

# GSMDP0966A

## 100V N-Channel MOSFETs

### Product Description

These N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode.

These devices are well suited for high efficiency fast switching applications.


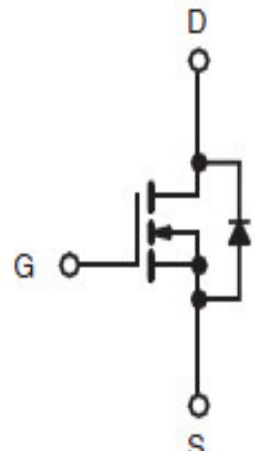
### Features

- 100V, 60A,  $R_{DS(ON)}=18m\Omega@V_{GS}=10V$
- Improved dv/dt capability
- Fast switching
- 100% EAS guaranteed
- Green Device Available
- TO-220 package design

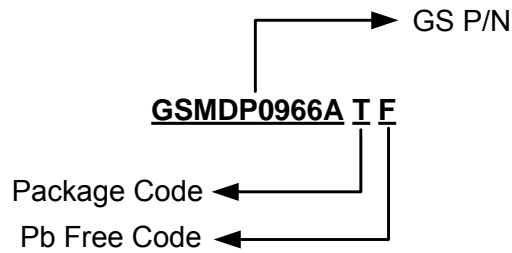
### Applications

- Networking
- Load Switch
- LED Applications

### Packages & Pin Assignments

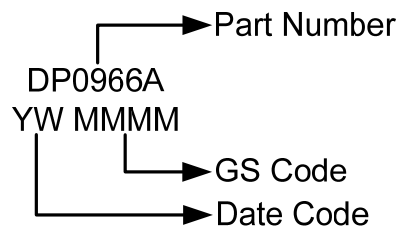
GSMDP0966ATF (TO-220)	
 <p>Top View</p>	
	
Pin	Description
1	Gate
2	Drain
3	Source

## Ordering Information



Part Number	Package	Quantity Tube
GSMDP0966ATF	TO-220	50 PCS

## Marking Information



## Absolute Maximum Ratings

T<sub>A</sub>=25°C Unless otherwise noted

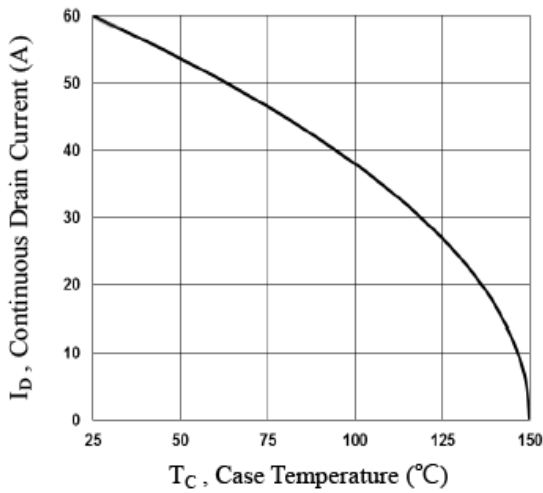
Symbol	Parameter	Typical	Unit
V <sub>DS</sub>	Drain-Source Voltage	100	V
V <sub>GS</sub>	Gate-Source Voltage	±20	V
I <sub>D</sub>	Continuous Drain Current	T <sub>A</sub> =25°C	60
		T <sub>A</sub> =100°C	38
I <sub>DM</sub>	Pulsed Drain Current	180	A
EAS	Single Pulse Avalanche Energy	100	mJ
IAS	Single Pulse Avalanche Current	45	A
P <sub>D</sub>	Power Dissipation (T <sub>A</sub> =25°C)	113	W
	Power Dissipation (Derate above 25°C)	0.9	W/°C
T <sub>J</sub>	Operating Junction Temperature Range	-50 to +150	°C
T <sub>STG</sub>	Storage Temperature Range	-50 to +150	°C
R <sub>θJA</sub>	Thermal Resistance-Junction to Ambient	62	°C/W
R <sub>θJC</sub>	Thermal Resistance-Junction to Case	1.1	°C/W

## Electrical Characteristics

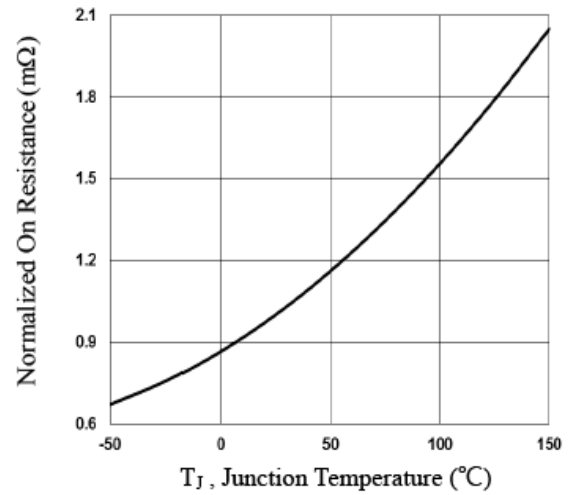
T<sub>A</sub>=25°C Unless otherwise noted

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Static</b>						
V <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	100			V
ΔBV <sub>DSS</sub> /ΔT <sub>J</sub>	BV <sub>DSS</sub> Temperature Coefficient	Reference to 25°C, I <sub>D</sub> =1mA		0.05		V/°C
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	2		4	V
ΔV <sub>GS(th)</sub>	V <sub>GS(th)</sub> Temperature Coefficient			-5		mV/°C
I <sub>GSS</sub>	Gate Leakage Current	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V			±100	nA
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =100V, V <sub>GS</sub> =0V			1	uA
		V <sub>DS</sub> =80V, V <sub>GS</sub> =0V, T <sub>J</sub> =125°C			10	
I <sub>S</sub>	Continuous Source Current	V <sub>G</sub> =V <sub>D</sub> =0V, Force Current			60	A
I <sub>SM</sub>	Pulsed Source Current				120	
R <sub>DS(on)</sub>	Drain-Source On-Resistance	V <sub>GS</sub> =10V, I <sub>D</sub> =25A		15	18	mΩ
		V <sub>GS</sub> =6V, I <sub>D</sub> =15A		20	28	mΩ
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> =10V, I <sub>D</sub> =3A		10		S
V <sub>SD</sub>	Diode Forward Voltage	V <sub>GS</sub> =0V, I <sub>S</sub> =1A			1	V
<b>Dynamic</b>						
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =50V, V <sub>GS</sub> =10V, I <sub>D</sub> =5A		37.6	70	nC
Q <sub>gs</sub>	Gate-Source Charge			11.7	22	
Q <sub>gd</sub>	Gate-Drain Charge			9.8	19	
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =50V, V <sub>GS</sub> =0V, f=1MHz		1850	3300	pF
C <sub>oss</sub>	Output Capacitance			160	300	
C <sub>rss</sub>	Reverse Transfer Capacitance			85	160	
t <sub>d(on)</sub>	Turn-On Time	V <sub>DD</sub> =50V, I <sub>D</sub> =1A, V <sub>GS</sub> =10V, R <sub>G</sub> =6Ω		20	40	ns
t <sub>r</sub>				15	30	
t <sub>d(off)</sub>	Turn-Off Time			45	80	
t <sub>f</sub>				21	40	
R <sub>g</sub>	Gate Resistance		V <sub>DS</sub> =0V, V <sub>GS</sub> =0V, f=1MHz		1.35	

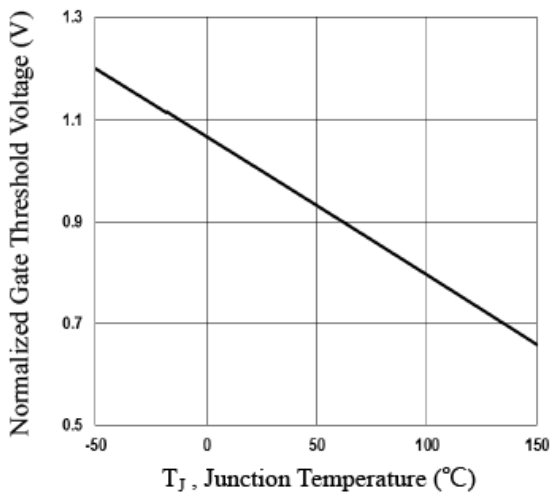
## Typical Performance Characteristics



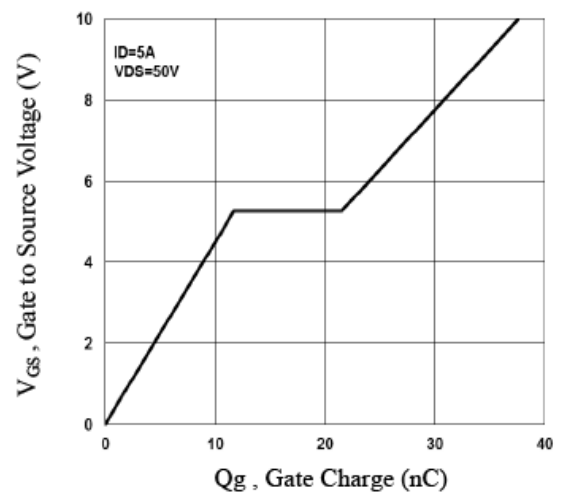
**Fig.1** Continuous Drain Current vs.  $T_c$



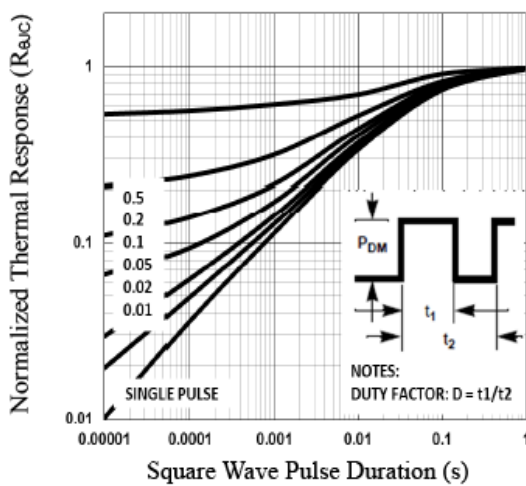
**Fig.2** Normalized  $R_{DS(on)}$  vs.  $T_j$



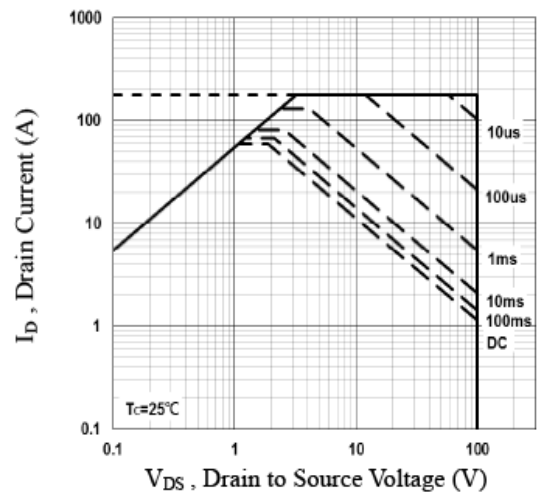
**Fig.3** Normalized  $V_{th}$  vs.  $T_j$



**Fig.4** Gate Charge Characteristics



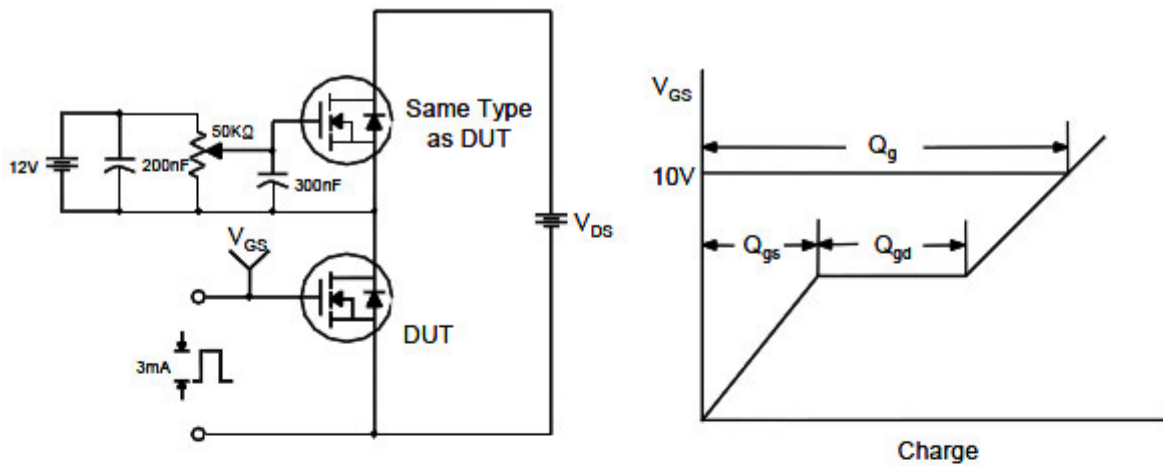
**Fig.5** Normalized Transient Impedance



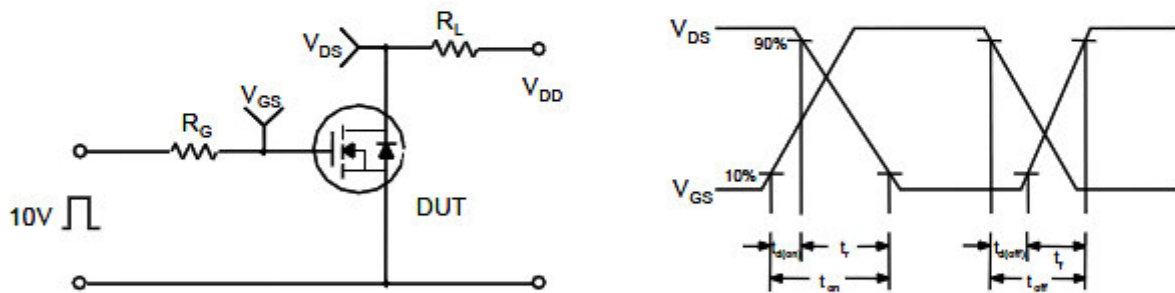
**Fig.6** Maximum Safe Operation Area

## Typical Performance Characteristics (Continue)

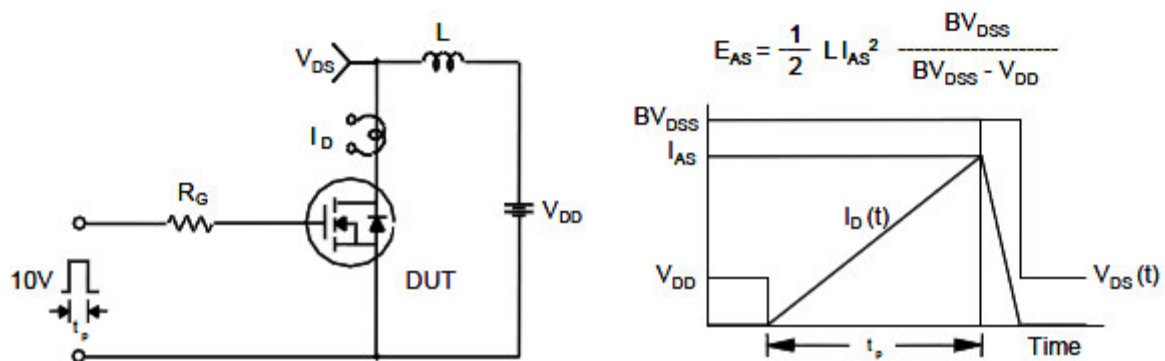
### Gate Charge Test Circuit & Waveform



### Resistive Switching Test Circuit & Waveforms

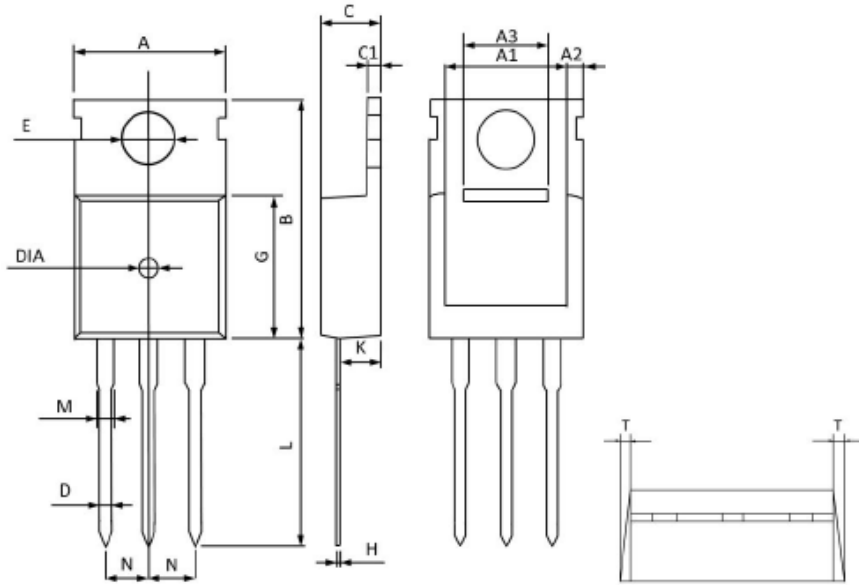


### Unclamped Inductive Switching Test Circuit & Waveforms



## Package Dimension

### TO-220










Dimensions				
Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	9.70	10.30	0.382	0.406
A1	8.44	8.84	0.332	0.348
A2	1.05	1.25	0.041	0.049
A3	5.10	5.30	0.201	0.209
B	15.40	16.20	0.606	0.638
C	4.28	4.68	0.169	0.184
C1	1.10	1.50	0.043	0.059
D	0.60	1.00	0.024	0.039
E	3.40	3.80	0.134	0.150
G	8.70	9.30	0.343	0.366
H	0.40	0.60	0.016	0.024
K	2.10	2.70	0.083	0.106
L	12.80	13.60	0.504	0.535
M	1.10	1.50	0.043	0.059
N	2.49	2.59	0.098	0.102
T	W0.35		W0.014	
DIA	Φ1.5(TYP)	Deep0.2(TYP)	Φ0.059(TYP)	Deep0.008(TYP)



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