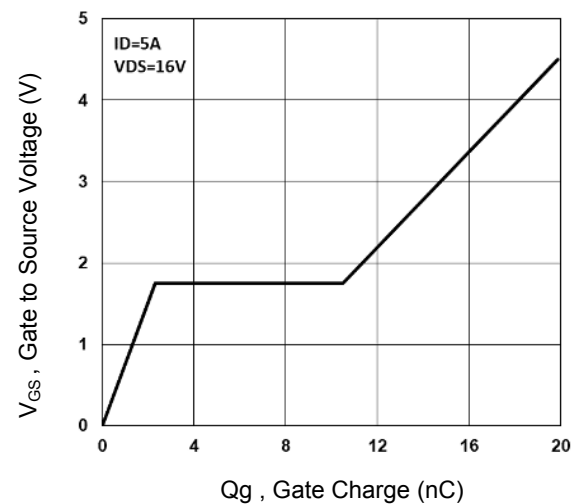
**Figure 1. Continuous Drain Current vs.  $T_C$**



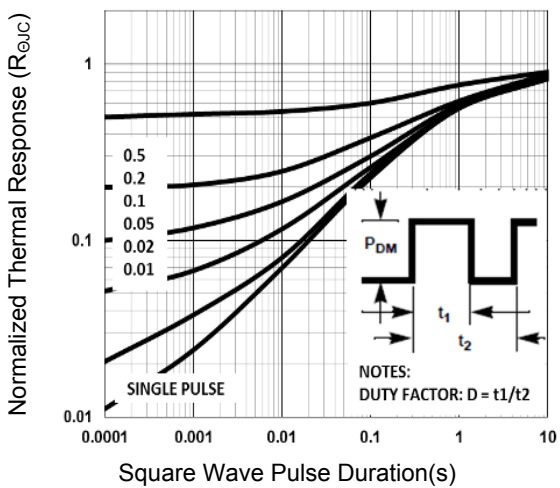
**Figure 2. Normalized  $R_{DS(on)}$  vs.  $T_J$**



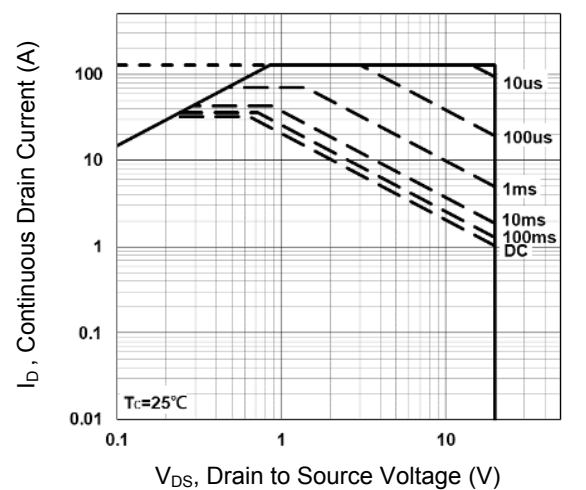
**Figure 3. Normalized  $V_{th}$  vs.  $T_J$**



**Figure 4. Gate Charge Characteristics**



**Figure 5. Normalized Transient Response**



**Figure 6. Maximum Safe Operation Area**

## Typical Electrical and Thermal Characteristic Curves

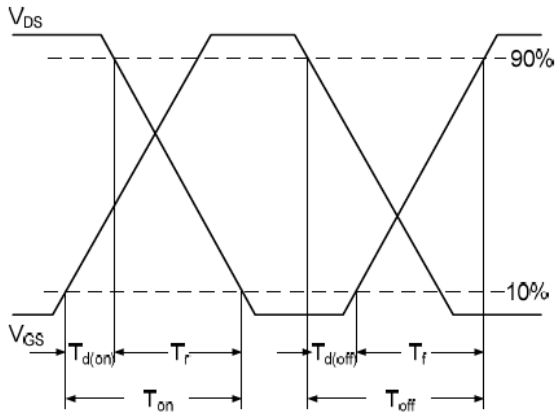


Figure 7. Switching Time Waveform

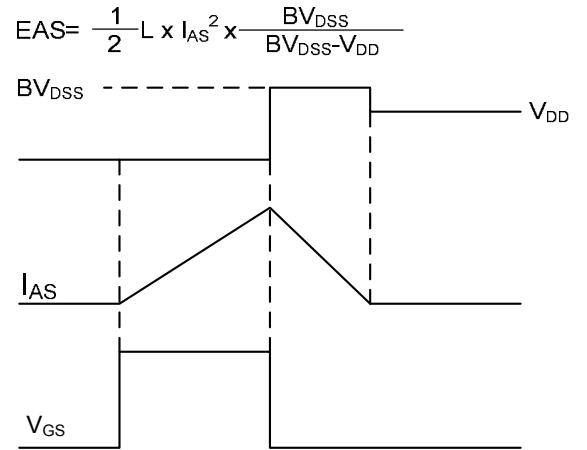
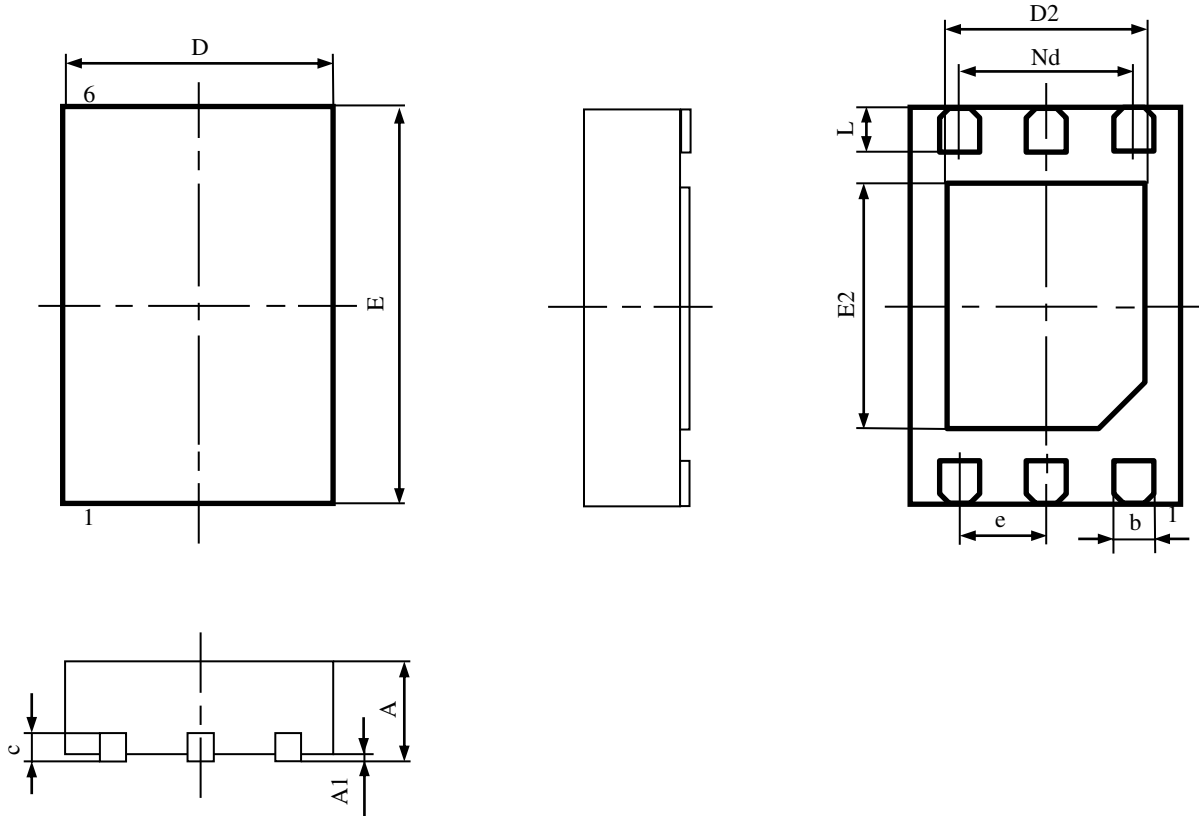


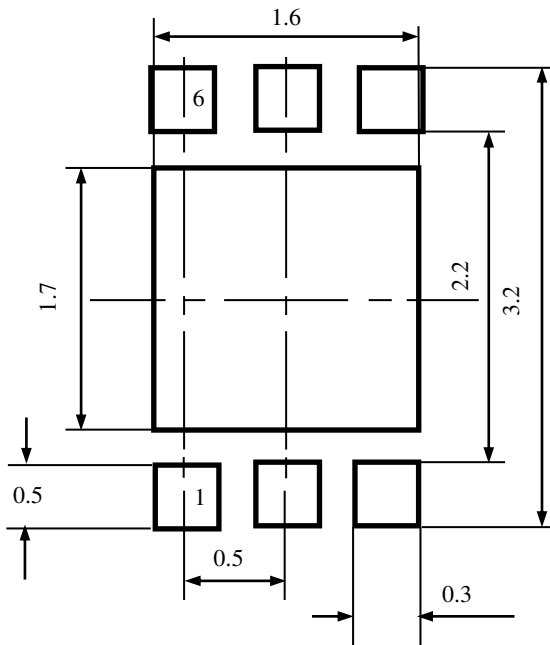
Figure 8.  $E_{AS}$  Waveform

**Package Outline Dimensions (DFN2X3)**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	0.800	0.700	0.031	0.028
A1	0.050	0.02typ.	0.002	0.001typ.
b	0.350	0.200	0.014	0.008
c	0.250	0.180	0.010	0.007
D	2.100	1.900	0.083	0.075
D2	1.600	1.400	0.063	0.055
e	0.5BSC		0.02BSC	
Nd	1.0BSC		0.04BSC	
E	3.100	2.900	0.122	0.114
E2	1.750	1.650	0.069	0.065
L	0.400	0.300	0.016	0.012

## Recommended Pad Layout (DFN2X3)



unit : mm