

# GSM22N10DF

## 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.

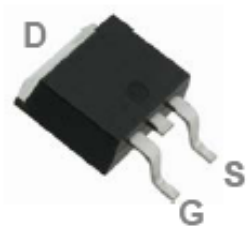
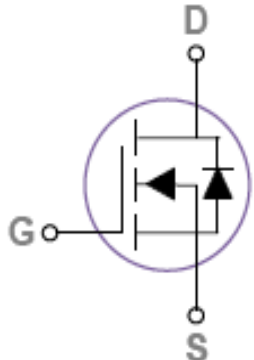
### Features

- 100V, 40A,  $R_{DS(ON)}=22m\Omega@V_{GS}=10V$
- Improved dv/dt capability
- Fast switching
- 100% EAS guaranteed
- Green Device Available
- TO-252-2L package design

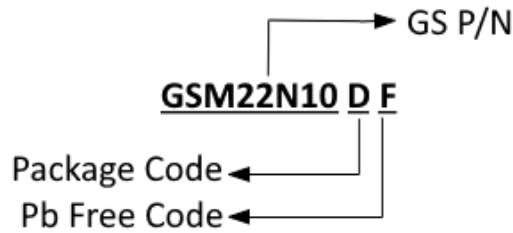
### Applications

- Networking
- Load Switch
- LED applications

### Packages & Pin Assignments

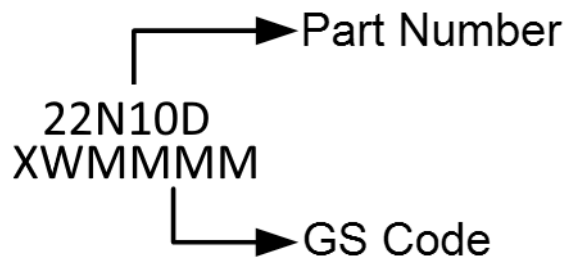
GSM22N10DF (TO-252-2L)	
 <p>Top View</p>	
<b>Description</b>	
Gate	
Source	
Drain	

## Ordering Information



Part Number	Package	Quantity Reel
GSM22N10DF	TO-252-2L	2500 PCS

## Marking Information



## Absolute Maximum Ratings

$T_C=25^\circ\text{C}$  Unless otherwise noted

Symbol	Parameter	Typical	Unit
$V_{DS}$	Drain-Source Voltage	100	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D$	Continuous Drain Current <sup>1</sup>	$T_C=25^\circ\text{C}$	40
		$T_C=70^\circ\text{C}$	22
$I_{DM}$	Pulsed Drain Current <sup>2</sup>	75	A
EAS	Single Pulse Avalanche Energy <sup>3</sup>	16	mJ
$I_{AS}$	Single Pulse Avalanche Current	18	A
$P_D$	Power Dissipation $T_C=25^\circ\text{C}$	62.5	W
$T_J$	Operating Junction Temperature Range	-50 to +150	$^\circ\text{C}$
$T_{STG}$	Storage Temperature Range	-50 to +150	$^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	50	$^\circ\text{C}/\text{W}$
$R_{\theta JC}$	Thermal Resistance-Junction to Case	2	$^\circ\text{C}/\text{W}$

## Electrical Characteristics

T<sub>J</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> =250μA	100			V	
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1	2	3	V	
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	μA	
I <sub>S</sub>	Continuous Source Current	V <sub>G</sub> =V <sub>D</sub> =0V, Force Current			40	A	
R <sub>DS(on)</sub>	Drain-Source On-Resistance <sup>2</sup>	V <sub>GS</sub> =10V, I <sub>D</sub> =25A		15.5	22	mΩ	
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =6A		18	28	mΩ	
g <sub>Fs</sub>	Forward Transconductance	V <sub>DS</sub> =10V, I <sub>D</sub> =3A		14		S	
V <sub>SD</sub>	Diode Forward Voltage	V <sub>GS</sub> =0V, I <sub>S</sub> =1A			1	V	
<b>Dynamic</b>							
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =15V, V <sub>GS</sub> =0V, f=1MHz		1930		pF	
C <sub>oss</sub>	Output Capacitance			245			
C <sub>rss</sub>	Reverse Transfer Capacitance			125			
R <sub>g</sub>	Gate Resistance	V <sub>DS</sub> =0V, V <sub>GS</sub> =0V, f=1MHz		1.6		Ω	
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =80V, V <sub>GS</sub> =10V, I <sub>D</sub> =7A		36		nC	
Q <sub>gs</sub>	Gate-Source Charge			5			
Q <sub>gd</sub>	Gate-Drain Charge			10			
t <sub>d(on)</sub>	Turn-On Time	V <sub>DD</sub> =50V, I <sub>D</sub> =3.3A, V <sub>GS</sub> =10V, R <sub>G</sub> =7Ω		11.5		ns	
t <sub>r</sub>				29			
t <sub>d(off)</sub>			Turn-Off Time		42		
t <sub>f</sub>					18		

Note :

- 1.The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper.
- 2.The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%.
- 3.The EAS data shows Max. rating. The test condition is V<sub>DD</sub>=25V, V<sub>GS</sub>=10V, L=0.1mH.

## Typical Performance Characteristics

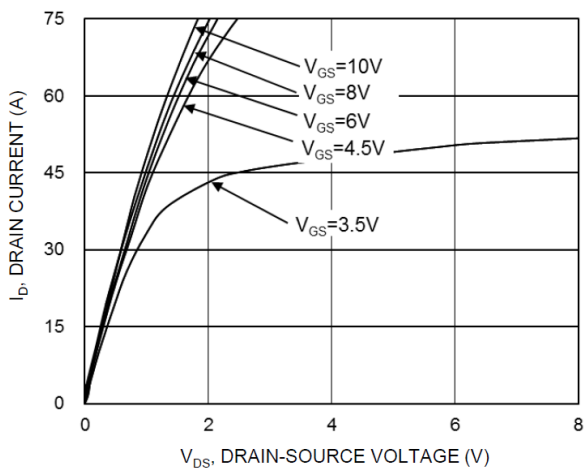


Fig. 1 Typical Output Characteristics

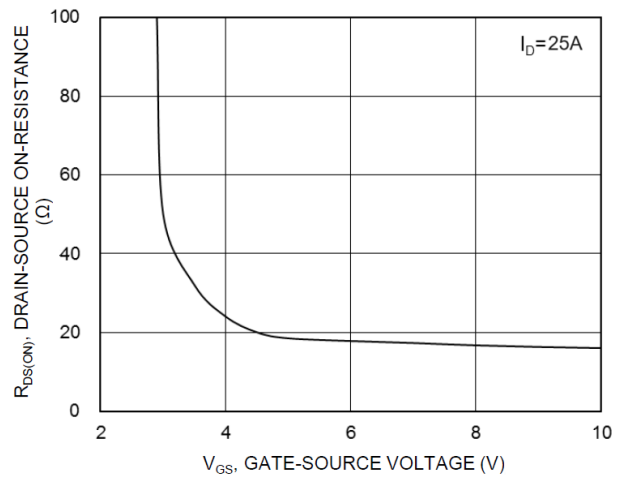


Fig. 2 Typical Transfer Characteristics

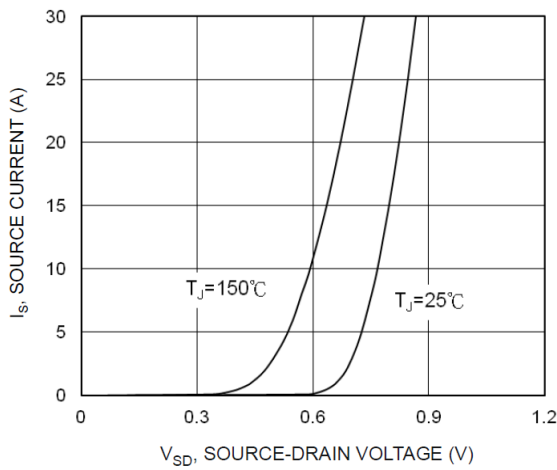


Fig. 3 Diode Forward Voltage vs. Current

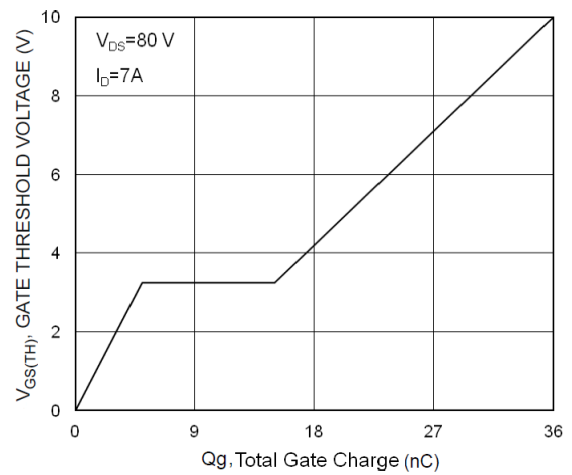


Fig. 4 Gate Charge

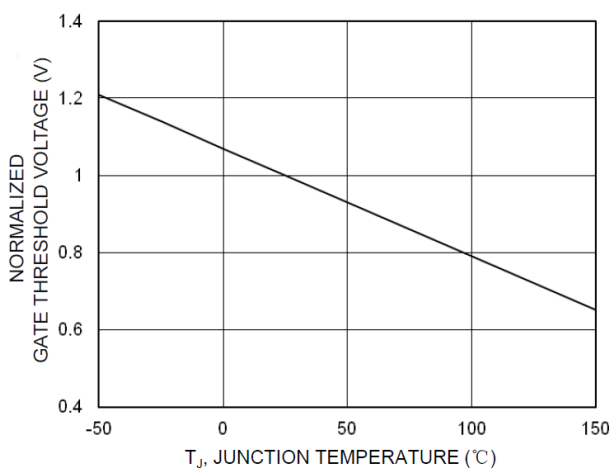


Fig. 5 Gate Threshold Variation vs.  $T_J$

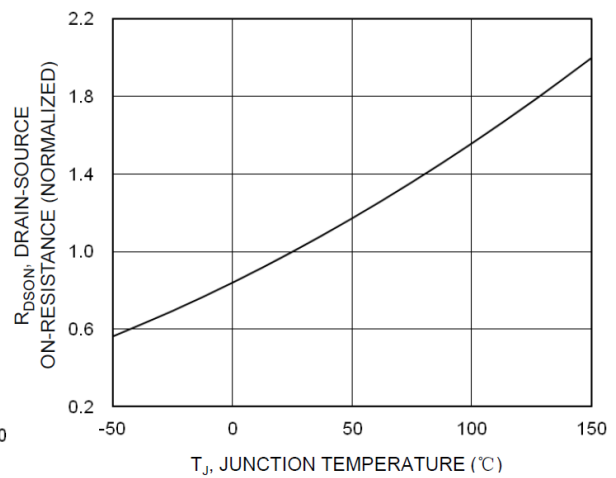


Fig. 6 On-Resistance Variation with  $T_J$

## Typical Performance Characteristics (continue)

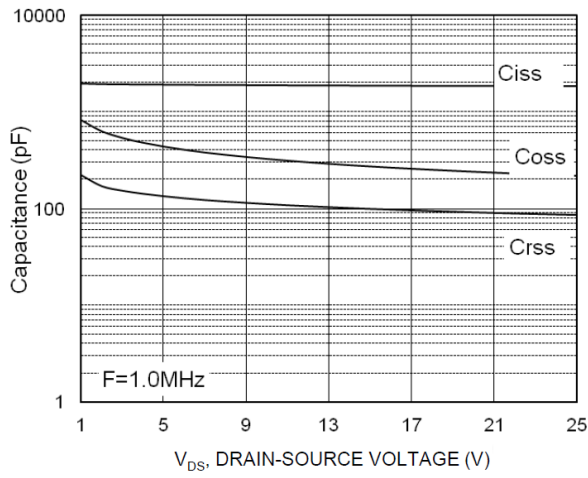


Fig. 7 Typical Capacitance

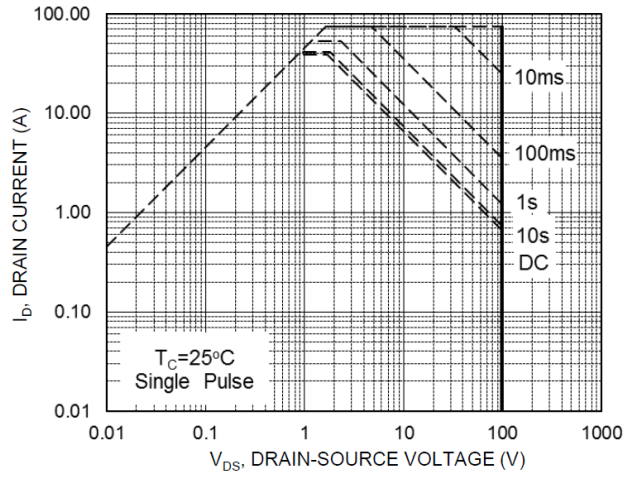


Fig. 8 Safe Operating Area

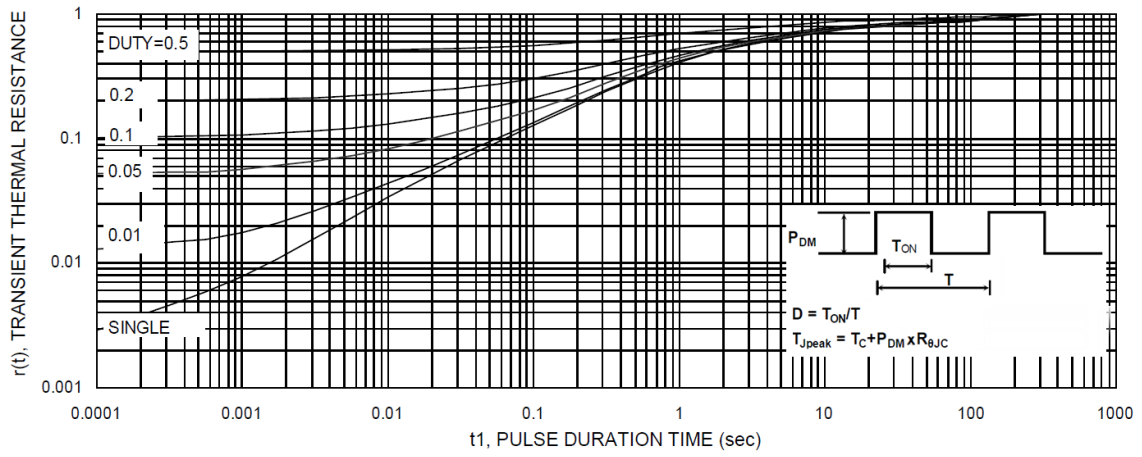
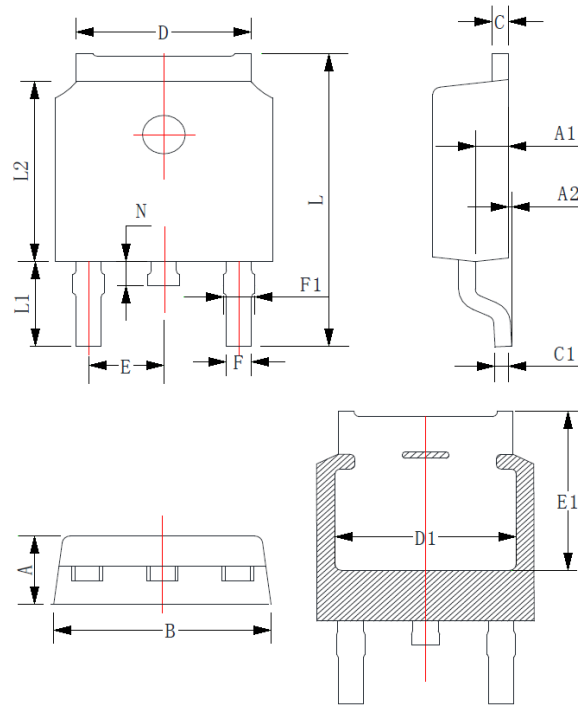


Fig. 9 Transient Thermal Response

## Package Dimension

### TO252-2L









Dimensions				
SYMBOL	Millimeters		Inches	
	MIN	MAX	MIN	MAX
A	2.200	2.400	0.087	0.094
A1	0.910	1.110	0.036	0.043
A2	-	0.250	-	0.010
B	6.500	6.700	0.256	0.264
C	0.400	0.600	0.016	0.023
C1	0.400	0.600	0.016	0.023
D	5.150	5.450	0.203	0.214
D1	5.100	5.400	0.200	0.212
E	2.200	2.400	0.087	0.094
E1	4.950	5.350	0.195	0.210
F	0.660	0.860	0.026	0.034
F1	0.700	0.950	0.028	0.037
L	9.700	10.100	0.382	0.397
L1	2.670	3.070	0.105	0.121
L2	6.000	6.200	0.236	0.244
N	0.600	1.000	0.024	0.039

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