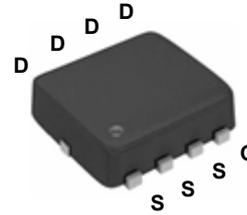
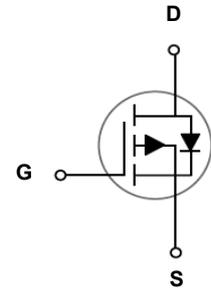


Main Product Characteristics

BV_{DSS}	-30V
$R_{DS(ON)}$	6m Ω
I_D	-80A



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 GSFN0381 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°C unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V _{DS}	-30	V
Gate-Source Voltage	V _{GS}	±20	V
Drain Current-Continuous (T _C =25°C)	I _D	-80	A
Drain Current-Continuous (T _C =100°C)		-51	
Drain Current-Pulsed ¹	I _{DM}	-320	A
Single Pulse Avalanche Energy ²	E _{AS}	218	mJ
Single Pulse Avalanche Current ²	I _{AS}	-66	A
Power Dissipation (T _C =25°C)	P _D	70	W
Power Dissipation-Derate above 25°C		0.56	
Thermal Resistance, Junction-to-Ambient	R _{θJA}	62	°C/W
Thermal Resistance Junction to Case	R _{θJC}	1.78	°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°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	-30	-	-	V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =-30V, V _{GS} =0V, T _J =25°C	-	-	-1	μA
		V _{DS} =-24V, V _{GS} =0V, T _J =125°C	-	-	-10	μA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =-10V, I _D =-12A	-	5.1	6	mΩ
		V _{GS} =-4.5V, I _D =-8A	-	7.4	9.6	
Gate Threshold Voltage	V _{GS(th)}	V _{GS} =V _{DS} , I _D =-250μA	-1.2	-1.6	-2.5	V
Forward Transconductance	g _{fs}	V _{DS} =-10V, I _D =-3A	-	13	-	S
Dynamic and Switching Characteristics						
Total Gate Charge ^{3,4}	Q _g	V _{DS} =-15V, I _D =-40A, V _{GS} =-10V	-	63	100	nC
Gate-Source Charge ^{3,4}	Q _{gs}		-	13	20	
Gate-Drain Charge ^{3,4}	Q _{gd}		-	9.5	15	
Turn-On Delay Time ^{3,4}	t _{d(on)}	V _{DD} =-15V, R _G =6Ω, V _{GS} =-10V, I _D =-40A	-	8	12	nS
Rise Time ^{3,4}	t _r		-	10	15	
Turn-Off Delay Time ^{3,4}	t _{d(off)}		-	15	25	
Fall Time ^{3,4}	t _f		-	20	30	
Input Capacitance	C _{iss}	V _{DS} =-15V, V _{GS} =0V, F=1MHz	-	3980	6000	pF
Output Capacitance	C _{oss}		-	520	800	
Reverse Transfer Capacitance	C _{rss}		-	360	550	
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I _S	V _G =V _D =0V, Force Current	-	-	-80	A
Pulsed Source Current	I _{SM}		-	-	-160	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. V_{DD}=-25V, V_{GS}=-10V, L=0.1mH, I_{AS}=-66A, R_G=25Ω, starting T_J=25°C.
3. Pulse test: pulse width ≤ 300us, duty cycle ≤ 2%.
4. Essentially independent of operation temperature.

Typical Electrical and Thermal Characteristic Curves

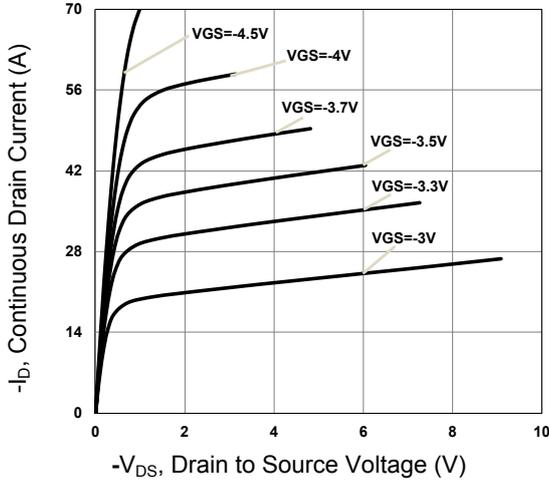


Figure 1. Typical Output Characteristics

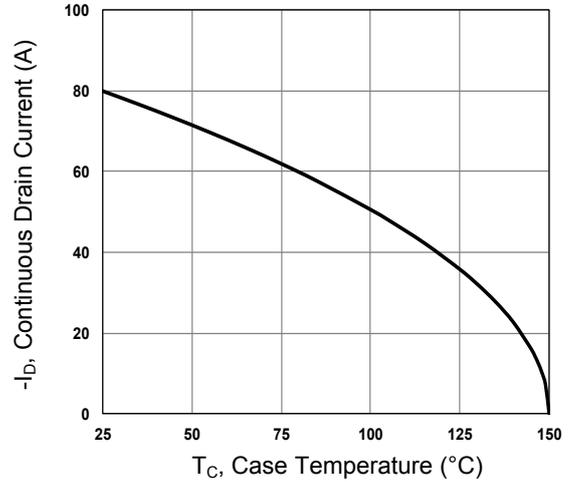


Figure 2. Continuous Drain Current vs. T_C

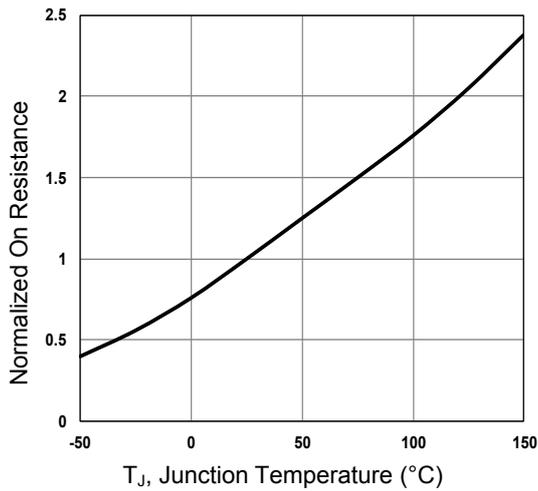


Figure 3. Normalized $R_{DS(ON)}$ vs. T_J

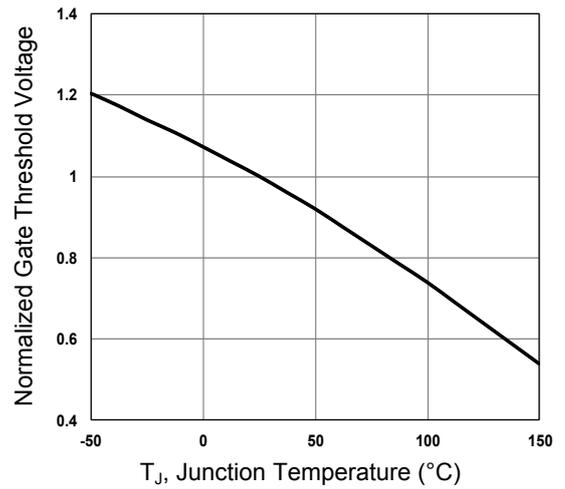


Figure 4. Normalized V_{th} vs. T_J

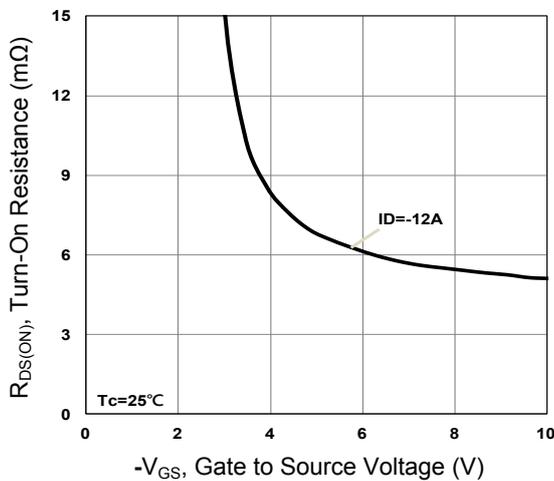


Figure 5. Turn-On Resistance vs. V_{GS}

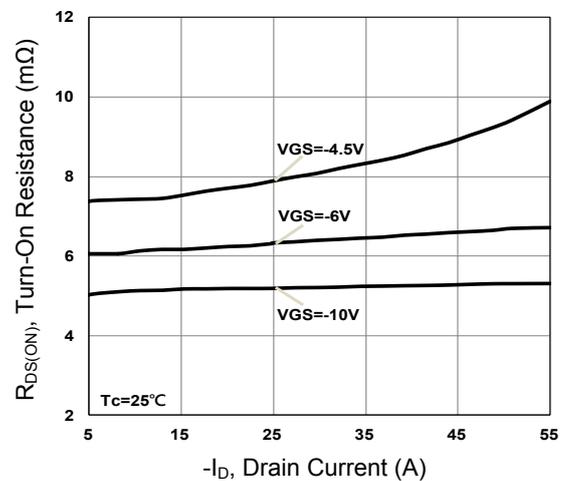


Figure 6. Turn-On Resistance vs. I_D

Typical Electrical and Thermal Characteristic Curves

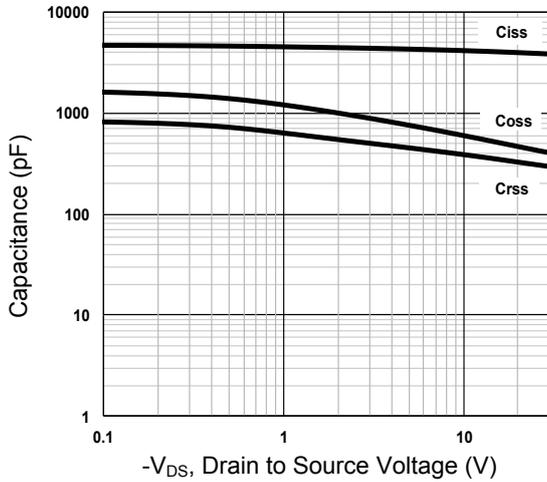


Figure 7. Capacitance Characteristics

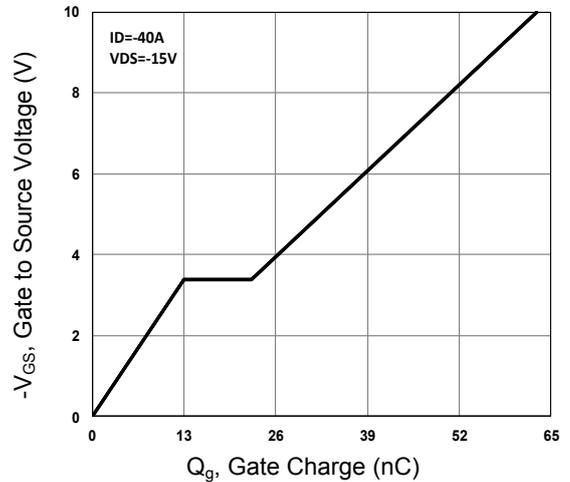


Figure 8. Gate Charge Characteristics

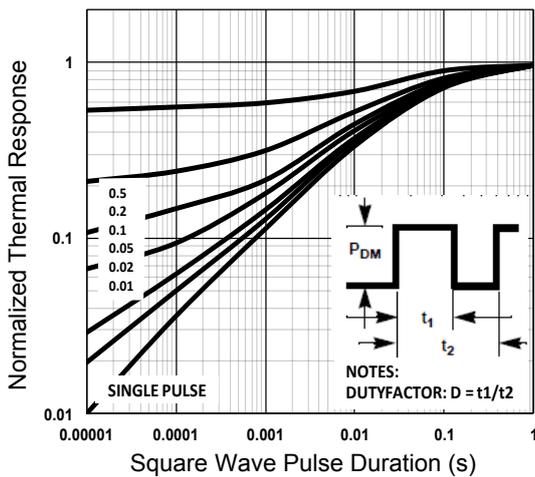


Figure 9. Normalized Transient Impedance

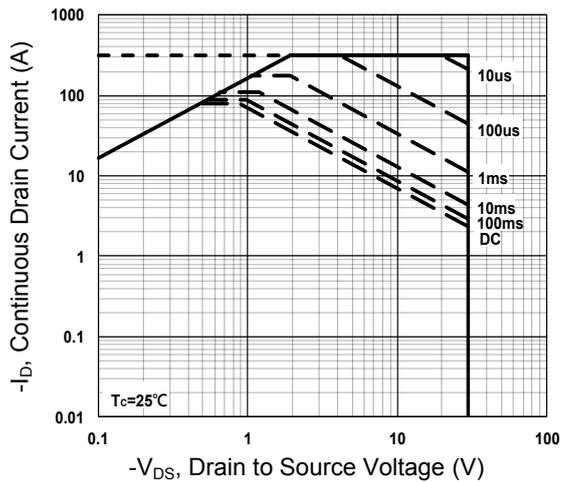


Figure 10. Maximum Safe Operation Area

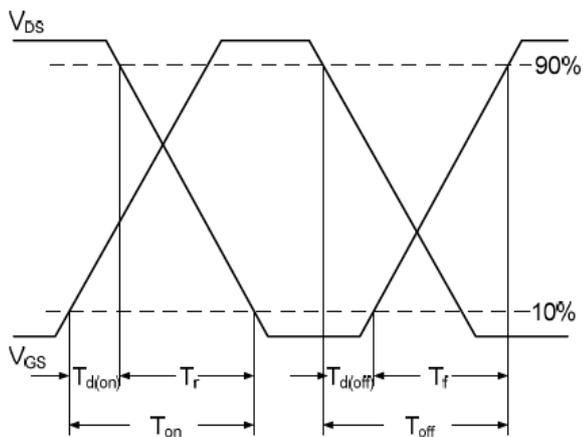


Figure 11. Switching Time Waveform

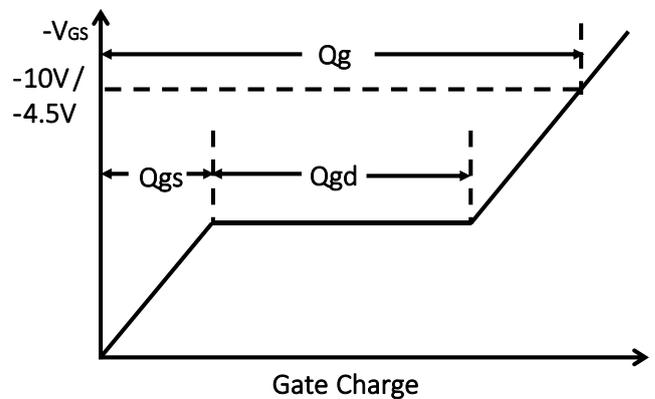
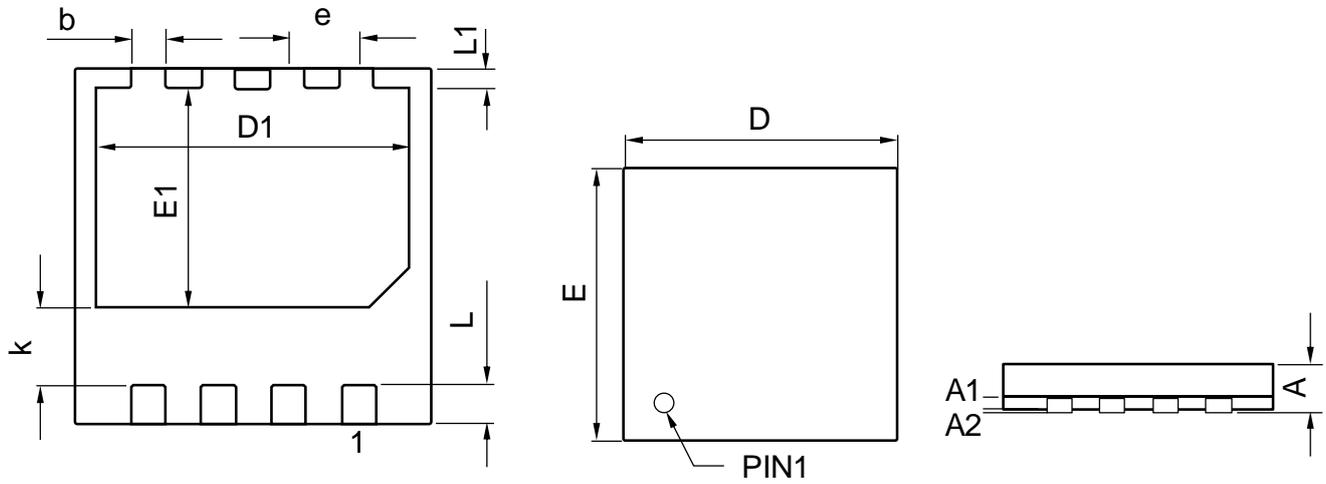


Figure 12. Gate Charge Waveform

Package Outline Dimensions (DFN3x3)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.700	0.800	0.028	0.031
A1	0.150	0.250	0.006	0.010
A2	-	0.050	-	0.002
D	3.200	3.400	0.126	0.134
E	3.200	3.400	0.126	0.134
D1	2.650	2.850	0.104	0.112
E1	2.000	2.250	0.079	0.089
b	0.250	0.400	0.010	0.016
L	0.400	0.600	0.016	0.024
L1	0.350 BSC		0.014 BSC	
k	0.250	0.500	0.010	0.020
e	0.65BSC		0.026BSC	

Recommended Pad Layout

