

# GSM3080DF

## 30V 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.

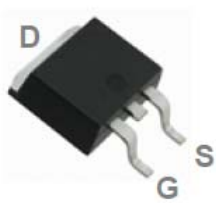
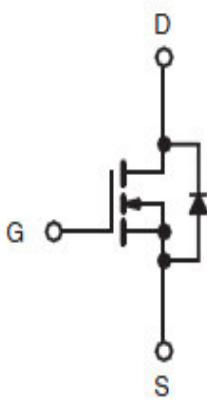
### Features

- 30V, 86A,  $R_{DS(ON)} < 5m\Omega @ V_{GS}=10V$ ,  $R_{DS(ON)} < 9.5m\Omega @ V_{GS}=4.5V$
- High Power and current handling capability
- Lead free product is acquired
- TO-252-2L package design

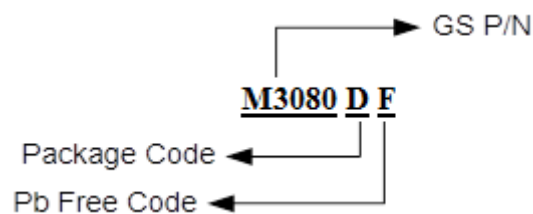
### Applications

- PWM applications
- Load switch
- Power management

### Packages & Pin Assignments

GSM3080DF (TO-252-2L)		
 <p>Top View</p>		
<b>Description</b>		
Gate		
Drain		
Source		

### Ordering Information



Part Number	Package	Quantity
GSM3080DF	TO-252-2L	2500pcs

## Absolute Maximum Ratings

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

Symbol	Parameter	Typical	Unit
V <sub>DS</sub>	Drain-Source Voltage	30	V
V <sub>GS</sub>	Gate-Source Voltage	±20	V
I <sub>D</sub>	Continuous Drain Current	T <sub>A</sub> =25°C <sup>1</sup>	86
		T <sub>A</sub> =100°C	60
I <sub>DM</sub>	Pulsed Drain Current <sup>2</sup>	344	A
E <sub>AS</sub>	Single Pulse Avalanche Energy <sup>3</sup>	270	mJ
P <sub>D</sub>	Power Dissipation T <sub>A</sub> =25°C	83	W
	Power Dissipation T <sub>A</sub> =100°C	42	W/°C
T <sub>J</sub>	Operating Junction Temperature Range	-55 to +175	°C
T <sub>STG</sub>	Storage Temperature Range	-55 to +175	°C
R <sub>θJC</sub>	Thermal Resistance-Junction to Case	1.8	°C/W

Note :

- 1.The maximum current rating is package limited..
- 2.Repetitive Rating: Pulse width limited by maximum junction temperature.
- 3.E<sub>AS</sub> condition: T<sub>J</sub>=25°C, V<sub>DD</sub>=30V, V<sub>G</sub>=10V, R<sub>G</sub>=25Ω

## 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	30			V
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	1.0	1.5	2.5	V
I <sub>GSS</sub>	Gate Leakage Current	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V			±100	nA
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V			1	uA
I <sub>SD</sub>	Source-Drain Current (Body Diode)				86	A
V <sub>SD</sub>	Diode Forward Voltage <sup>3</sup>	V <sub>GS</sub> =0V, I <sub>S</sub> =20A			1.2	V
t <sub>rr</sub>	Body Diode Reverse Recovery Time	I <sub>F</sub> =20A, dI/dt=100A/us		15		ns
Q <sub>rr</sub>	Body Diode Reverse Recovery Charge	I <sub>F</sub> =20A, dI/dt=100A/us		4		nC
R <sub>DS(on)</sub>	Drain-Source On-Resistance <sup>3</sup>	V <sub>GS</sub> =10V, I <sub>D</sub> =20A		3.6	5	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =20A		6	9.5	
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> =5V, I <sub>D</sub> =15A		24		S
<b>Dynamic</b>						
Q <sub>g</sub>	Total Gate Charge <sup>3,4</sup>	V <sub>DS</sub> =25V, V <sub>GS</sub> =10V, I <sub>D</sub> =14A		45		nC
Q <sub>gs</sub>	Gate-Source Charge <sup>3,4</sup>			3		
Q <sub>gd</sub>	Gate-Drain Charge <sup>3,4</sup>			15		
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =15V, V <sub>GS</sub> =0V, f=1.0MHz		1980		pF
C <sub>oss</sub>	Output Capacitance			320		
C <sub>rss</sub>	Reverse Transfer Capacitance			240		

## Electrical Characteristics(Continue)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Dynamic</b>						
$t_{d(on)}$	Turn-On Time	$V_{DS}=15V, V_{GS}=10V,$ $R_L=0.75\Omega, R_{GEN}=3\Omega$		12		ns
$t_r$	Rise Time			36		
$t_{d(off)}$	Turn-Off Time			49		
$t_f$	Fall Time			12		
$R_g$	Gate Resistance	$V_{GS}=0V, V_{DS}=0V,$ $f=1.0MHz$		3.2		$\Omega$

## Typical Performance Characteristics

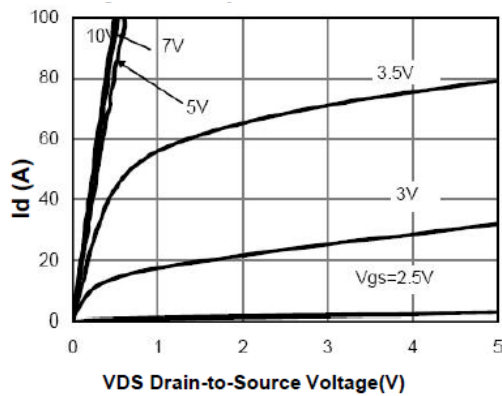


Figure 1. Output Characteristics

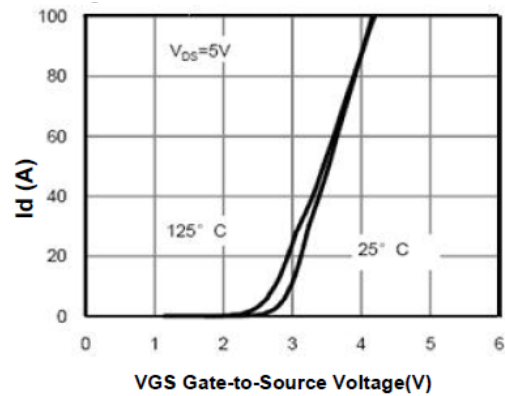


Figure 2. Transfer Characteristics

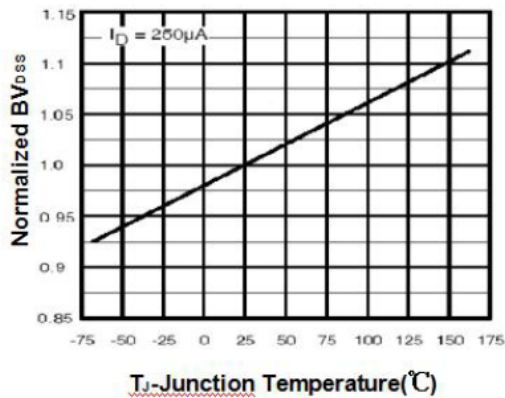


Figure 3. Max  $BV_{DS}$  vs Junction Temperature

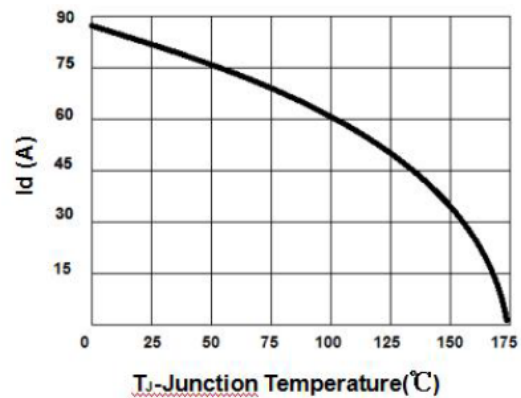


Figure 4. Drain Current

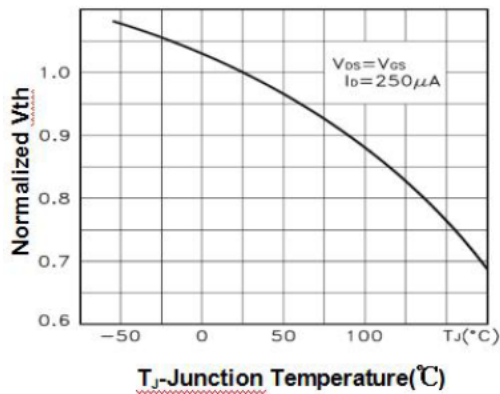


Figure 5.  $V_{GS(th)}$  vs Junction Temperature

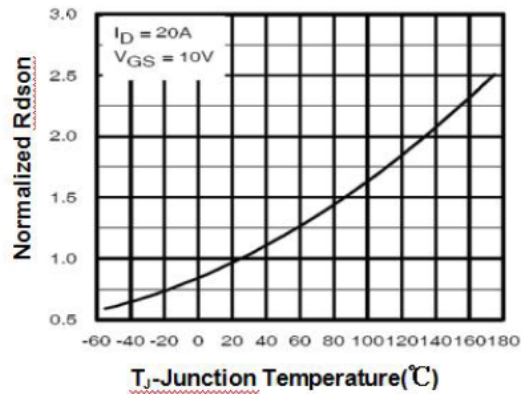


Figure 6.  $R_{DS(ON)}$  vs Junction Temperature

## Typical Performance Characteristics (Continue)

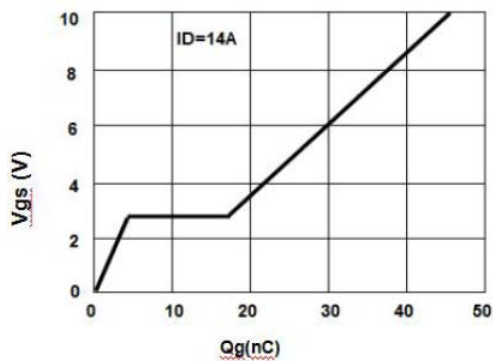


Figure 7. Gate Charge Waveforms

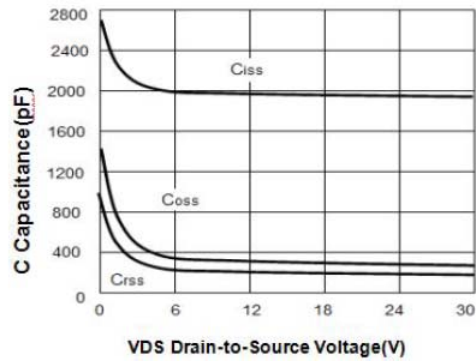


Figure 8. Capacitance

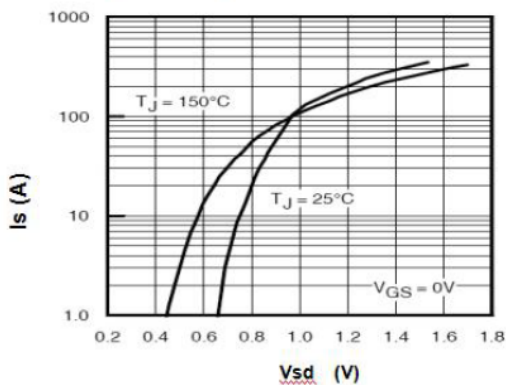


Figure 9. Body-Diode Characteristics

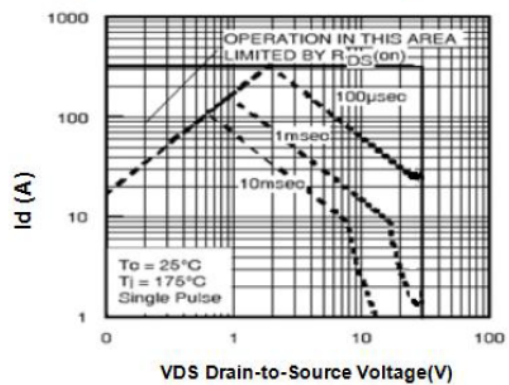
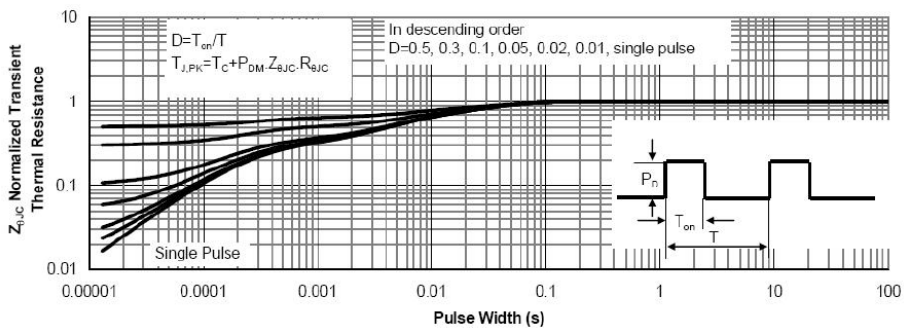
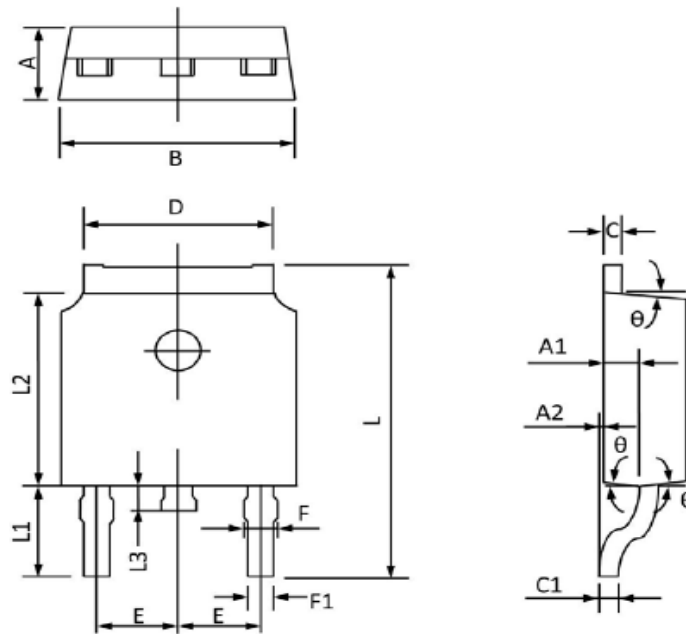


Figure 10. Maximum Safe Operating Area



Package Dimension

TO-252-2L







Dimensions				
Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	2.20	2.40	0.087	0.094
A1	0.91	1.11	0.036	0.044
A2	0.00	0.15	0.000	0.006
B	6.50	6.70	0.256	0.264
C	0.46	0.58	0.018	0.030
C1	0.46	0.58	0.018	0.030
D	5.10	5.46	0.201	0.215
E	2.186	2.386	0.086	0.094
F	0.74	0.94	0.029	0.037
F1	0.66	0.86	0.026	0.034
L	9.80	10.40	0.386	0.409
L1	2.9 (REF)		0.114 (REF)	
L2	6.00	6.20	0.236	0.244
L3	0.60	1.00	0.024	0.039
θ	3°	9°	3°	9°





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