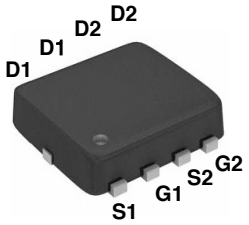
GOOD-ARK SEMICONDUCTOR

GSFN0208

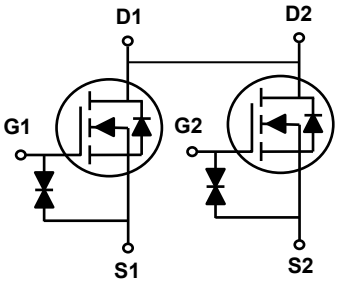
20V Dual N-Channel MOSFETs

Main Product Characteristics

BV_{DSS}	20V
$R_{DS(ON)}$	14mΩ
I_D	8.6A



PPAK3X3 Dual NEP



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 GSFN0208 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°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°C)	I_D	8.6	A
Drain Current-Continuous (T_A=70°C)		6.8	
Drain Current-Pulsed[1]	I_{DM}	34.4	A
Power Dissipation (T_C=25°C)	P_D	1.67	W
Power Dissipation-Derate above 25°C		0.014	W/°C
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	75	°C/W
Storage Temperature Range	T_{STG}	-55 To +150	°C
Operating Junction Temperature Range	T_J	-55 To +150	°C

Electrical Characteristics (T_J=25°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=250μA	20	-	-	V
BV_{DSS} Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to 25°C, I_D=1mA	-	0.02	-	V/°C
Drain-Source Leakage Current	I_{DSS}	V_{DS}=20V, V_{GS}=0V, T_J=25°C	-	-	1	μA
		V_{DS}=16V, V_{GS}=0V, T_J=125°C	-	-	10	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±10V, V_{DS}=0V	-	-	±10	μA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=4.5V, I_D=5A	8.5	11	14	mΩ
		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}=3V, 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=250μA	0.3	0.6	1	V
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}$		-	2	-	mV/°C
Forward Transconductance	g_{fs}	V_{DS}=10V, I_S=5A	-	13	-	S
Dynamic and Switching Characteristics						
Total Gate Charge[2,3]	Q_g	V_{DS}=10V, I_D=5A, V_{GS}=4.5V	-	16.9	26	nC
Gate-Source Charge[2,3]	Q_{gs}		-	1.1	3	
Gate-Drain Charge[2,3]	Q_{gd}		-	4	7	
Turn-On Delay Time[2,3]	$t_{d(on)}$	V_{DD}=10V, R_G=25Ω, V_{GS}=4.5V, I_D=1A	-	6.8	13	nS
Rise Time[2,3]	t_r		-	20	38	
Turn-Off Delay Time[2,3]	$t_{d(off)}$		-	41.8	79	
Fall Time[2,3]	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	Ω
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I_S	V_G=V_D=0V, Force Current	-	-	8.6	A
Pulsed Source Current	I_{SM}		-	-	17.2	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=1A, T_J=25°C	-	-	1	V

Note:

1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
2. Pulse test: pulse width ≦ 300us, duty cycle ≦ 2 %.
3. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristic Curves

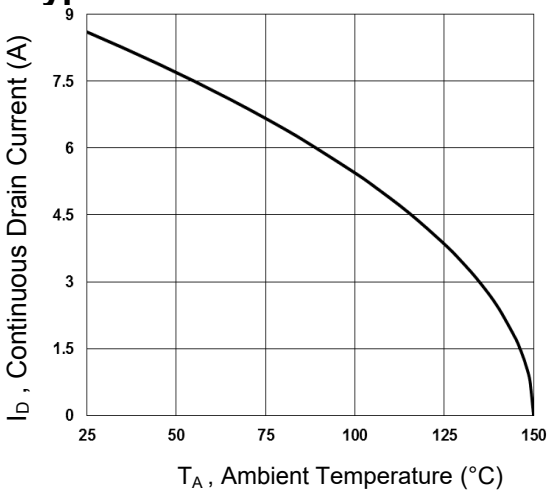


Figure.1 Continuous Drain Current vs. T_A

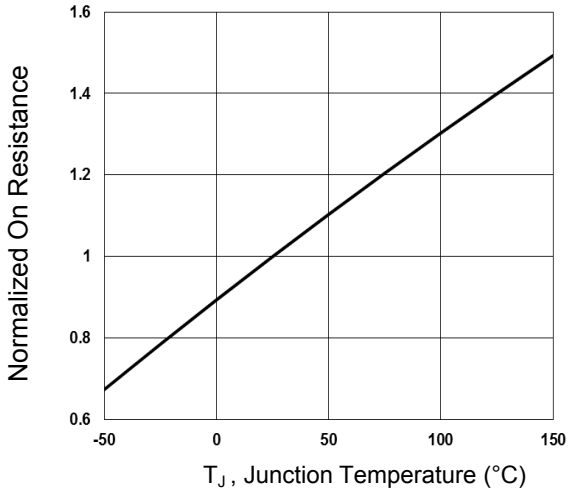


Figure.2 Normalized $R_{DS(ON)}$ vs. T_J

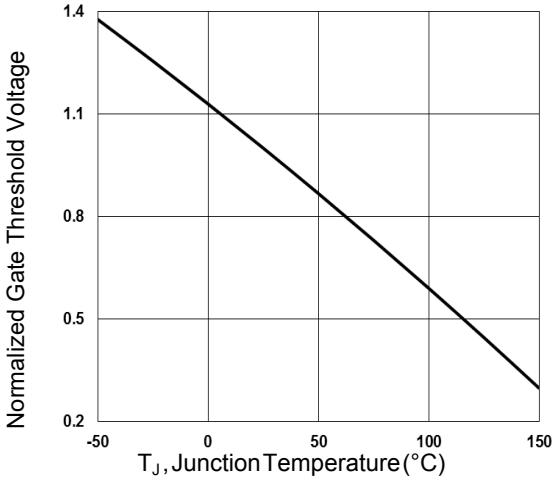


Figure.3 Normalized V_{th} vs. T_J

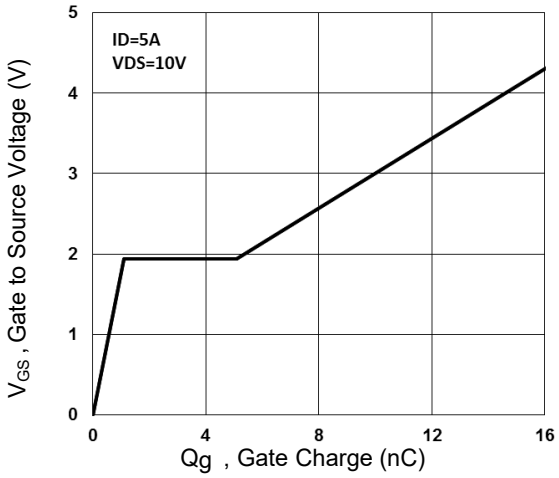


Figure.4 Gate Charge Waveform

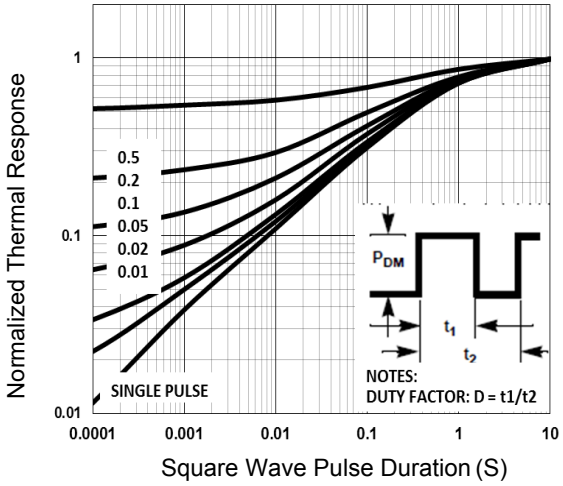


Figure.5 Normalized Transient Response

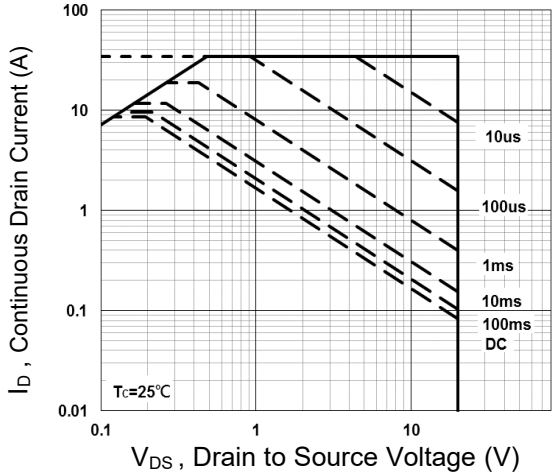


Figure.6 Maximum Safe Operation Area

Typical Electrical and Thermal Characteristic Curves

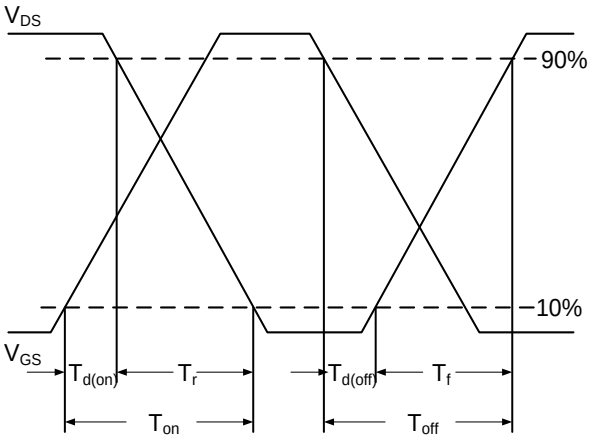


Figure.7 Switching Time Waveform

$$EAS = \frac{1}{2} L \times I_{AS}^2 \times \frac{BV_{DSS}}{BV_{DSS}-V_{DD}}$$

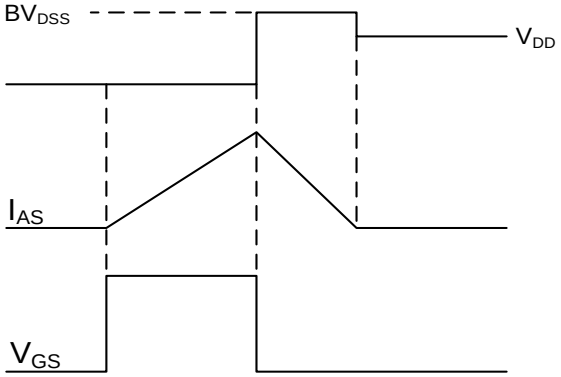
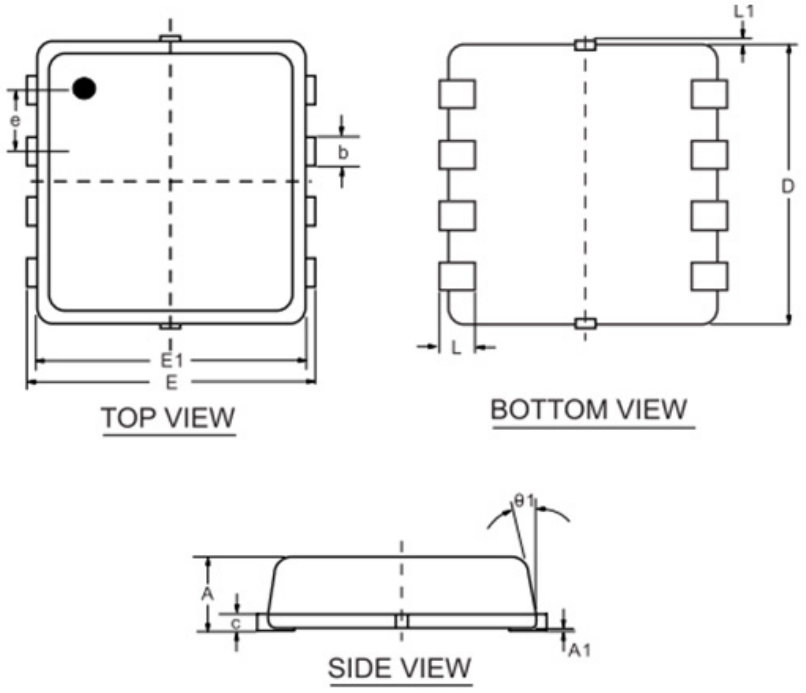


Figure. 8 EAS Waveform

Package Outline Dimensions

PPAK3X3 Dual NEP



Symbol	Dimensions In Millimeters		
	Min	Typ	Max
A	0.700	0.800	0.900
A1	0.000	---	0.050
b	0.250	0.300	0.350
c	0.080	0.152	0.250
D	2.800	2.900	3.000
E	2.700	2.800	2.900
E1	2.200	2.300	2.400
e	0.65BSC		
L	0.200	0.375	0.450
L1	0.00	---	0.10
Θ1	0°	10°	12°