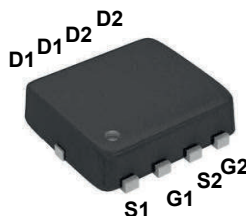
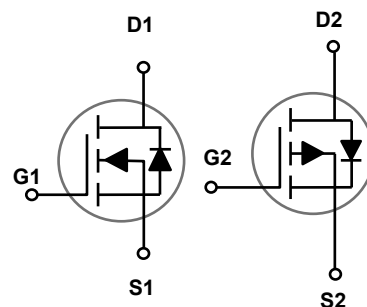


Main Product Characteristics

Polarity	N-Ch	P-Ch
V_{DSS}	30V	-30V
$R_{DS(ON)}$ (Max.)	20m Ω	18m Ω
I_D	12A	-16A



PPAK3x3 Dual Pin



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 GSFN3703 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	Rating		Unit
		N-Ch	P-Ch	
Drain-Source Voltage	V_{DS}	30	-30	V
Gate-Source Voltage	V_{GS}	± 20	± 20	V
Drain Current – Continuous ($T_C=25^\circ\text{C}$)	I_D	12	-16	A
Drain Current – Continuous ($T_C=100^\circ\text{C}$)		7.6	-10.1	A
Drain Current – Pulsed ¹	I_{DM}	48	-64	A
Single Pulse Avalanche Energy ^{2,6}	E_{AS}	32	63	mJ
Single Pulse Avalanched Current ²	I_{AS}	8	35	A
Power Dissipation ($T_C=25^\circ\text{C}$)	P_D	20		W
Power Dissipation – Derate above 25°C		0.16		W/ $^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 to +150		$^\circ\text{C}$
Operating Junction Temperature Range	T_J	-55 to +150		$^\circ\text{C}$

Thermal Characteristics

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	-	62.5	$^\circ\text{C/W}$
Thermal Resistance Junction to Case	$R_{\theta JC}$	-	6.4	$^\circ\text{C/W}$

N-Channel Electrical Characteristics (T_J=25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250uA	30	-	-	V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =30V, V _{GS} =0V, T _J =25°C	-	-	1	uA
		V _{DS} =24V, V _{GS} =0V, T _J =125°C	-	-	10	uA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
On Characteristics						
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =10V, I _D =8A	-	15	20	mΩ
		V _{GS} =4.5V, I _D =5A	-	21	30	mΩ
Gate Threshold Voltage	V _{GS(th)}	V _{GS} =V _{DS} , I _D =250uA	1.2	1.5	2.5	V
V _{GS(th)} Temperature Coefficient	ΔV _{GS(th)}		-	-4	-	mV/°C
Forward Transconductance	g _{fs}	V _{DS} =5V, I _D =6A	-	13	-	S
Dynamic and Switching Characteristics						
Total Gate Charge ^{3,4}	Q _g	V _{DS} =15V, V _{GS} =10V, I _D =6A	-	9.1	18	nC
Gate-Source Charge ^{3,4}	Q _{gs}		-	1	2	
Gate-Drain Charge ^{3,4}	Q _{gd}		-	2.1	4	
Turn-On Delay Time ^{3,4}	T _{d(on)}	V _{DD} =15V, V _{GS} =10V, R _G =6Ω, I _D =1A	-	2.8	5	nS
Rise Time ^{3,4}	T _r		-	7.2	14	
Turn-Off Delay Time ^{3,4}	T _{d(off)}		-	15.8	30	
Fall Time ^{3,4}	T _f		-	4.6	9	
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, F=1MHz	-	345	500	pF
Output Capacitance	C _{oss}		-	55	80	
Reverse Transfer Capacitance	C _{rss}		-	32	55	
Gate Resistance	R _g	V _{GS} =0V, V _{DS} =0V, F=1MHz	-	3.2	6.4	Ω
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I _S	V _G =V _D =0V, Force Current	-	-	12	A
Pulsed Source Current	I _{SM}		-	-	24	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=1mH, I_{AS}=8A, R_G=25Ω, Starting T_J=25°C.
3. The data tested by pulsed, pulse width ≤ 300uS, duty cycle ≤ 2%.
4. Essentially independent of operating temperature.

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =-250uA	-30	-	-	V
BV _{DSS} Temperature Coefficient	△BV _{DSS} / △T _J	Reference to 25°C, I _D =-1mA	-	-0.03	-	V/°C
Drain-Source Leakage Current	I _{DSS}	V _{DS} =-30V, V _{GS} =0V, T _J =25°C	-	-	-1	uA
		V _{DS} =-24V, V _{GS} =0V, T _J =125°C	-	-	-10	uA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
On Characteristics						
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =-10V, I _D =-8A	-	14.5	18	mΩ
		V _{GS} =-4.5V, I _D =-5A	-	23	30	mΩ
Gate Threshold Voltage	V _{GS(th)}	V _{GS} =V _{DS} , I _D =-250uA	-1.2	-1.6	-2.5	V
V _{GS(th)} Temperature Coefficient	△V _{GS(th)}		-	4	-	mV/°C
Forward Transconductance	g _{fs}	V _{DS} =-10V, I _D =-3A	-	6.8	-	S
Dynamic and Switching Characteristics						
Total Gate Charge ^{7, 8}	Q _g	V _{DS} =-15V, V _{GS} =-10V, I _D =-5A	-	24.4	48	nC
Gate-Source Charge ^{7, 8}	Q _{gs}		-	3.4	6	
Gate-Drain Charge ^{7, 8}	Q _{gd}		-	4.2	8	
Turn-On Delay Time ^{7, 8}	T _{d(on)}	V _{DD} =-15V, V _{GS} =-10V, R _G =6Ω, I _D =-1A	-	5.8	11	nS
Rise Time ^{7, 8}	T _r		-	18.8	36	
Turn-Off Delay Time ^{7, 8}	T _{d(off)}		-	46.9	90	
Fall Time ^{7, 8}	T _f		-	12.3	23	
Input Capacitance	C _{iss}	V _{DS} =-15V, V _{GS} =0V, F=1MHz	-	1250	2500	pF
Output Capacitance	C _{oss}		-	160	320	
Reverse Transfer Capacitance	C _{rss}		-	90	180	
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I _S	V _G =V _D =0V, Force Current	-	-	-16	A
Pulsed Source Current	I _{SM}		-	-	-32	A
Diode Forward Voltage	V _{SD}	V _{GS} =0V , I _S =1A , T _J =25°C	-	-	-1	V

Note:

5. Repetitive Rating: Pulsed width limited by maximum junction temperature.
6. $V_{DD}=-25V, V_{GS}=-10V, L=0.1mH, I_{AS}=-35A, R_G=25\Omega$, Starting $T_J=25^{\circ}\text{C}$
7. The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
8. Essentially independent of operating temperature.

N-Channel Typical Characteristic Curves

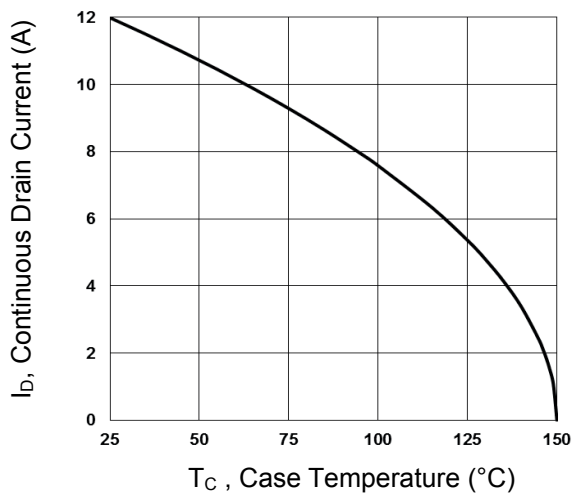


Figure 1. Continuous Drain Current vs. T_C

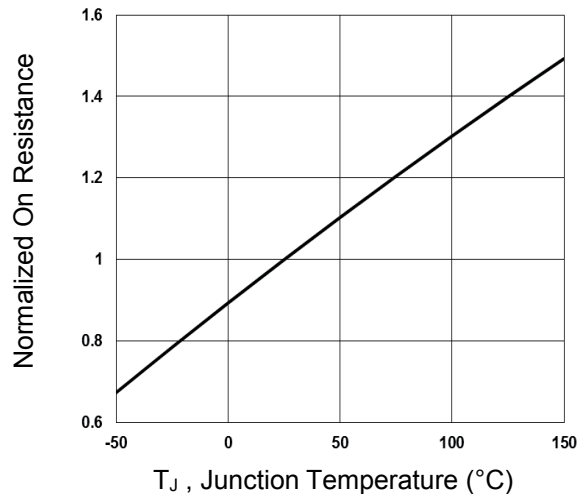


Figure 2. Normalized $R_{DS(on)}$ vs. T_J

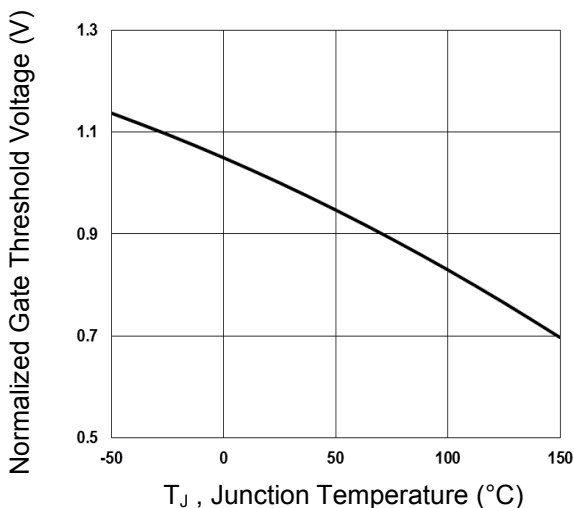


Figure 3. Normalized V_{th} vs. T_J

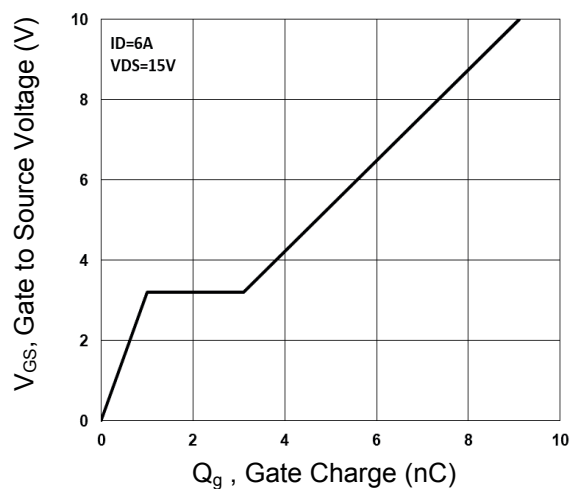


Figure 4. Gate Charge Waveform

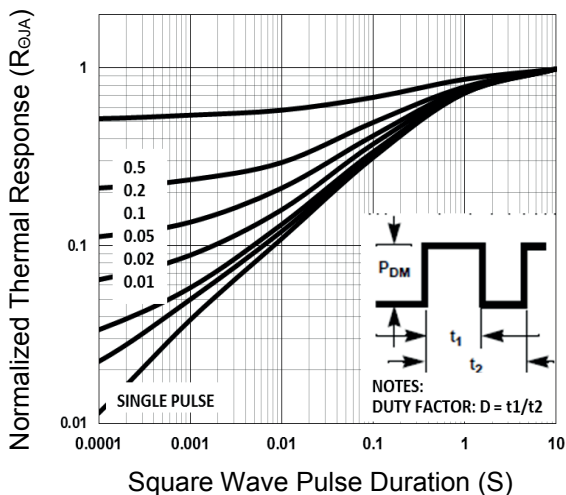


Figure 5. Normalized Transient Response

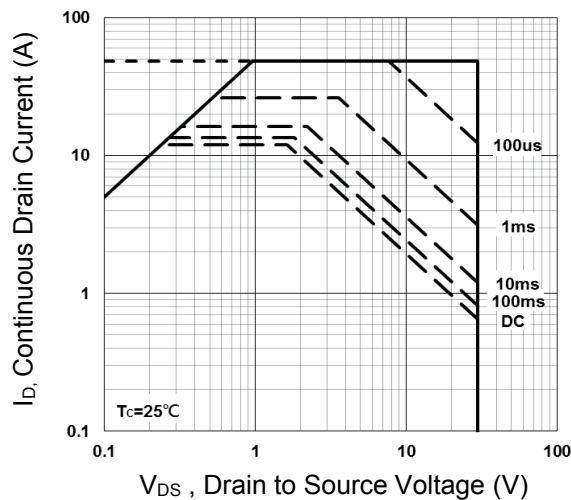


Figure 6. Maximum Safe Operation Area

P-Channel Typical Characteristic Curves

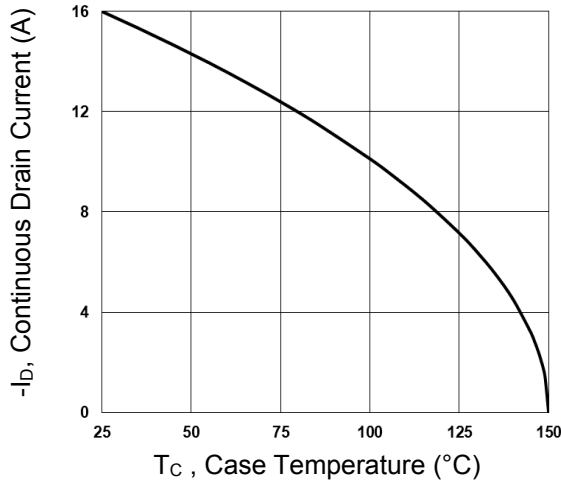


Figure 1. Continuous Drain Current vs. T_C

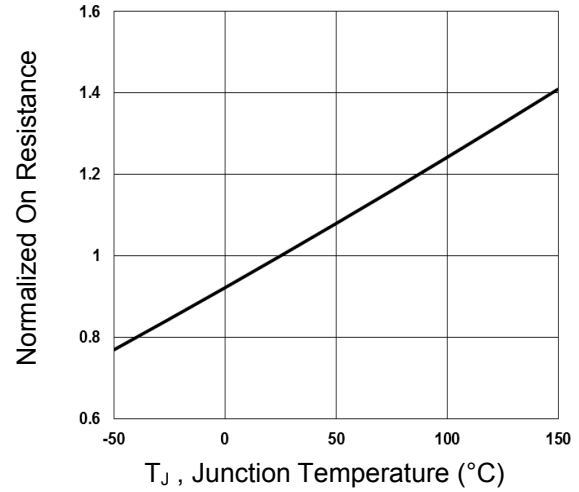


Figure 2. Normalized $R_{DS(ON)}$ vs. T_J

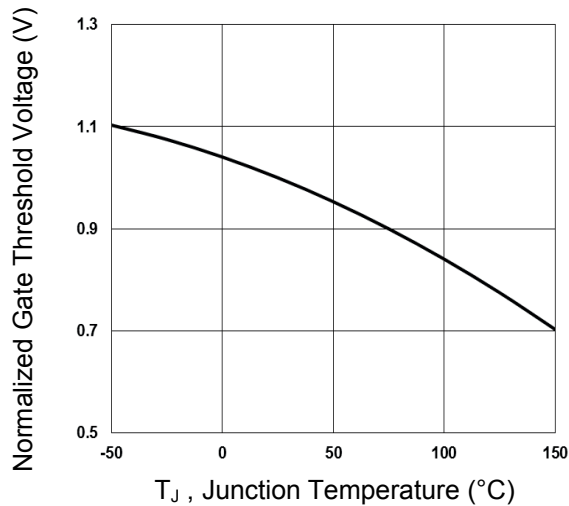


Figure 3. Normalized V_{th} vs. T_J

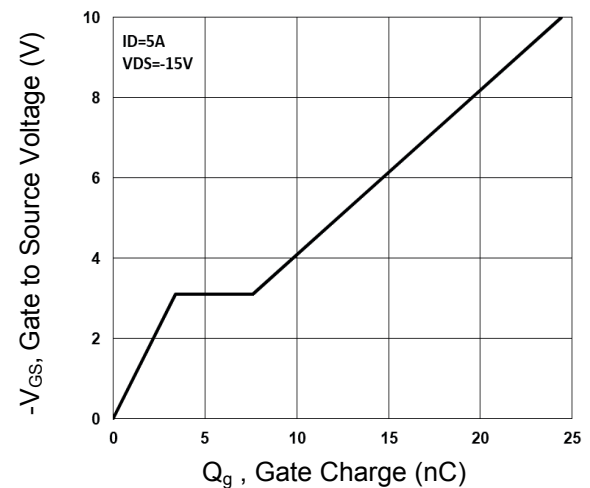


Figure 4. Gate Charge Waveform

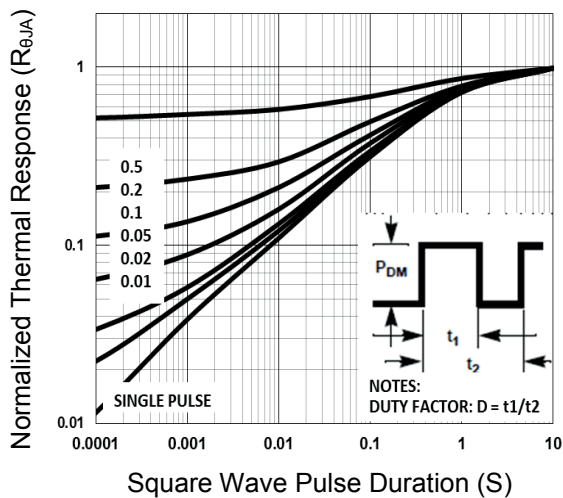


Figure 5. Normalized Transient Impedance

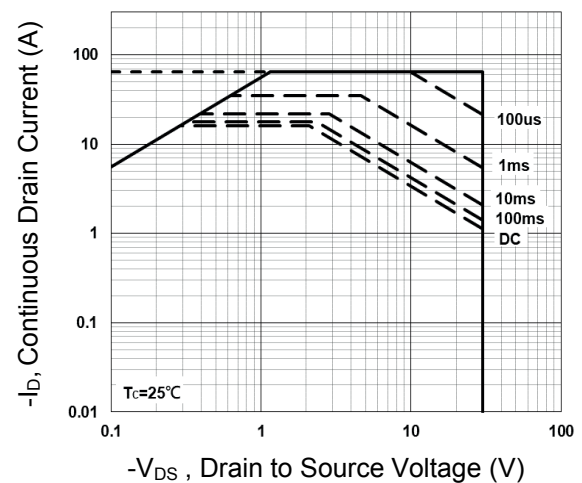
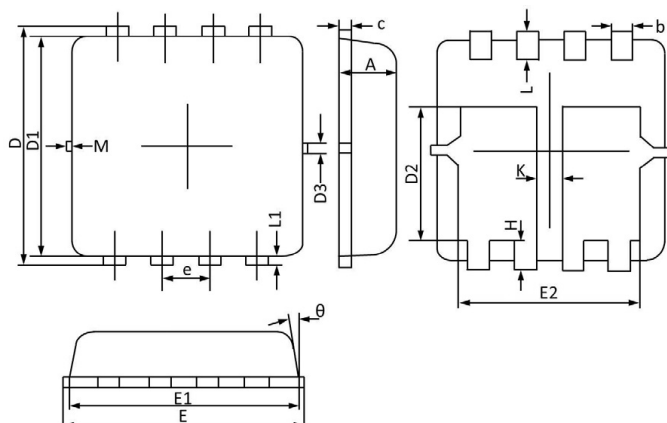


Figure 6. Maximum Safe Operation Area

Package Outline Dimensions (PPAK3x3 Dual)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.670	0.880	0.026	0.035
b	0.250	0.350	0.010	0.014
c	0.100	0.250	0.004	0.010
D	3.150	3.550	0.124	0.140
D1	3.000	3.300	0.118	0.130
D2	1.500	2.000	0.059	0.079
D3	0.130	0.200	0.005	0.008
E	3.100	3.500	0.122	0.138
E1	3.000	3.200	0.118	0.126
E2	2.350	2.600	0.093	0.102
e	0.650 BSC		0.026 BSC	
H	0.300	0.500	0.012	0.020
L	0.300	0.500	0.012	0.020
L1	0.130 REF		0.005 REF	
K	0.300 REF		0.012 REF	
θ	0°	12°	0°	12°
M	0.150 REF		0.006 REF	

Recommended Pad Layout

