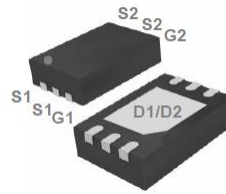
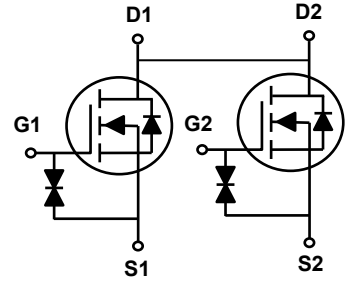


**Main Product Characteristics**

$BV_{DSS}$	20V
$R_{DS(ON)}$	14mΩ
$I_D$	8.4A



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 GSFN0210 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** ( $T_C=25^{\circ}C$  unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	$V_{DS}$	20	V
Gate-Source Voltage	$V_{GS}$	±10	V
Drain Current-Continuous ( $T_A=25^{\circ}C$ )	$I_D$	8.4	A
Drain Current-Continuous ( $T_A=70^{\circ}C$ )		6.7	
Drain Current-Pulsed <sup>1</sup>	$I_{DM}$	33.6	A
Power Dissipation ( $T_C=25^{\circ}C$ )	$P_D$	1.56	W
Power Dissipation-Derate above 25°C		0.013	
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	80	°C/W
Operating Junction Temperature Range	$T_J$	-55 To +150	°C
Storage Temperature Range	$T_{STG}$	-55 To +150	°C

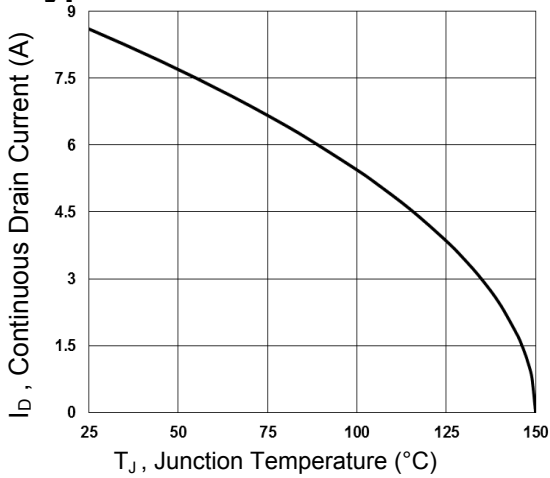
**Electrical Characteristics** ( $T_J=25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>On/Off Characteristics</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	20	-	-	V
$BV_{DSS}$ Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to $25^\circ\text{C}$ , $I_D=1mA$	-	0.02	-	$V/^\circ\text{C}$
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=20V, V_{GS}=0V,$ $T_J=25^\circ\text{C}$	-	-	1	$\mu A$
		$V_{DS}=16V, V_{GS}=0V,$ $T_J=125^\circ\text{C}$	-	-	10	$\mu A$
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 10V, V_{DS}=0V$	-	-	$\pm 10$	$\mu A$
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=4.5V, I_D=5A$	8.5	11	14	m $\Omega$
		$V_{GS}=4.2V, I_D=5A$	8.5	11.2	14.2	
		$V_{GS}=3.7V, I_D=4A$	8.5	11.5	14.5	
		$V_{GS}=3.0V, I_D=4A$	9	12	15.2	
		$V_{GS}=2.5V, I_D=3A$	9.5	12.5	16	
		$V_{GS}=1.8V, I_D=2A$	11	15.5	20	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	0.3	0.6	1	V
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}$		-	2	-	$mV/^\circ\text{C}$
Forward Transconductance	$g_{fs}$	$V_{DS}=10V, I_S=5A$	-	13	-	S
<b>Dynamic and Switching Characteristics</b>						
Total Gate Charge <sup>2,3</sup>	$Q_g$	$V_{DS}=10V, I_D=5A,$ $V_{GS}=4.5V$	-	16.9	26	nC
Gate-Source Charge <sup>2,3</sup>	$Q_{gs}$		-	1.1	3	
Gate-Drain Charge <sup>2,3</sup>	$Q_{gd}$		-	4	7	
Turn-On Delay Time <sup>2,3</sup>	$t_{d(on)}$	$V_{DD}=10V, R_G=25\Omega,$ $V_{GS}=4.5V, I_D=1A$	-	6.8	13	nS
Rise Time <sup>2,3</sup>	$t_r$		-	20	38	
Turn-Off Delay Time <sup>2,3</sup>	$t_{d(off)}$		-	41.8	79	
Fall Time <sup>2,3</sup>	$t_f$		-	13.2	25	
Input Capacitance	$C_{iss}$	$V_{DS}=10V, V_{GS}=0V,$ $F=1MHz$	-	1020	1480	pF
Output Capacitance	$C_{oss}$		-	160	240	
Reverse Transfer Capacitance	$C_{rss}$		-	110	160	
Gate Resistance	$R_g$	$V_{GS}=0V, V_{DS}=0V,$ $F=1MHz$	-	2	4	$\Omega$
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
Continuous Source Current	$I_S$	$V_G=V_D=0V,$ Force Current	-	-	8.4	A
Pulsed Source Current	$I_{SM}$		-	-	16.8	A
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=1A,$ $T_J=25^\circ\text{C}$	-	-	1	V

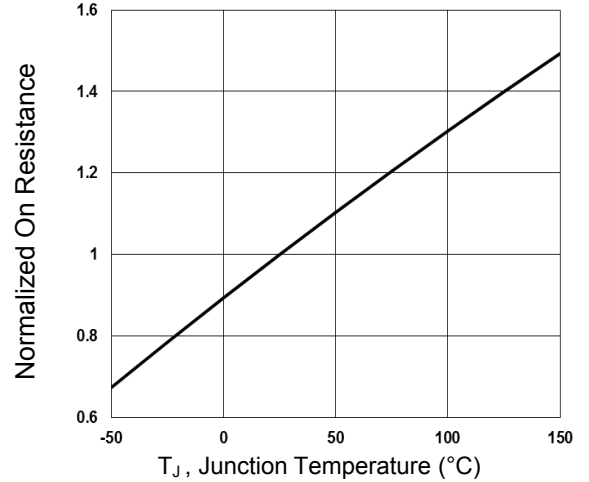
Note:

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 operating temperature.

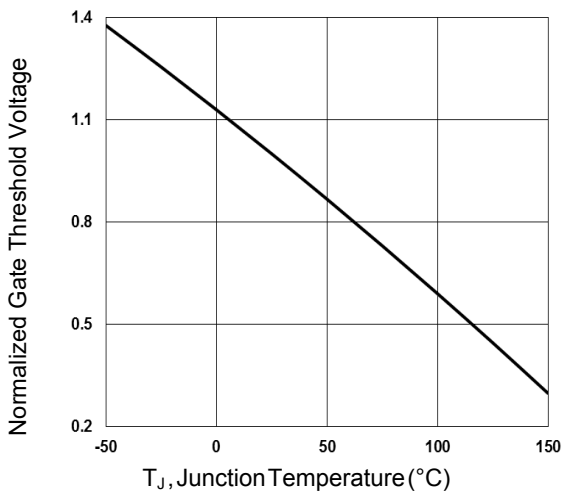
**Typical Electrical and Thermal Characteristic Curves**



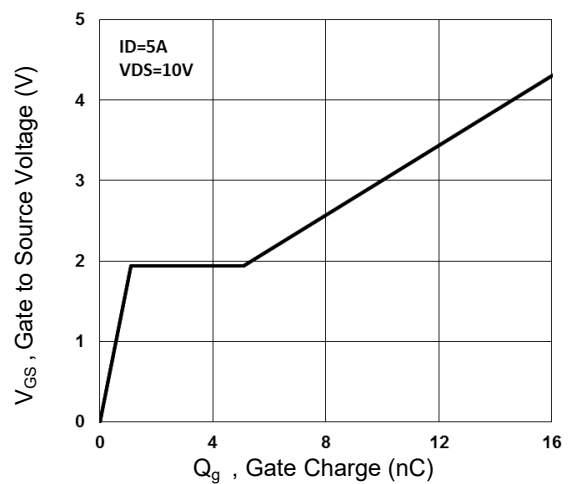
**Figure.1 Continuous Drain Current vs.  $T_J$**



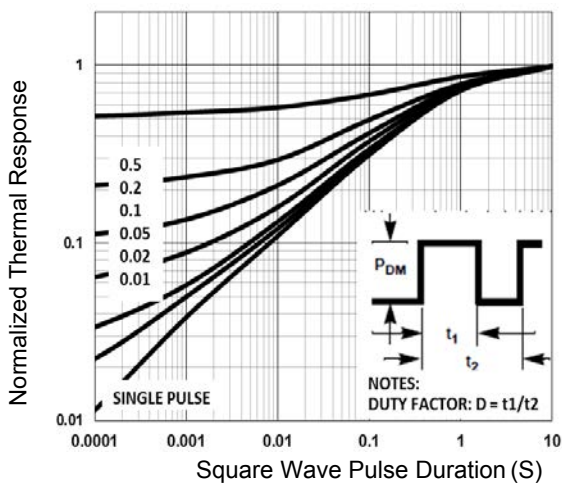
**Figure.2 Normalized  $R_{DS(ON)}$  vs.  $T_J$**



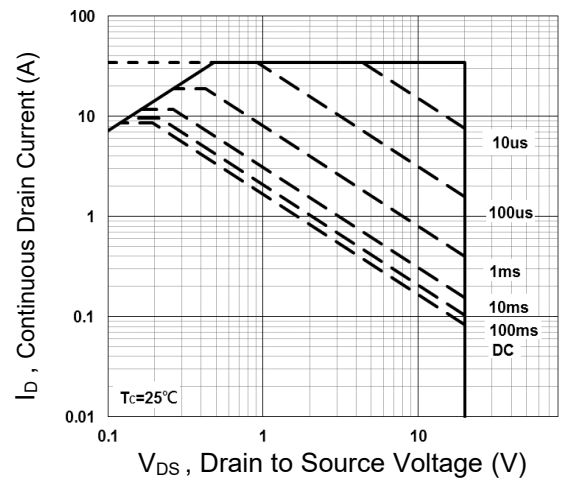
**Figure.3 Normalized  $V_{th}$  vs.  $T_J$**



**Figure.4 Gate Charge Waveform**



**Figure.5 Normalized Transient Response**



**Figure.6 Maximum Safe Operation Area**

### Typical Electrical and Thermal Characteristic Curves

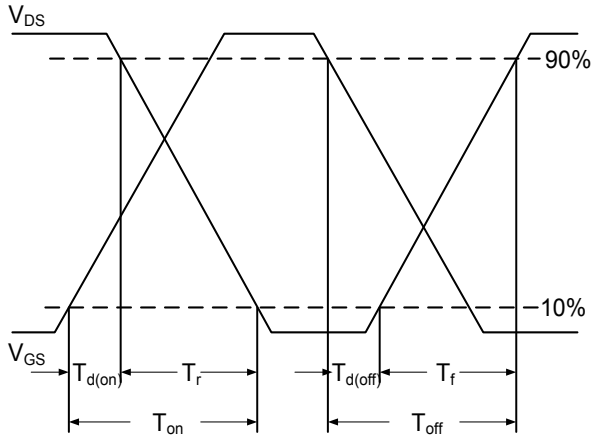


Figure.7 Switching Time Waveform

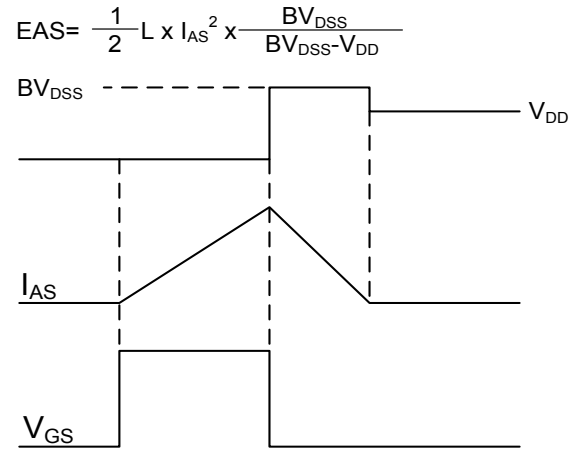
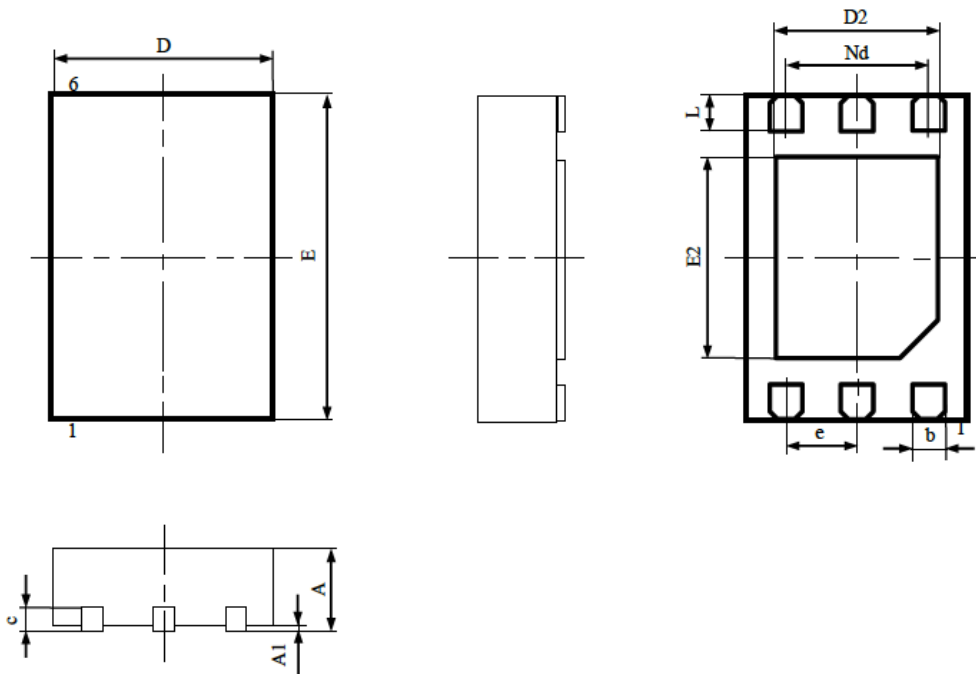


Figure. 8  $E_{AS}$  Waveform

**Package Outline Dimensions**

**DFN2X3 Dual NEP**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	0.800	0.700	0.031	0.028
A1	0.050	<b>0.02typ.</b>	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