

GI03N70**N-CHANNEL ENHANCEMENT MODE POWER MOSFET**

BV _{DSS}	600V
R _{DS(ON)}	4.0Ω
I _D	3.3A

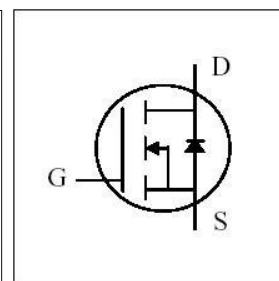
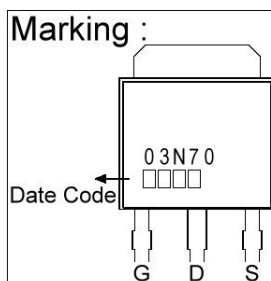
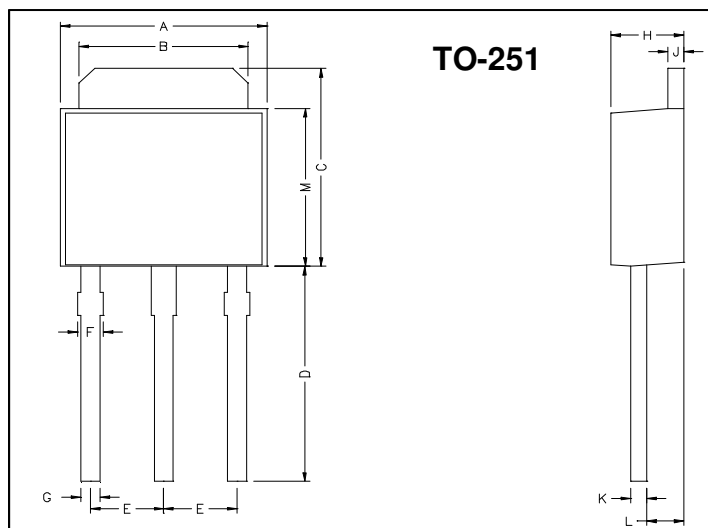
Description

The GI03N70 is specially designed as main switching devices for universal 90~265VAC off-line AC/DC converter applications.

The TO-251 package is available for low-profile applications and suited for AC/DC converters.

Features

- *Dynamic dv/dt Rating
- *Simple Drive Requirement
- *Repetitive Avalanche Rated
- *Fast Switching Speed

Package Dimensions

REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	6.40	6.80	G	0.50	0.70
B	5.20	5.50	H	2.20	2.40
C	6.80	7.20	J	0.45	0.55
D	7.20	7.80	K	0.45	0.60
E	2.30 REF.		L	0.90	1.50
F	0.60	0.90	M	5.40	5.80

Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V _{DS}	600	V
Gate-Source Voltage	V _{GS}	±30	V
Continuous Drain Current, V _{GS} @10V	I _D @T _C =25°C	3.3	A
Continuous Drain Current, V _{GS} @10V	I _D @T _C =100°C	2.1	A
Pulsed Drain Current ¹	I _{DM}	13.2	A
Total Power Dissipation	P _D @T _C =25°C	45	W
Linear Derating Factor		0.36	W/°C
Single Pulse Avalanche Energy ²	E _{AS}	85	mJ
Avalanche Current	I _{AR}	3.3	A
Repetitive Avalanche Energy	E _{AR}	3.3	mJ
Operating Junction and Storage Temperature Range	T _j , T _{stg}	-55 ~ +150	°C

Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance Junction-case Max.	R _{thj-c}	2.8	°C/W
Thermal Resistance Junction-ambient Max.	R _{thj-a}	110	°C/W

Electrical Characteristics (T_j = 25°C unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	BV _{DSS}	600	-	-	V	V _{GS} =0, I _D =250uA
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS} / \Delta T_j$	-	0.6	-	V/°C	Reference to 25°C, I _D =1mA
Gate Threshold Voltage	V _{GS(th)}	2.0	-	4.0	V	V _{DS} =V _{GS} , I _D =250uA
Forward Transconductance	g _{fs}	-	2.0	-	S	V _{DS} =10V, I _D =1.6A
Gate-Source Leakage Current	I _{GSS}	-	-	±1	uA	V _{GS} = ±30V
Drain-Source Leakage Current(T _j =25°C)	I _{DSS}	-	-	100	uA	V _{DS} =600V, V _{GS} =0
Drain-Source Leakage Current(T _j =150°C)		-	-	500	uA	V _{DS} =480V, V _{GS} =0
Static Drain-Source On-Resistance	R _{DS(ON)}	-	-	4.0	Ω	V _{GS} =10V, I _D =1.6A
Total Gate Charge ³	Q _g	-	11.4	-	nC	I _D =3.3A V _{DS} =480V V _{GS} =10V
Gate-Source Charge	Q _{gs}	-	3.1	-		
Gate-Drain ("Miller") Change	Q _{gd}	-	4.2	-		
Turn-on Delay Time ³	T _{d(on)}	-	8.4	-	ns	V _{DD} =300V I _D =3.3A V _{GS} =10V R _G =10Ω R _D =91Ω
Rise Time	T _r	-	6	-		
Turn-off Delay Time	T _{d(off)}	-	17.7	-		
Fall Time	T _f	-	5.9	-		
Input Capacitance	C _{iss}	-	600	-	pF	V _{GS} =0V V _{DS} =25V f=1.0MHz
Output Capacitance	C _{oss}	-	45	-		
Reverse Transfer Capacitance	C _{rss}	-	4	-		

Source-Drain Diode

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Forward On Voltage ³	V _{SD}	-	-	1.5	V	I _S =3.3A, V _{GS} =0V, T _j =25°C
Continuous Source Current (Body Diode)	I _S	-	-	3.3	A	V _D =V _G =0V, V _S =1.5V
Pulsed Source Current (Body Diode) ¹	I _{SM}	-	-	13.2	A	

Notes: 1. Pulse width limited by safe operating area.

2. Staring T_j=25°C, V_{DD}=50V, L=15mH, R_G=25Ω, I_{AS}=3.3A.

3. Pulse width ≤ 300us, duty cycle ≤ 2%.

Characteristics Curve

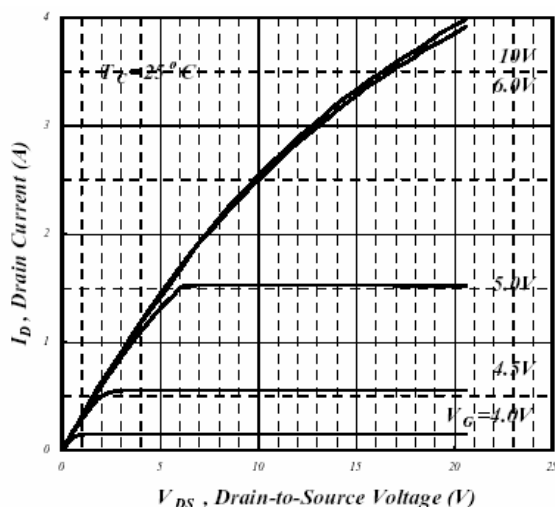


Fig 1. Typical Output Characteristics

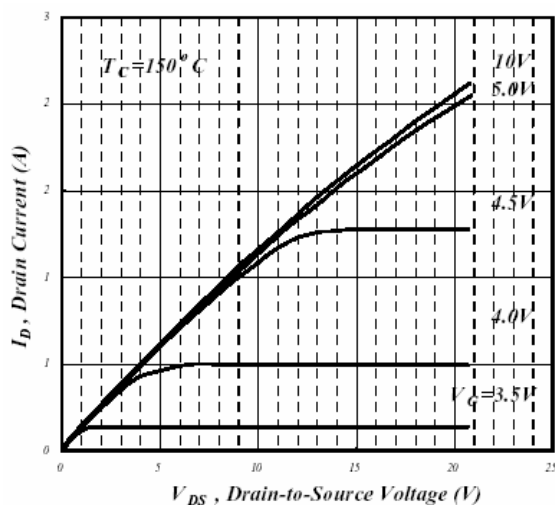


Fig 2. Typical Output Characteristics

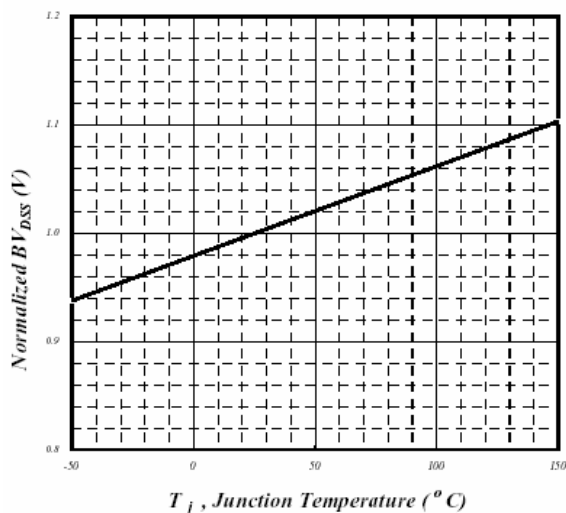


Fig 3. Normalized BV_DS vs. Junction Temperature

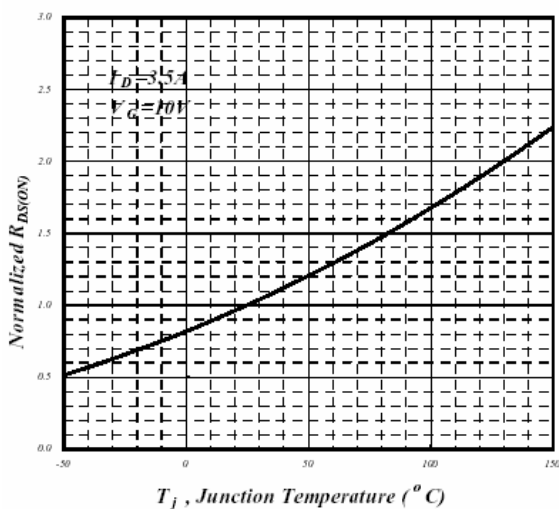


Fig 4. Normalized On-Resistance vs. Junction Temperature

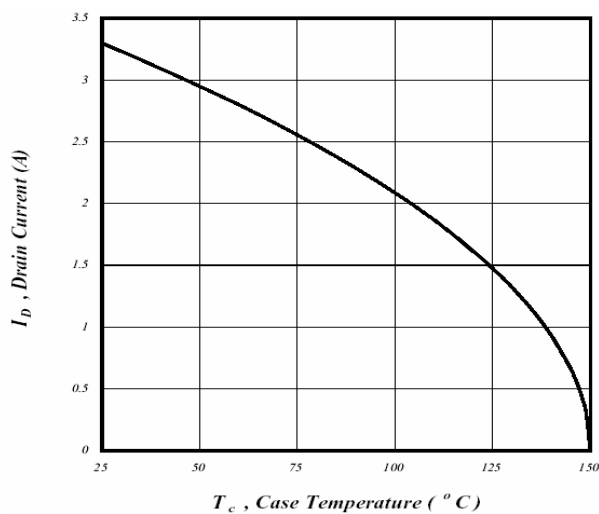


Fig 5. Maximum Drain Current vs. Case Temperature

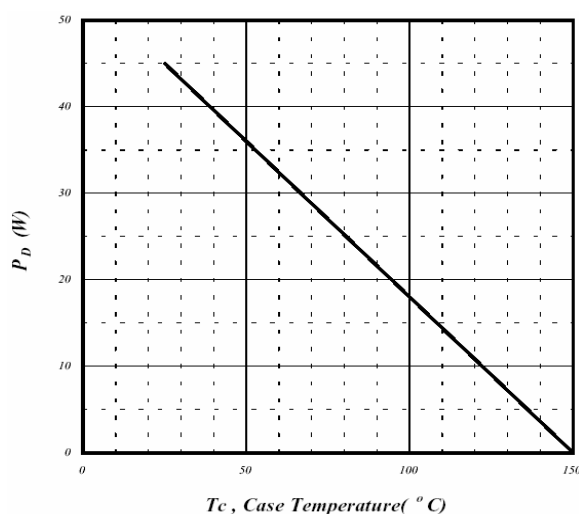


Fig 6. Type Power Dissipation

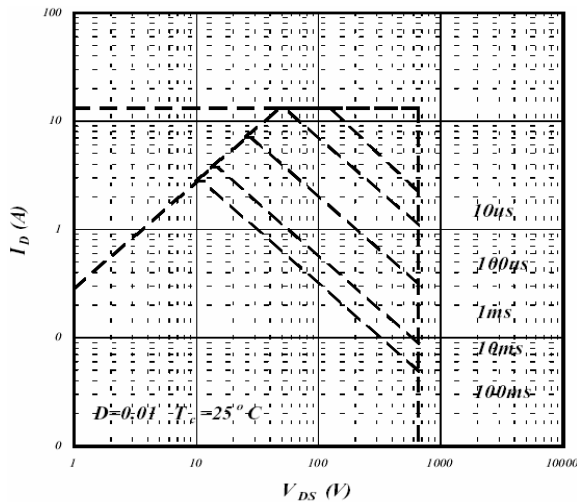


Fig 7. Maximum Safe Operating Area

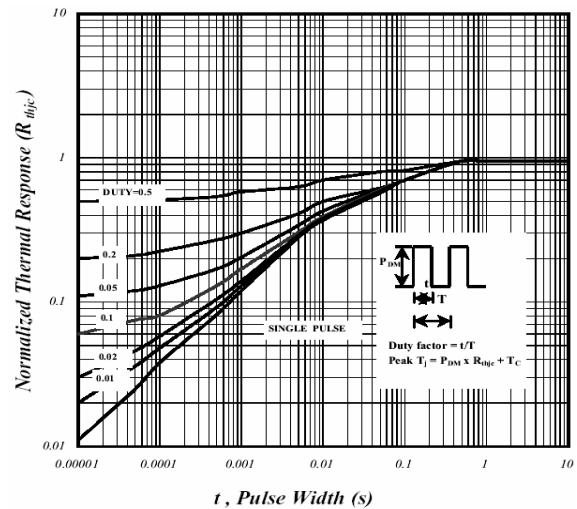


Fig 8. Effective Transient Thermal Impedance

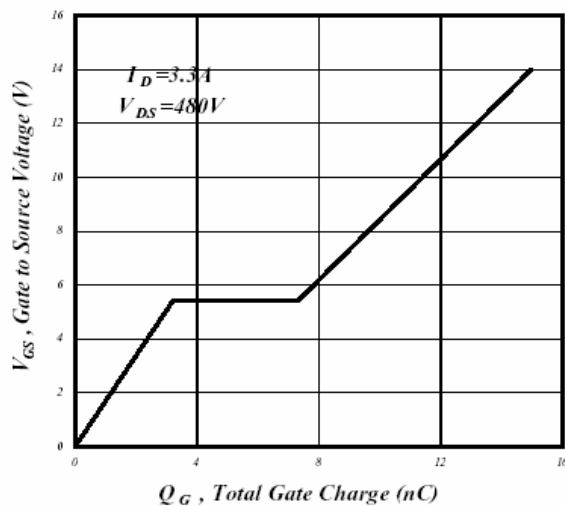


Fig 9. Gate Charge Characteristics

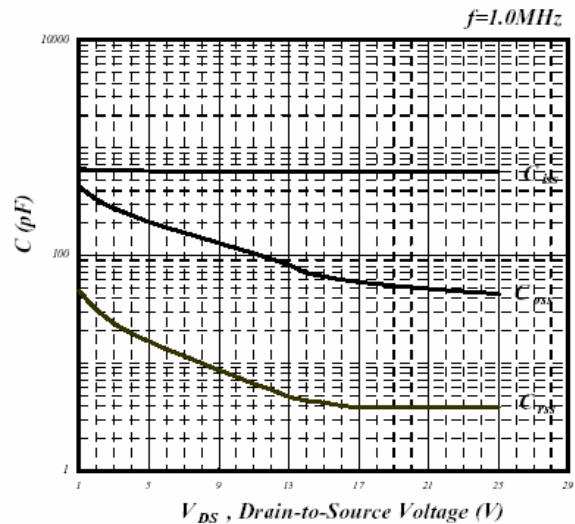


Fig 10. Typical Capacitance Characteristics

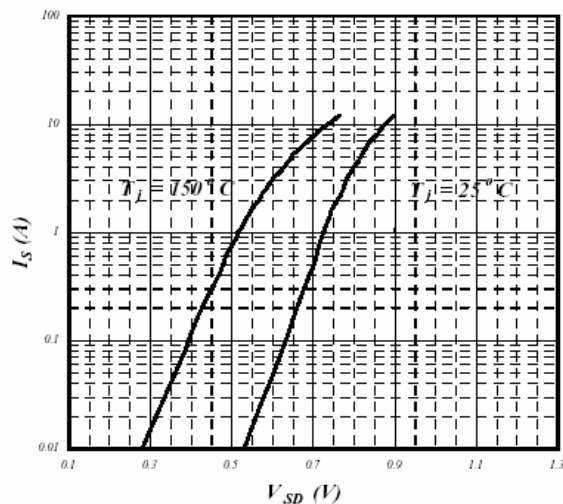


Fig 11. Forward Characteristics of Reverse Diode

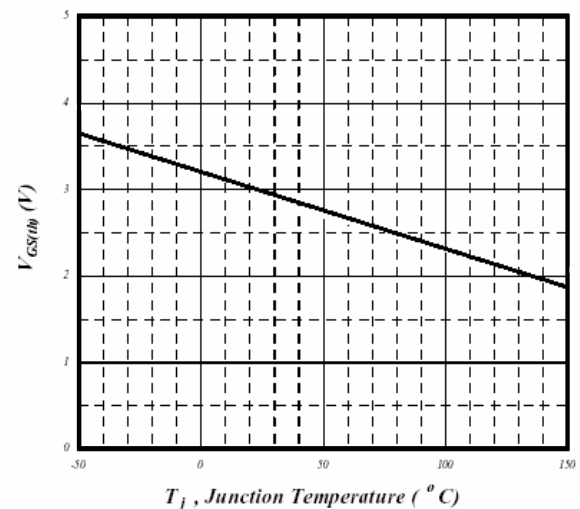


Fig 12. Gate Threshold Voltage v.s. Junction Temperature

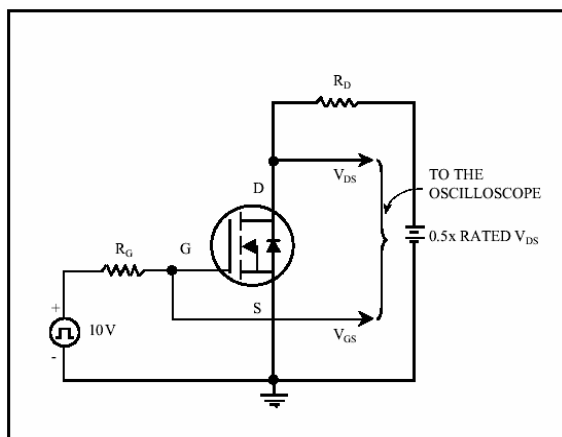


Fig 13. Switching Time Circuit

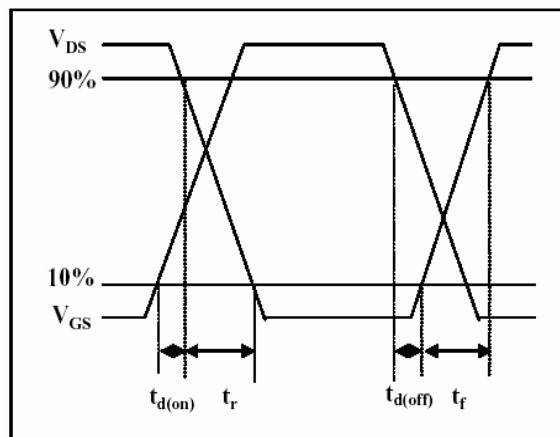


Fig 14. Switching Time Waveform

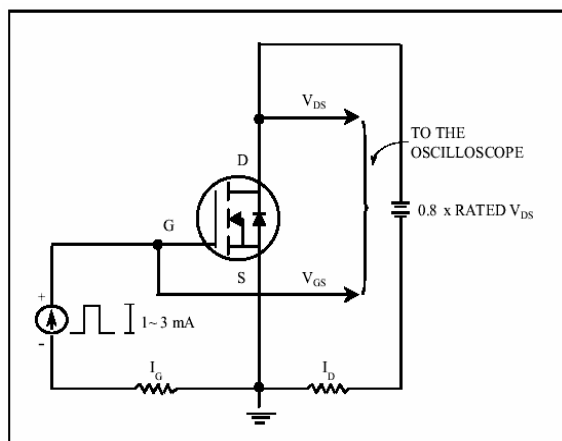


Fig 15. Gate Charge Circuit

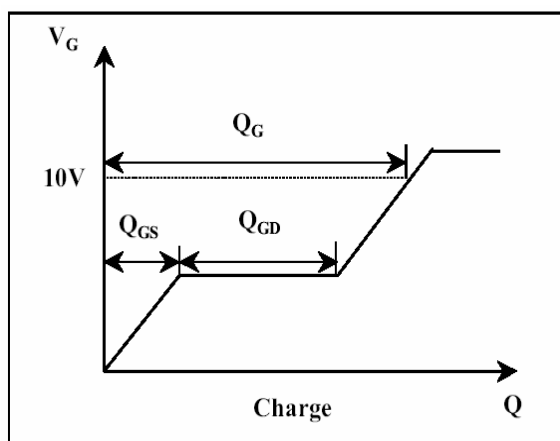


Fig 16. Gate Charge Waveform

Important Notice:

- All rights are reserved. Reproduction in whole or in part is prohibited without the prior written approval of GTM.
- GTM reserves the right to make changes to its products without notice.
- GTM semiconductor products are not warranted to be suitable for use in life-support Applications, or systems.
- GTM assumes no liability for any consequence of customer product design, infringement of patents, or application assistance.

Head Office And Factory:

- **Taiwan:** No. 17-1 Tatung Rd. Fu Kou Hsin-Chu Industrial Park, Hsin-Chu, Taiwan, R. O. C.
TEL : 886-3-597-7061 FAX : 886-3-597-9220, 597-0785
- **China:** (201203) No.255, Jang-Jiang Tsai-Lueng RD. , Pu-Dung-Hsin District, Shang-Hai City, China
TEL : 86-21-5895-7671 ~ 4 FAX : 86-21-38950165