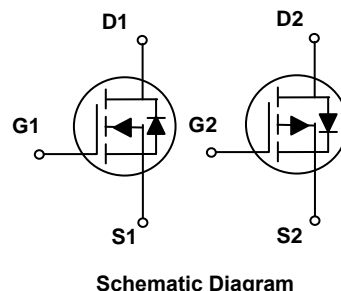


Main Product Characteristics

BV_{DSS}	30V	-30V
$R_{DS(ON)}$	13mΩ	32mΩ
I_D	10A	-7A



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 GSFN03C10 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}	30	-30	V
Gate-Source Voltage	V_{GS}	±20	±20	V
Drain Current-Continuous ($T_C=25^{\circ}C$)	I_D	10	-7	A
Drain Current-Continuous ($T_C=100^{\circ}C$)		6.3	-4.4	
Drain Current-Pulsed ¹	I_{DM}	40	28	A
Power Dissipation ($T_C=25^{\circ}C$)	P_D	2.5		W
Power Dissipation-Derate above 25°C		0.02		W/°C
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	50		°C/W
Operating Junction Temperature Range	T_J	-55 To +150		°C
Storage Temperature Range	T_{STG}	-55 To +150		°C

N-Channel 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	
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 =10A	-	10	13	mΩ
		V _{GS} =4.5V, I _D =8A	-	14	18	
Gate Threshold Voltage	V _{GS(th)}	V _{GS} =V _{DS} , I _D =250μA	1.2	1.5	2.5	V
V _{GS(th)} Temperature Coefficient	ΔV _{GS(th)}		-	-4	-	mV/°C
Forward Transconductance	g _{fs}	V _{DS} =10V, I _D =3A	-	6	-	S
Dynamic and Switching Characteristics						
Total Gate Charge ^{2,3}	Q _g	V _{DS} =24V, I _D =5A, V _{GS} =10V	-	12.9	19	nC
Gate-Source Charge ^{2,3}	Q _{gs}		-	1.2	2	
Gate-Drain Charge ^{2,3}	Q _{gd}		-	4.1	6	
Turn-On Delay Time ^{2,3}	t _{d(on)}	V _{DD} =15V, R _G =6Ω, V _{GS} =10V, I _D =1A	-	3.8	7	nS
Rise Time ^{2,3}	t _r		-	10	19	
Turn-Off Delay Time ^{2,3}	t _{d(off)}		-	22	42	
Fall Time ^{2,3}	t _f		-	6.6	13	
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, F=1MHz	-	620	900	pF
Output Capacitance	C _{oss}		-	85	125	
Reverse Transfer Capacitance	C _{rss}		-	60	90	
Gate Resistance	R _g	V _{GS} =0V, V _{DS} =0V, F=1MHz	-	2.8	5.6	Ω
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I _S	V _G =V _D =0V, Force Current	-	-	10	A
Pulsed Source Current	I _{SM}		-	-	20	A
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =1A, T _J =25°C	-	-	1	V
Reverse Recovery Time	t _{rr}	V _{GS} =0V, I _S =10A, di/dt=100A/μs, T _J =25°C	-	70	-	nS
Reverse Recovery Charge	Q _{rr}		-	150	-	nC

Note:

1. Repetitive rating: Pulsed width limited by maximum junction temperature.
2. The datasheet test by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%.
3. Essentially independent of operation temperature.

N-Channel Typical Electrical and Thermal Characteristic Curves

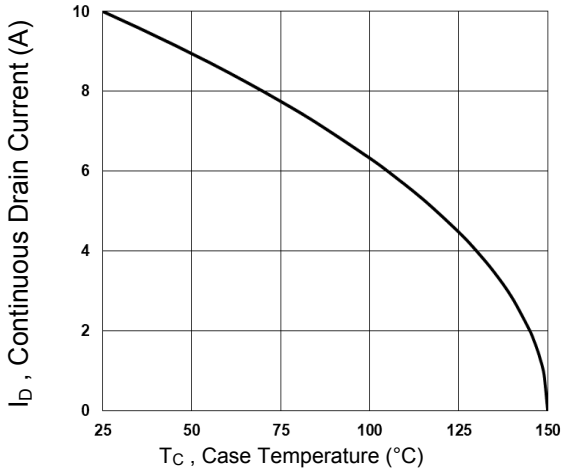


Fig.1 Continuous Drain Current vs. Tc

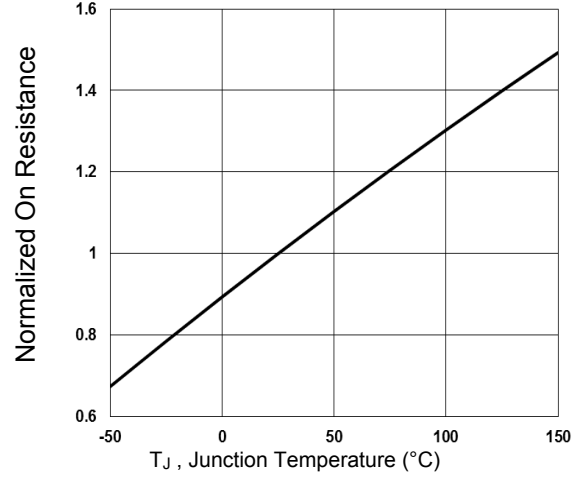


Fig.2 Normalized $R_{DS(ON)}$ vs. T_J

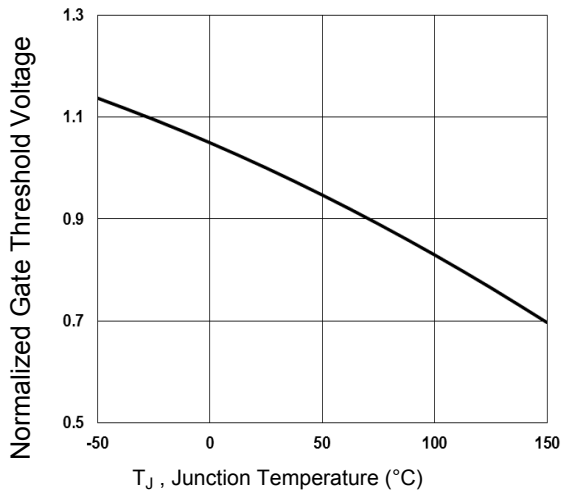


Fig.3 Normalized V_{th} vs. T_J

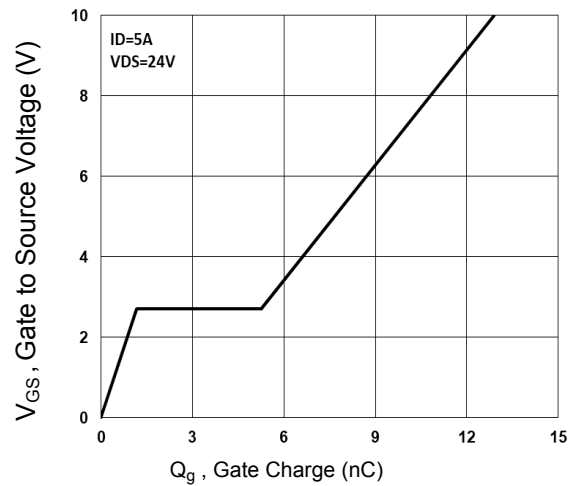


Fig.4 Gate Charge Waveform

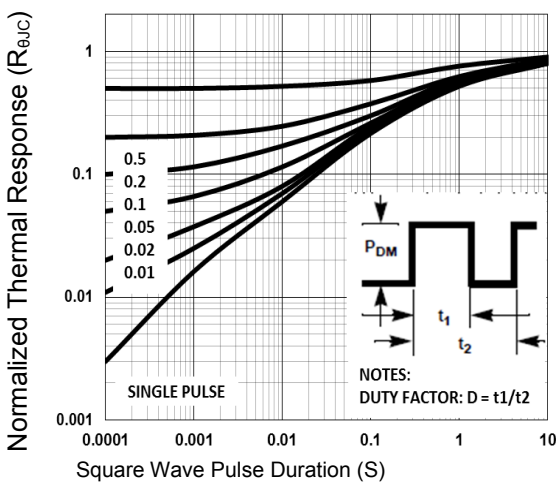


Fig.5 Normalized Transient Impedance

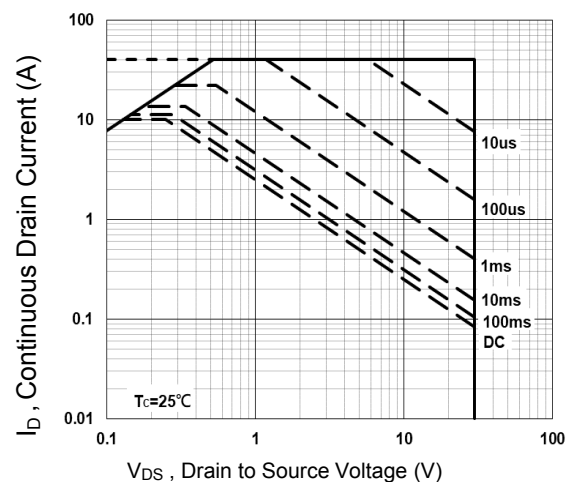


Fig.6 Maximum Safe Operation Area

P-Channel 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	
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 =-7A	-	26	32	mΩ
		V _{GS} =-4.5V, I _D =-5A	-	38	49	
Gate Threshold Voltage	V _{GS(th)}	V _{GS} =V _{DS} , I _D =-250μA	-1.2	-1.5	-2.5	V
Forward Transconductance	g _{fs}	V _{DS} =-10V, I _D =-3A	-	-5	-	S
Dynamic and Switching Characteristics						
Total Gate Charge ^{4,5}	Q _g	V _{DS} =-24V, I _D =-5A, V _{GS} =-10V	-	13.6	20	nC
Gate-Source Charge ^{4,5}	Q _{gs}		-	1.6	2.4	
Gate-Drain Charge ^{4,5}	Q _{gd}		-	3.8	6.0	
Turn-On Delay Time ^{4,5}	t _{d(on)}	V _{DD} =-15V, R _G =6Ω, V _{GS} =-10V, I _D =-1A	-	4.6	9	nS
Rise Time ^{4,5}	t _r		-	14	26	
Turn-Off Delay Time ^{4,5}	t _{d(off)}		-	34	58	
Fall Time ^{4,5}	t _f		-	18	35	
Input Capacitance	C _{iss}	V _{DS} =-15V, V _{GS} =0V, F=1MHz	-	757	1280	pF
Output Capacitance	C _{oss}		-	122	210	
Reverse Transfer Capacitance	C _{rss}		-	88	175	
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I _s	V _G =V _D =0V, Force Current	-	-	-7	A
Pulsed Source Current	I _{SM}		-	-	-14	A
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =-1A, T _J =25°C	-	-	-1	V
Reverse Recovery Time	t _{rr}	V _{GS} =0V, I _S =-7A, di/dt=100A/μs, T _J =25°C	-	80	-	nS
Reverse Recovery Charge	Q _{rr}		-	230	-	nC

Note:

4. The datasheet test by pulsed, pulse width≤300us,duty cycle ≤2%.
5. Essentially independent of operation temperature.

P-Channel Typical Electrical and Thermal Characteristic Curves

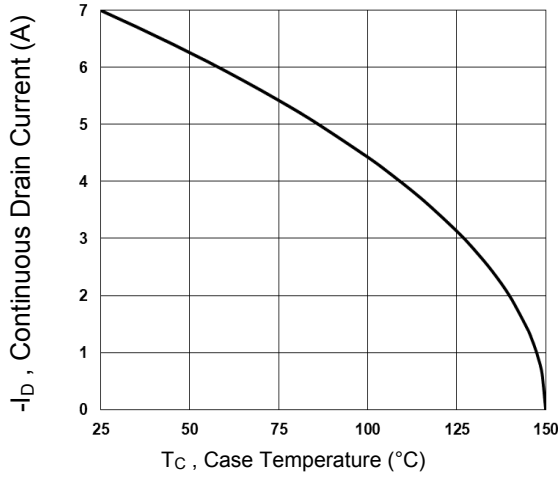


Fig.1 Continuous Drain Current vs. Tc

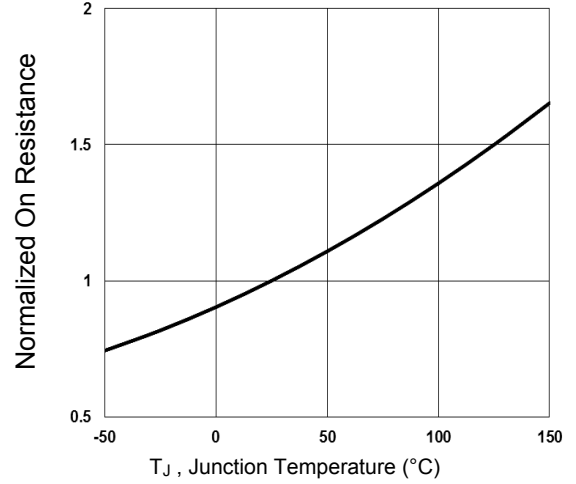


Fig.2 Normalized $R_{DS(ON)}$ vs. T_J

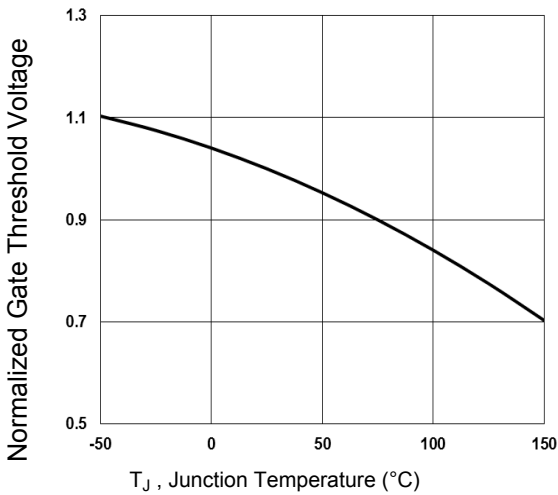


Fig.3 Normalized V_{th} vs. T_J

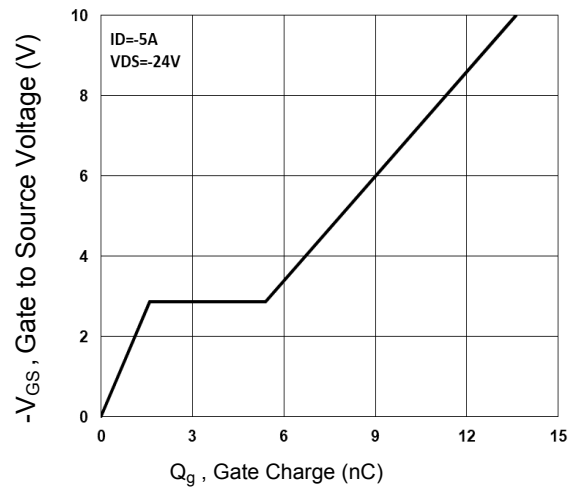


Fig.4 Gate Charge Waveform

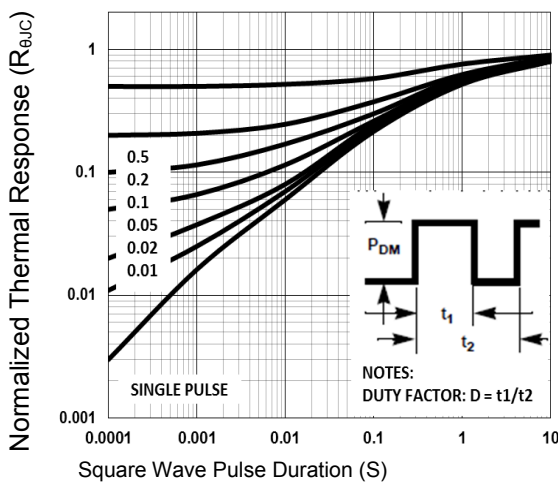


Fig.5 Normalized Transient Impedance

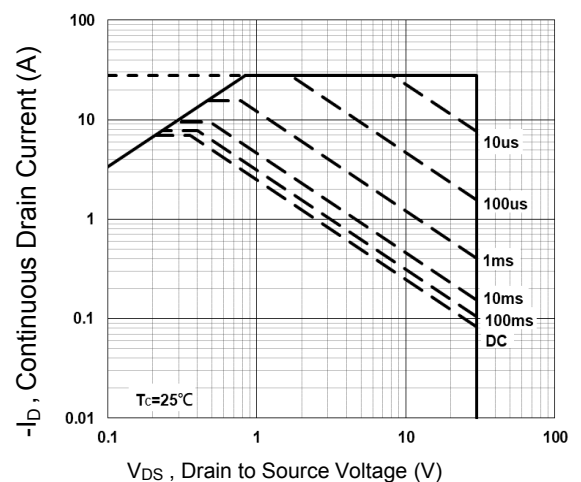


Fig.6 Maximum Safe Operation Area

Package Outline Dimensions

PPAK3X3 Dual NEP

