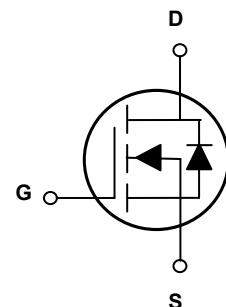
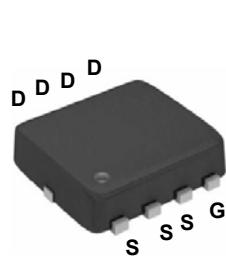


Main Product Characteristics

BV _{DSS}	150V
R _{DS(ON)}	45mΩ
I _D	20A



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

PPAK3x3

Schematic Diagram



Description

The GSFN1520 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 supplies 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}	150	V
Gate-Source Voltage	V _{GS}	±20	V
Drain Current-Continuous ($T_C=25^\circ\text{C}$)	I _D	20	A
Drain Current-Continuous ($T_C=100^\circ\text{C}$)		12.5	
Drain Current-Pulsed ¹	I _{DM}	80	A
Power Dissipation ($T_C=25^\circ\text{C}$)	P _D	63	W
Power Dissipation-Derate above 25°C		0.51	W/°C
Thermal Resistance, Junction-to-Ambient	R _{θJA}	62	°C/W
Thermal Resistance, Junction-to-Case	R _{θJC}	1.98	°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
On / Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{\text{GS}}=0\text{V}, I_{\text{D}}=250\mu\text{A}$	150	-	-	V
Drain-Source Leakage Current	I_{DSS}	$V_{\text{DS}}=120\text{V}, V_{\text{GS}}=0\text{V}, T_J=25^\circ\text{C}$	-	-	1	μA
		$V_{\text{DS}}=120\text{V}, V_{\text{GS}}=0\text{V}, T_J=85^\circ\text{C}$	-	-	10	μA
Gate-Source Leakage Current	I_{GSS}	$V_{\text{GS}}=\pm 20\text{V}, V_{\text{DS}}=0\text{V}$	-	-	± 100	nA
Static Drain-Source On-Resistance ²	$R_{\text{DS}(\text{ON})}$	$V_{\text{GS}}=10\text{V}, I_{\text{D}}=4\text{A}$	-	37	45	$\text{m}\Omega$
Gate Threshold Voltage	$V_{\text{GS}(\text{th})}$	$V_{\text{GS}}=V_{\text{DS}}, I_{\text{D}}=250\mu\text{A}$	2.5	3.5	4.5	V
Forward Transconductance	g_{fs}	$V_{\text{DS}}=10\text{V}, I_{\text{D}}=3\text{A}$	-	5	-	S
Dynamic and Switching Characteristics						
Total Gate Charge ^{2,3}	Q_g	$V_{\text{DS}}=75\text{V}, I_{\text{D}}=10\text{A}$ $V_{\text{GS}}=10\text{V}$	-	17.4	-	nC
Gate-Source Charge ^{2,3}	Q_{gs}		-	2.7	-	
Gate-Drain Charge ^{2,3}	Q_{gd}		-	6.1	-	
Turn-On Delay Time ^{2,3}	$t_{\text{d}(\text{on})}$	$V_{\text{DD}}=75\text{V}, R_{\text{G}}=6\Omega$ $V_{\text{GS}}=10\text{V}, I_{\text{D}}=10\text{A}$	-	4.6	-	nS
Rise Time ^{2,3}	t_r		-	15	-	
Turn-Off Delay Time ^{2,3}	$t_{\text{d}(\text{off})}$		-	27	-	
Fall Time ^{2,3}	t_f		-	8	-	
Input Capacitance	C_{iss}	$V_{\text{DS}}=75\text{V}, V_{\text{GS}}=0\text{V}, F=1\text{MHz}$	-	835	-	pF
Output Capacitance	C_{oss}		-	75	-	
Reverse Transfer Capacitance	C_{rss}		-	7	-	
Gate Resistance	R_g	$V_{\text{GS}}=0\text{V}, V_{\text{DS}}=0\text{V}, F=1\text{MHz}$	-	0.8	-	Ω
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I_s	$V_G=V_D=0\text{V}, \text{Force Current}$	-	-	20	A
Pulsed Source Current	I_{SM}		-	-	40	A
Diode Forward Voltage	V_{SD}	$V_{\text{GS}}=0\text{V}, I_s=1\text{A}, T_J=25^\circ\text{C}$	-	-	1	V
Reverse Recovery Time	t_{rr}	$V_R=100\text{V}, I_s=10\text{A}$ $dI/dt=100\text{A}/\mu\text{s}$ $T_J=25^\circ\text{C}$	-	70	-	nS
Reverse Recovery Charge	Q_{rr}		-	250	-	nC

Note:

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

Typical Electrical and Thermal Characteristic Curves

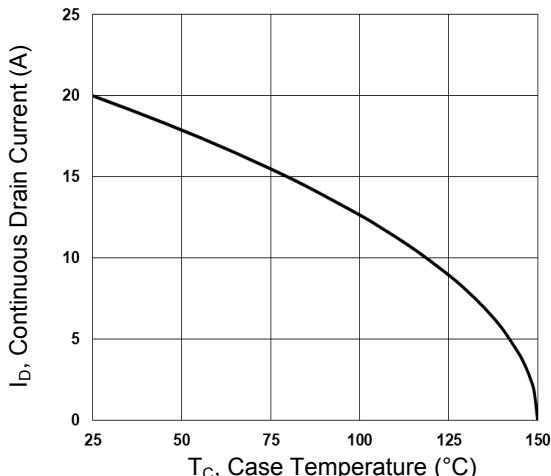


Figure 1. Continuous Drain Current vs. T_c

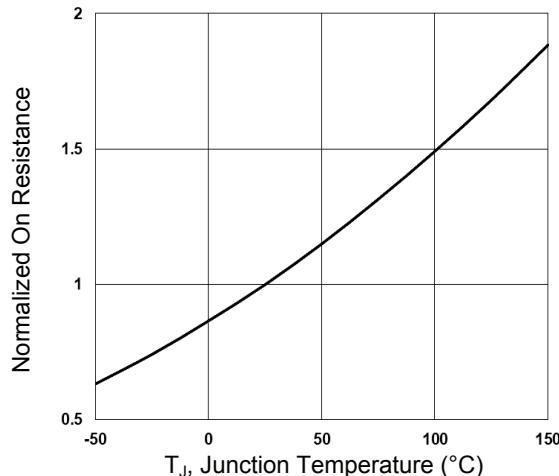


Figure 2. Normalized R_{DS(on)} vs. T_j

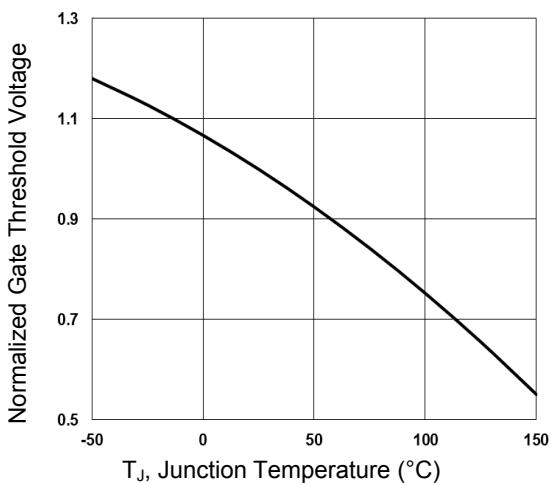


Figure 3. Normalized V_{th} vs. T_j

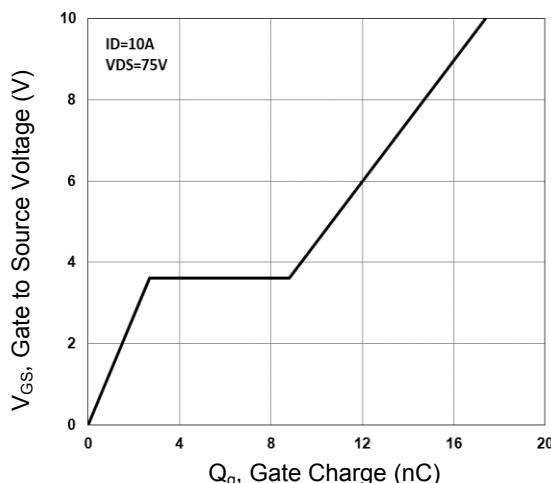


Figure 4. Gate Charge Characteristics

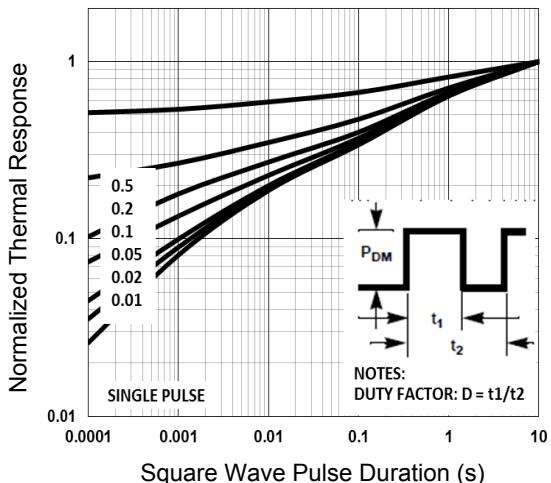


Figure 5. Normalized Transient Impedance

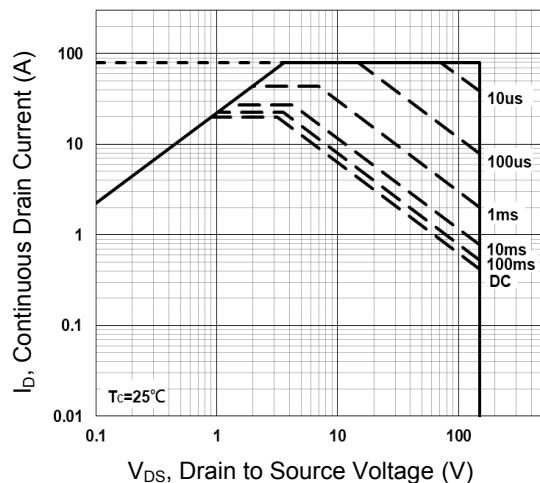


Figure 6. Maximum Safe Operation Area

Typical Electrical and Thermal Characteristic Curves

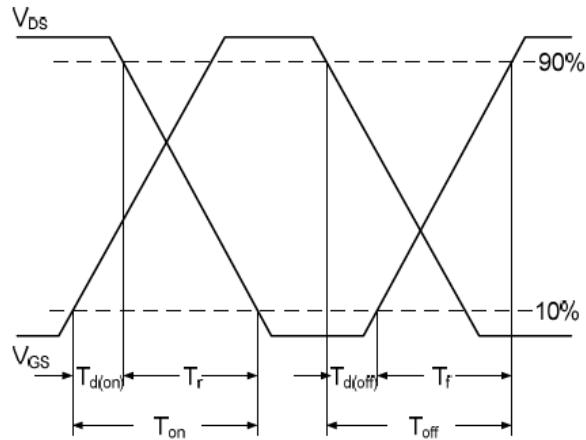


Figure 7. Switching Time Waveform

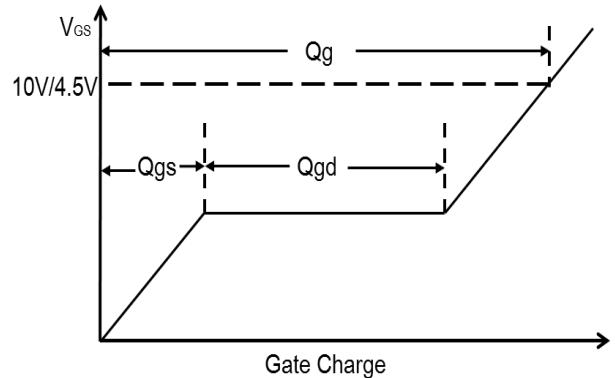
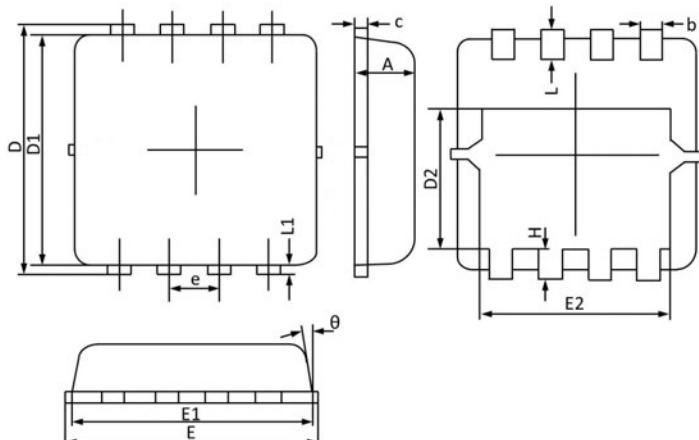


Figure 8. Gate Charge Waveform

Package Outline Dimensions (PPAK3x3)



Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	0.700	0.900	0.028	0.035
b	0.250	0.350	0.010	0.014
C	0.100	0.250	0.004	0.010
D	3.050	3.500	0.120	0.138
D1	2.900	3.200	0.114	0.126
D2	1.350	1.950	0.053	0.077
E	3.000	3.400	0.118	0.134
E1	2.900	3.300	0.114	0.130
E2	2.350	2.600	0.093	0.102
e	0.650 BSC		0.026 BSC	
H	0.300	0.750	0.012	0.030
L	0.300	0.600	0.012	0.024
L1	0.060	0.200	0.002	0.008
θ	6°	14°	6°	14°

Recommended Pad Layout

