

# GM2501

## P-CHANNEL ENHANCEMENT MODE POWER MOSFET

BVDSS	-20V
RDS(ON)	200mΩ
ID	-2.6A

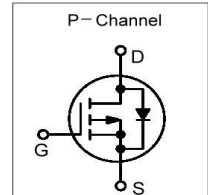
### Description

The GM2501 provide the designer with the best combination of fast switching, low on-resistance and cost-effectiveness.

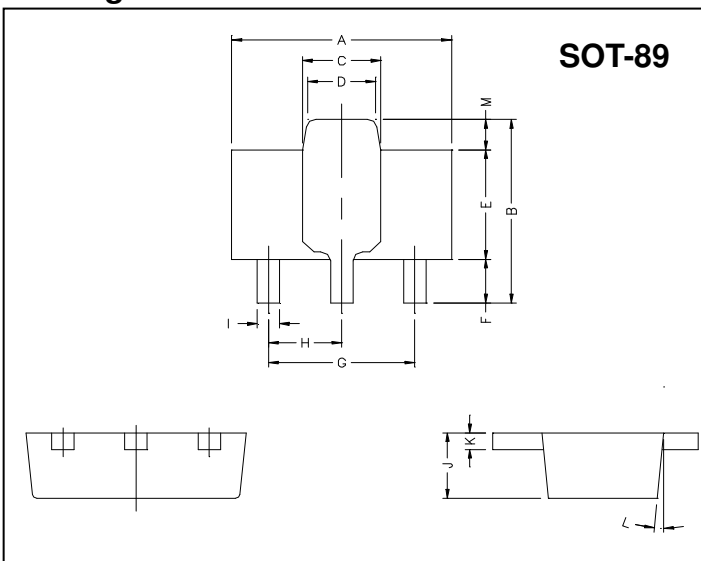
The SOT-89 package is universally preferred for all commercial-industrial surface mount applications and suited for low voltage and battery power applications.

### Features

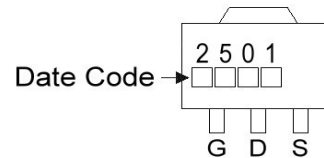
- \*Simple Drive Requirement
- \*Surface Mount Device



### Package Dimensions



### Marking :



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	4.4	4.6	G	3.00	REF.
B	4.05	4.25	H	1.50	REF.
C	1.50	1.70	I	0.40	0.52
D	1.30	1.50	J	1.40	1.60
E	2.40	2.60	K	0.35	0.41
F	0.89	1.20	L	5° TYP.	
			M	0.70 REF.	

### Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	$V_{DS}$	-20	V
Gate-Source Voltage	$V_{GS}$	±12	V
Continuous Drain Current <sup>3</sup>	$I_D @ TA=25^{\circ}C$	-2.6	A
Continuous Drain Current <sup>3</sup>	$I_D @ TA=70^{\circ}C$	-2.1	A
Pulsed Drain Current <sup>1,2</sup>	$I_{DM}$	-10	A
Total Power Dissipation	$P_D @ TA=25^{\circ}C$	1.5	W
Linear Derating Factor		0.012	W/°C
Operating Junction and Storage Temperature Range	$T_j, T_{stg}$	-55 ~ +150	°C

### Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance Junction-ambient Max.	$R_{thj-a}$	83.3	°C/W

**Electrical Characteristics (T<sub>j</sub> = 25°C unless otherwise specified)**

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	-20	-	-	V	V <sub>GS</sub> =0, I <sub>D</sub> =-250uA
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS} / \Delta T_j$	-	-0.1	-	V/°C	Reference to 25°C, I <sub>D</sub> =-1mA
Gate Threshold Voltage	V <sub>GS(th)</sub>	-0.5	-	-	V	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250uA
Forward Transconductance	g <sub>fs</sub>	-	4.4	-	S	V <sub>DS</sub> =-5V, I <sub>D</sub> =-2.6A
Gate-Source Leakage Current	I <sub>GSS</sub>	-	-	±100	nA	V <sub>GS</sub> = ±12V
Drain-Source Leakage Current(T <sub>j</sub> =25°C)	I <sub>DSS</sub>	-	-	-1	uA	V <sub>DS</sub> =-20V, V <sub>GS</sub> =0
Drain-Source Leakage Current(T <sub>j</sub> =70°C)		-	-	-10	uA	V <sub>DS</sub> =-16V, V <sub>GS</sub> =0
Static Drain-Source On-Resistance <sup>2</sup>	R <sub>DS(ON)</sub>	-	-	200	mΩ	V <sub>GS</sub> =-10V, I <sub>D</sub> =-2.6A
		-	-	250		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-2.0A
		-	-	300		V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-1.0A
Total Gate Charge <sup>2</sup>	Q <sub>g</sub>	-	5.2	10	nC	I <sub>D</sub> =-2.8A
Gate-Source Charge	Q <sub>gs</sub>	-	1.36	-		V <sub>DS</sub> =-6V
Gate-Drain ("Miller") Change	Q <sub>gd</sub>	-	0.6	-		V <sub>GS</sub> =-5V
Turn-on Delay Time <sup>2</sup>	T <sub>d(on)</sub>	-	5.2	-	ns	V <sub>DS</sub> =-15V
Rise Time	T <sub>r</sub>	-	9.7	-		I <sub>D</sub> =-1A
Turn-off Delay Time	T <sub>d(off)</sub>	-	19	-		V <sub>GS</sub> =-10V
Fall Time	T <sub>f</sub>	-	29	-		R <sub>G</sub> =6Ω R <sub>D</sub> =15Ω
Input Capacitance	C <sub>iss</sub>	-	295	-	pF	V <sub>GS</sub> =0V
Output Capacitance	C <sub>oss</sub>	-	170	-		V <sub>DS</sub> =-6V
Reverse Transfer Capacitance	C <sub>rss</sub>	-	65	-		f=1.0MHz

**Source-Drain Diode**

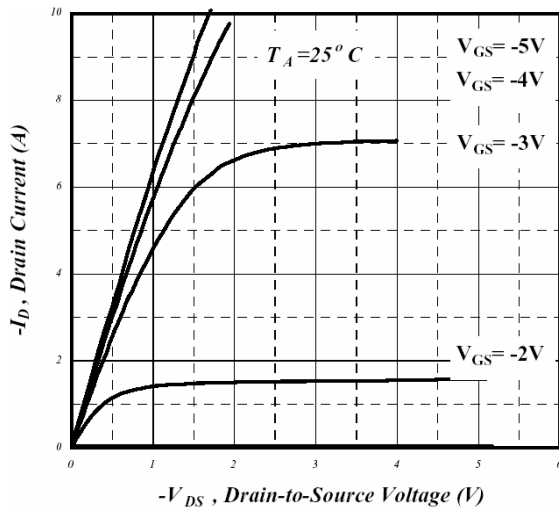
Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Forward On Voltage <sup>2</sup>	V <sub>SD</sub>	-	-	-1.2	V	I <sub>S</sub> =-1.6A, V <sub>GS</sub> =0V, T <sub>j</sub> =25°C
Continuous Source Current (Body Diode)	I <sub>S</sub>	-	-	-1	A	V <sub>D</sub> =V <sub>G</sub> =0V, V <sub>S</sub> =-1.2V
Pulsed Source Current (Body Diode) <sup>1</sup>	I <sub>SM</sub>	-	-	-10	A	

Notes: 1. Pulse width limited by Max. junction temperature.

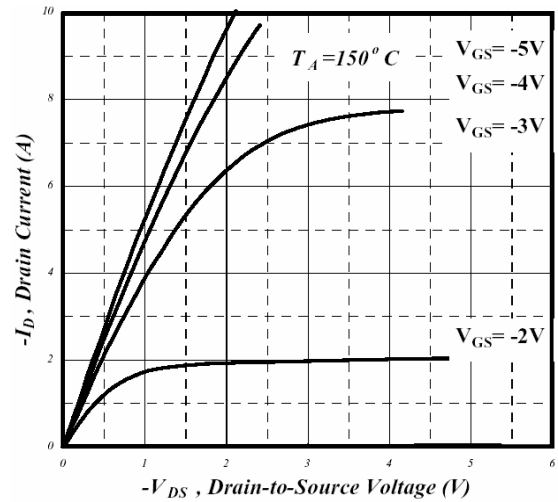
2. Pulse width ≤ 300us, duty cycle ≤ 2%.

3. Surface mounted on FR4 board, t ≤ 10sec.

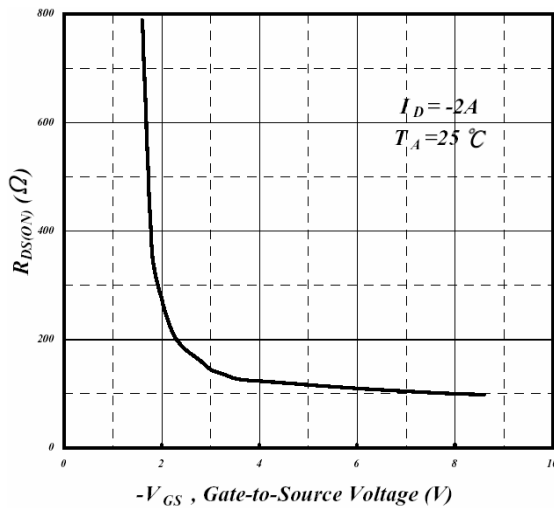
## Characteristics Curve



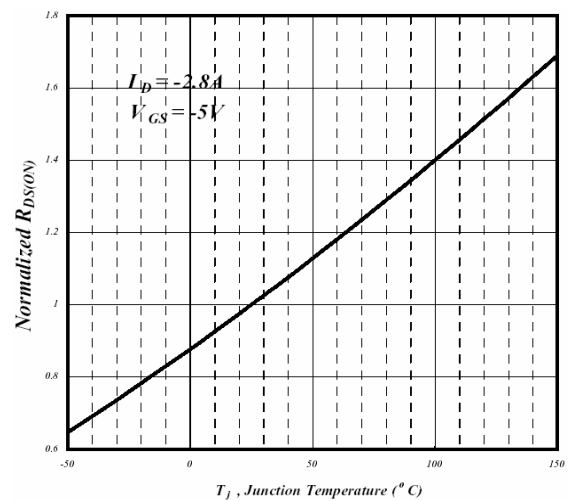
**Fig 1. Typical Output Characteristics**



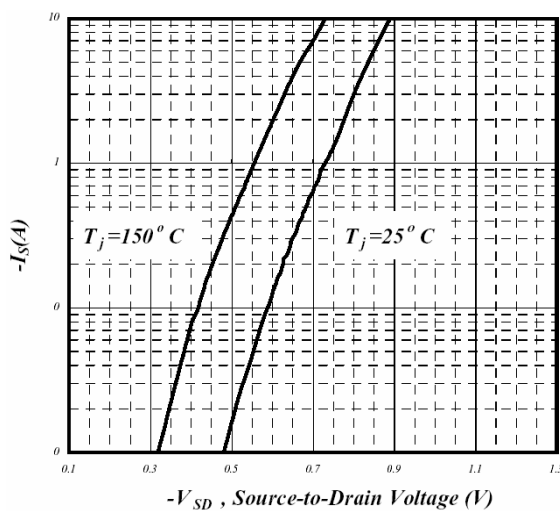
**Fig 2. Typical Output Characteristics**



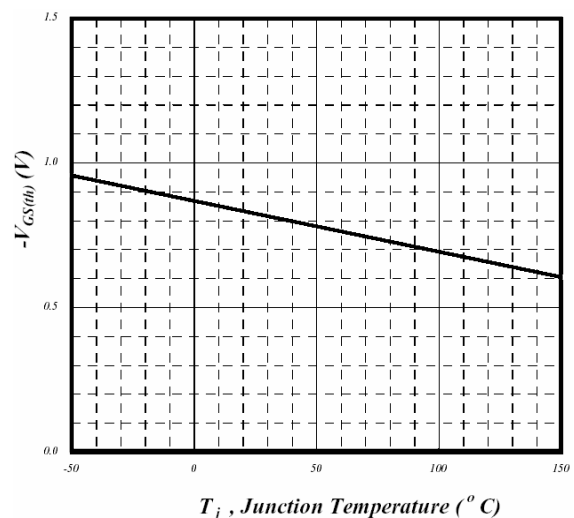
**Fig 3. On-Resistance v.s. Gate Voltage**



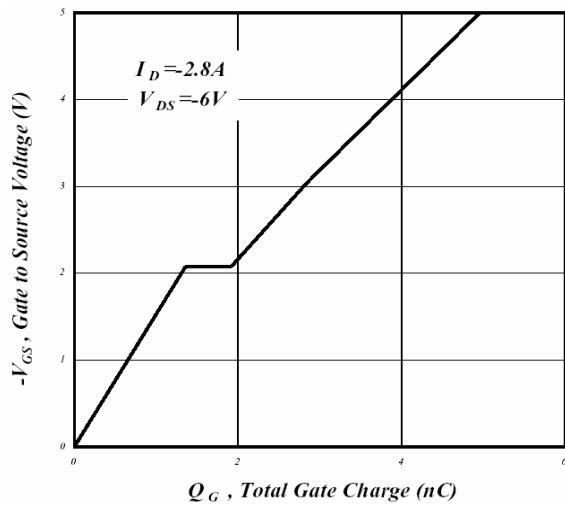
**Fig 4. Normalized On-Resistance v.s. Junction Temperature**



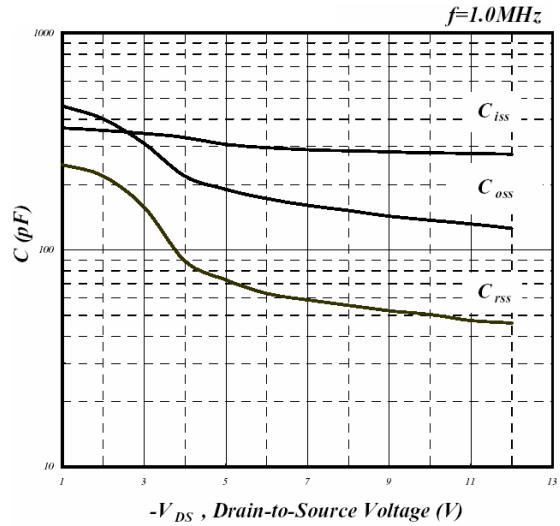
**Fig 5. Forward Characteristics of Reverse Diode**



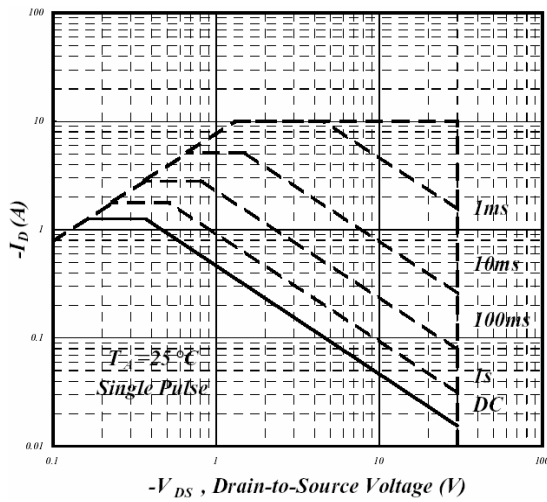
**Fig 6. Gate Threshold Voltage v.s. Junction Temperature**



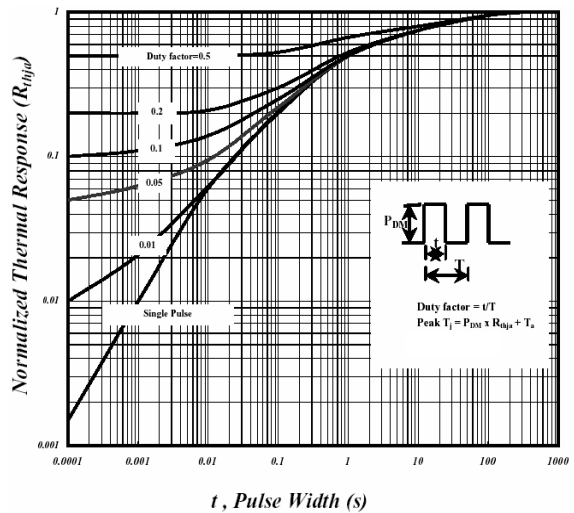
**Fig 7. Gate Charge Characteristics**



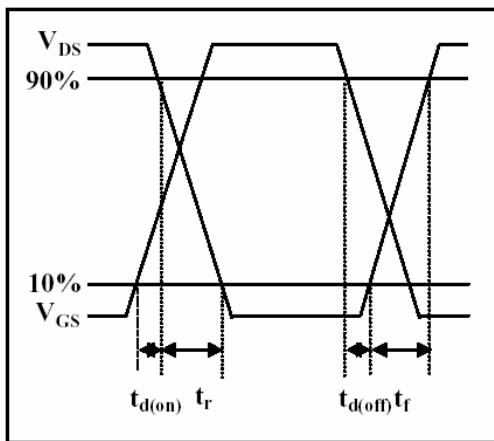
**Fig 8. Typical Capacitance Characteristics**



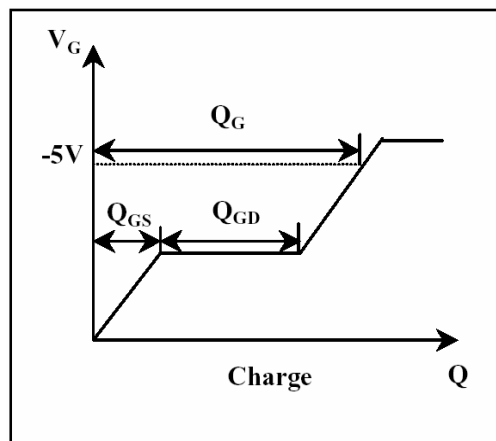
**Fig 9. Maximum Safe Operating Area**



**Fig 10. Effective Transient Thermal Impedance**



**Fig 11. Switching Time Waveform**



**Fig 12. Gate Charge Waveform**

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