

GU50L02

N-CHANNEL ENHANCEMENT MODE POWER MOSFET

BV _{DSS}	25V
R _{DS(ON)}	17mΩ
I _D	40A

Description

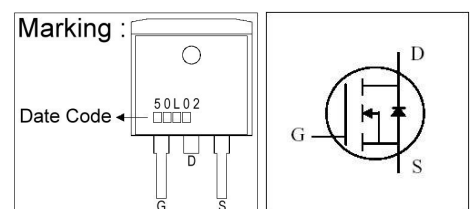
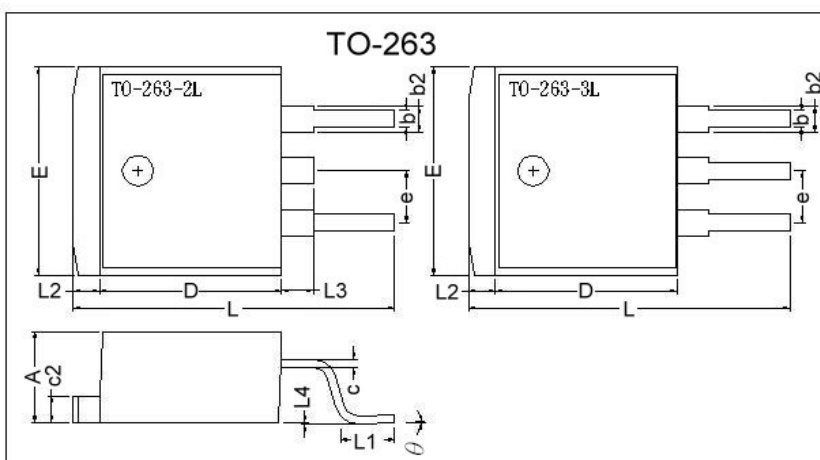
The GU50L02 provide the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness.

The TO-263 package is universally preferred for all commercial-industrial surface mount applications and suited for low voltage applications such as DC/DC converters.

Features

- *Low Gate Charge
- *Simple Drive Requirement
- *Fast Switching Characteristic

Package Dimensions



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	4.40	4.80	c2	1.25	1.45
b	0.76	1.00	b2	1.17	1.47
L4	0.00	0.30	D	8.6	9.0
c	0.36	0.5	e	2.54 REF.	
L3	1.50 REF.		L	14.6	15.8
L1	2.29	2.79	θ	0°	8°
E	9.80	10.4	L2	1.27 REF.	

Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DS}	25	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current, $V_{GS}@10V$	$I_D @T_C=25^{\circ}C$	40	A
Continuous Drain Current, $V_{GS}@10V$	$I_D @T_C=100^{\circ}C$	27	A
Pulsed Drain Current ¹	I_{DM}	140	A
Total Power Dissipation	$P_D @T_C=25^{\circ}C$	44.6	W
Linear Derating Factor		0.36	W/ $^{\circ}C$
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 ~ +150	$^{\circ}C$

Thermal Data

Parameter		Symbol	Value	Unit
Thermal Resistance Junction-case	Max.	Rthj-c	2.8	°C/W
Thermal Resistance Junction-ambient	Max.	Rthj-a	62	°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}	25	-	-	V	V _{GS} =0, I _D =250uA
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS} / \Delta T_j$	-	0.037	-	V/°C	Reference to 25°C, I _D =1mA
Gate Threshold Voltage	V _{GS(th)}	1.0	-	3.0	V	V _{DS} =V _{GS} , I _D =250uA
Forward Transconductance	g _{fs}	-	10	-	S	V _{DS} =10V, I _D =20A
Gate-Source Leakage Current	I _{GSS}	-	-	±100	nA	V _{GS} = ±20V
Drain-Source Leakage Current(T _j =25°C)	I _{DSS}	-	-	1	uA	V _{DS} =25V, V _{GS} =0
Drain-Source Leakage Current(T _j =150°C)		-	-	25	uA	V _{DS} =20V, V _{GS} =0
Static Drain-Source On-Resistance	R _{DS(ON)}	-	-	17	mΩ	V _{GS} =10V, I _D =20A
		-	-	35		V _{GS} =4.5V, I _D =10A
Total Gate Charge ²	Q _g	-	11.5	-	nC	I _D =20A V _{DS} =20V V _{GS} =5V
Gate-Source Charge	Q _{gs}	-	2.1	-		
Gate-Drain ("Miller") Charge	Q _{gd}	-	8.4	-		
Turn-on Delay Time ²	T _{d(on)}	-	7	-	ns	V _{DS} =15V I _D =20A V _{GS} =10V R _G =3.3Ω R _D =0.75Ω
Rise Time	T _r	-	60	-		
Turn-off Delay Time	T _{d(off)}	-	17	-		
Fall Time	T _f	-	9	-		
Input Capacitance	C _{iss}	-	390	-	pF	V _{GS} =0V V _{DS} =25V f=1.0MHz
Output Capacitance	C _{oss}	-	245	-		
Reverse Transfer Capacitance	C _{rss}	-	100	-		

Source-Drain Diode

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Forward On Voltage ²	V _{SD}	-	-	1.26	V	I _S =40A, V _{GS} =0V, T _j =25°C
Continuous Source Current (Body Diode)	I _S	-	-	40	A	V _D =V _G =0V, V _S =1.26V
Pulse Source Current (Body Diode) ¹	I _{SM}	-	-	140	A	

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

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

Characteristics Curve

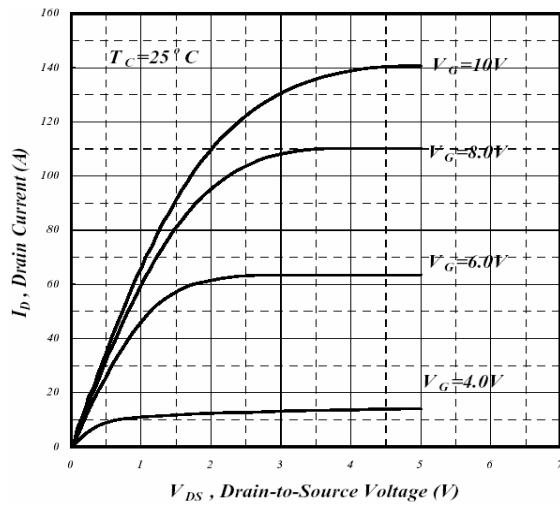


Fig 1. Typical Output Characteristics

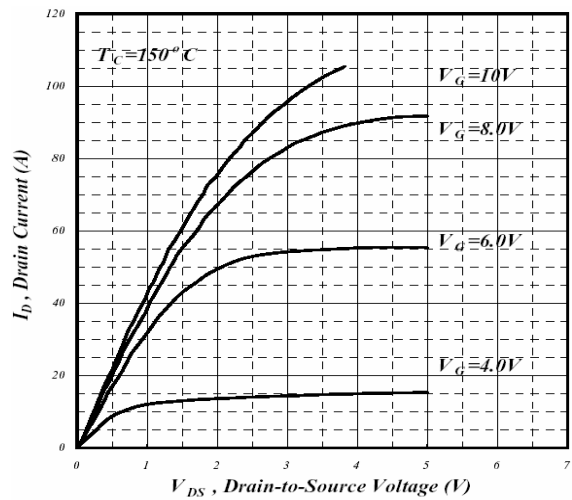


Fig 2. Typical Output Characteristics

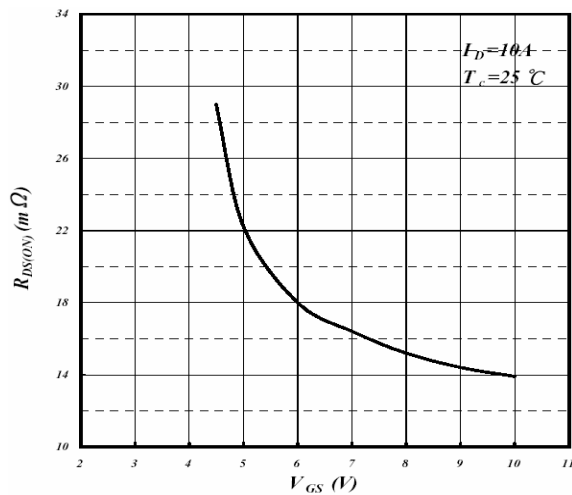


Fig 3. On-Resistance v.s. Gate Voltage

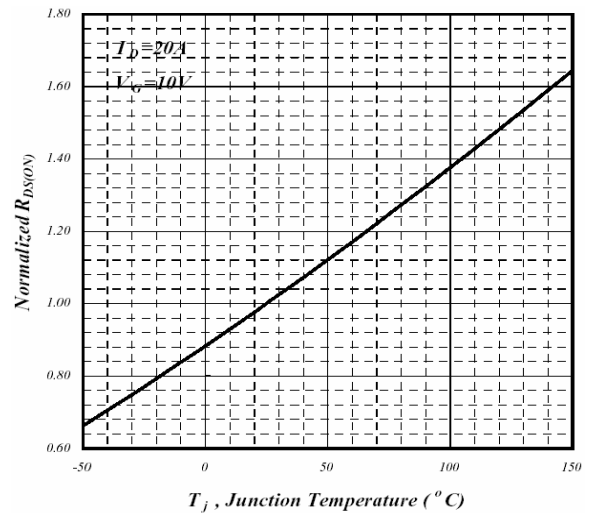


Fig 4. Normalized On-Resistance v.s. Junction Temperature

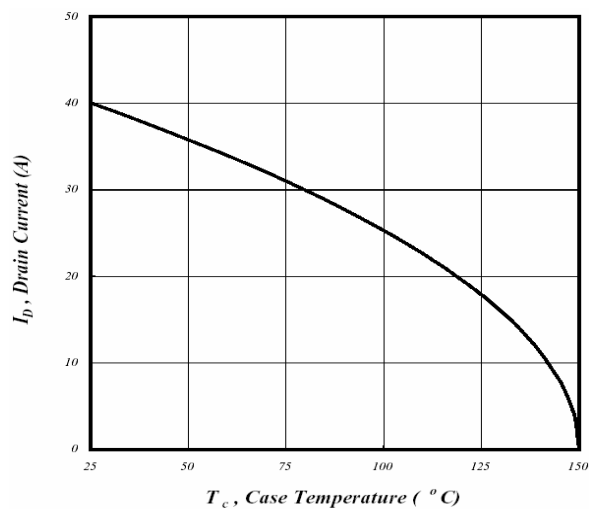


Fig 5. Maximum Drain Current v.s. Case Temperature

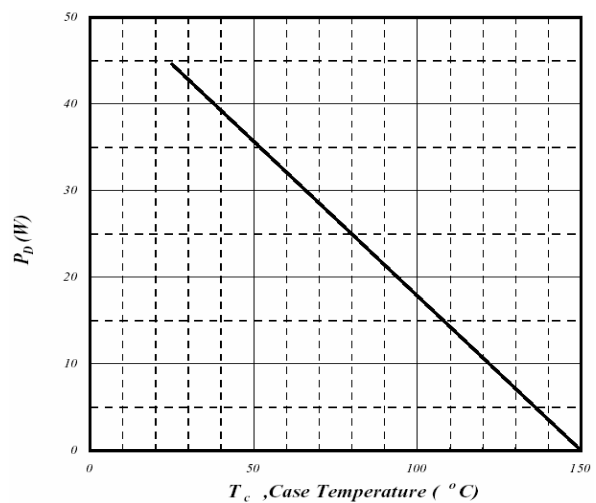


Fig 6. Type Power Dissipation

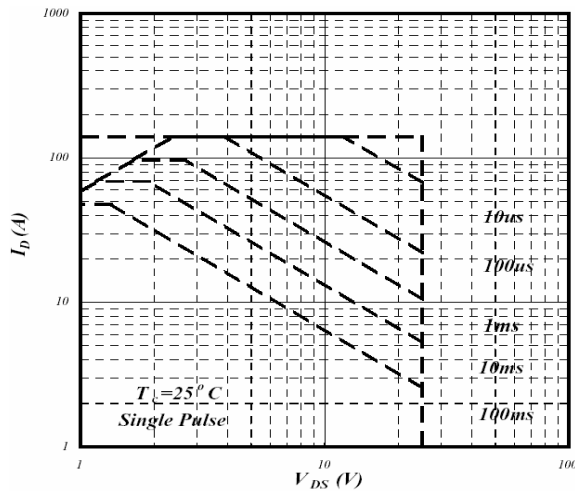


Fig 7. Maximum Safe Operating Area

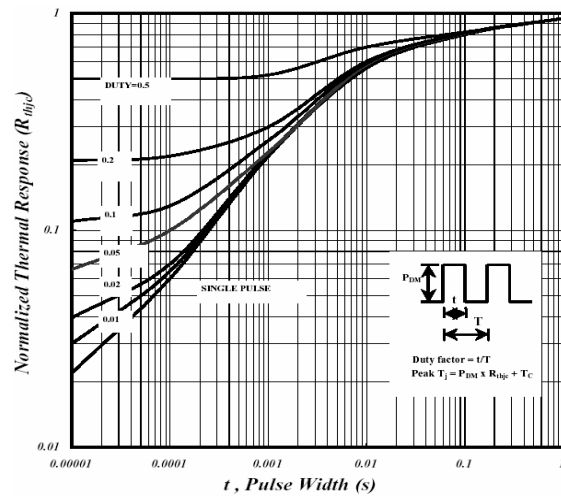


Fig 8. Effective Transient Thermal Impedance

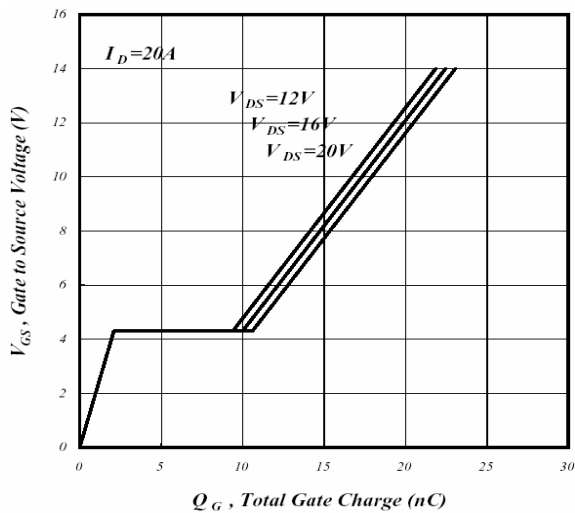


Fig 9. Gate Charge Characteristics

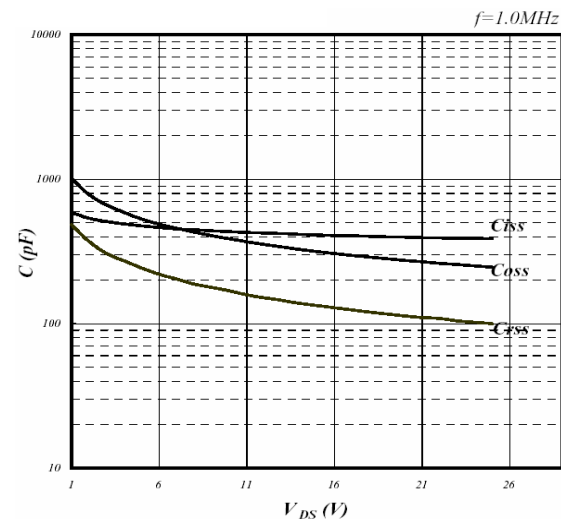


Fig 10. Typical Capacitance Characteristics

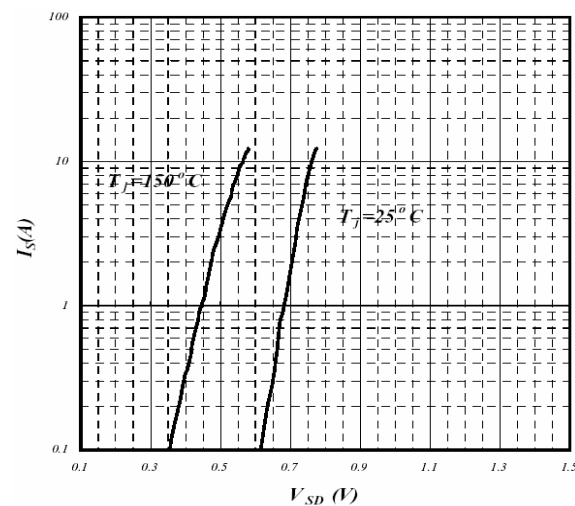


Fig 11. Forward Characteristics of Reverse Diode

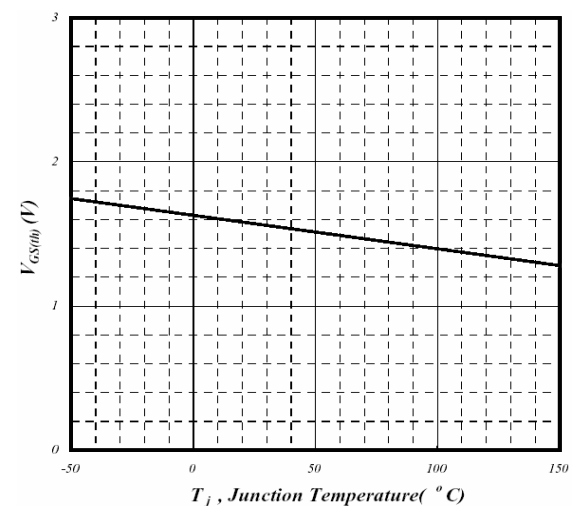


Fig 12. Gate Threshold Voltage v.s. Junction Temperature

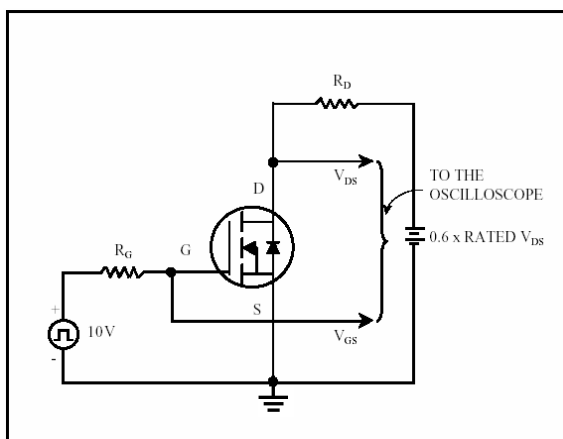


Fig 13. Switching Time Circuit

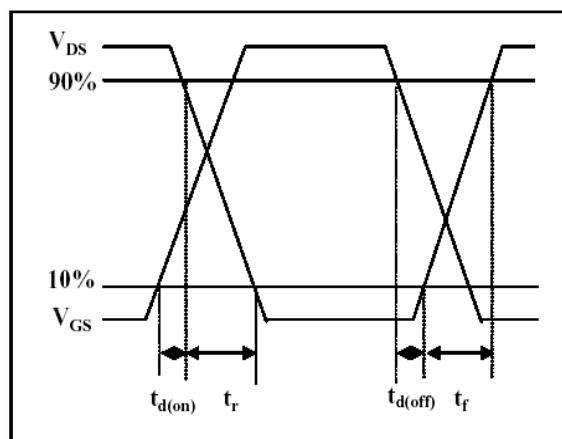


Fig 14. Switching Time Waveform

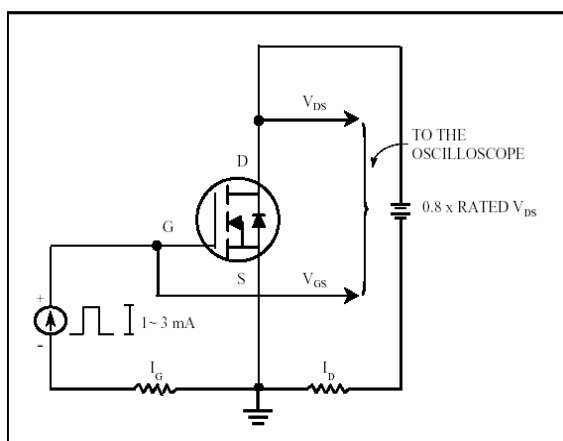


Fig 15. Gate Charge Circuit

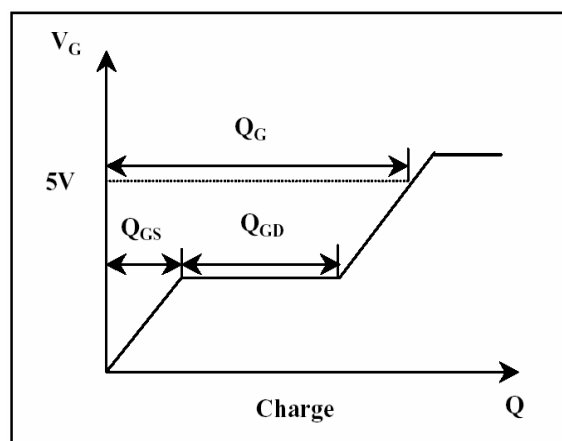


Fig 16. Gate Charge Waveform

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