GSM10N10DF

100V N-Channel MOSFETs

Product Description

The GSM10N10DF is the high cell density trenched N-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

The GSM10N10DF meet the RoHS and Green Product requirement with full function reliability approved.

Features

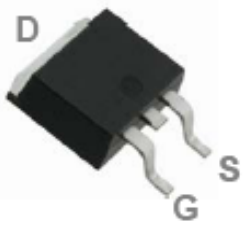
- 100V, 9A, RDS(ON)=152mΩ@V_{GS}=20V
- Improved dv/dt capability
- Fast switching
- 100% EAS Guaranteed
- Green Device Available
- To-252 package design

Applications

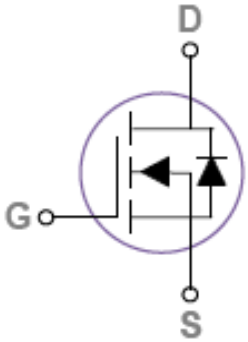
- Notebook
- Load Switch
- LED applications

Packages & Pin Assignments

GSM10N10DF (TO-252)

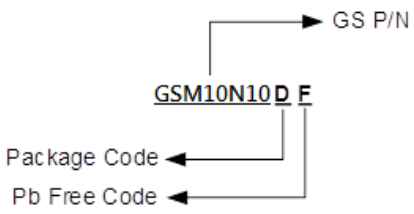


Top View



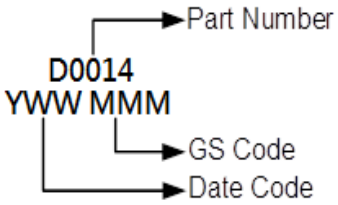
Description
Gate
Source
Drain

Ordering Information



Part Number	Package	Quantity Reel
GSM10N10DF	TO-252	2500 PCS

Marking Information



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ 10V[1]	9	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V[1]	5.7	A
I_D@T_A=25℃	Continuous Drain Current, V_{GS} @ 10V[1]	2.3	A
I_D@T_A=70℃	Continuous Drain Current, V_{GS} @ 10V[1]	1.8	A
I_{DM}	Pulsed Drain Current[2]	18	A
P_D@T_A=25℃	Total Power Dissipation[3]	31	W
P_D@T_C=25℃	Total Power Dissipation[3]	2	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient [1]	---	62	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	---	4	℃/W

Electrical Characteristics (TJ=25 ℃, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	100	---	---	V
$\Delta BV_{DSS}/\Delta T_J$	BVDSS Temperature Coefficient	Reference to 25℃ , I_D=1mA	---	0.122	---	V/℃
$R_{DS(ON)}$	Static Drain-Source On-Resistance2	V_{GS}=10V , I_D=8A	---	---	152	mΩ

$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=4.5V , I_D=6A	---	---	158	mΩ
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient	V_{GS}=V_{DS} , I_D =250uA	1.0	---	2.5	V
			---	-4.84	---	mV℃
I_{DSS}	Drain-Source Leakage Current	V_{DS}=80V , V_{GS}=0V , T_J=25℃	---	---	10	uA
		V_{DS}=80V , V_{GS}=0V , T_J=55℃	---	---	100	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=5V , I_D=8A	---	10.2	---	S
Rg	Gate Resistance	VDS=0V , VGS=0V , f=1MHz	---	2.3-	---	Ω
Qg	Total Gate Charge (10V)	V_{DS}=60V , V_{GS}=10V , I_D=8A	---	25.5	---	nC
Qgs	Gate-Source Charge		---	4.2	---	
Qgd	Gate-Drain Charge		---	4.3	---	
Td(on)	Turn-On Delay Time	V_{DD}=50V , V_{GS}=10V , R_G=3.3Ω I_D=1A	---	17.3	---	ns
Tr	Rise Time		---	2.8	---	
Td(off)	Turn-Off Delay Time		---	50	---	
Tf	Fall Time		---	2.8	---	
Ciss	Input Capacitance	V_{DS}=15V , V_{GS}=0V , f=1MHz	---	1077	---	pF
Coss	Output Capacitance		---	46	---	
Crss	Reverse Transfer Capacitance		---	32	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current[1,4]	V_G=V_D=0V , Force Current	---	---	9	A
I_{SM}	Pulsed Source Current[2,4]		---	---	18	A
V_{SD}	Diode Forward Voltage[2]	V_{GS}=0V , I_S=1A , T_J=25℃	---	---	1.2	V
t_{rr}	Reverse Recovery Time	IF=8A , dI/dt=100A/μs , T_J=25℃	---	30	---	nS
Q_{rr}	Reverse Recovery Charge		---	16	---	nC

Note :

1.The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper.

2.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%

3.The power dissipation is limited by 150℃ junction temperature

4.The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

Typical Characteristics

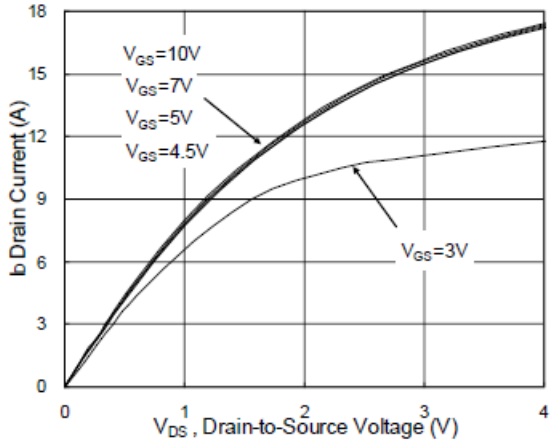


Fig.1 Typical Output Characteristics

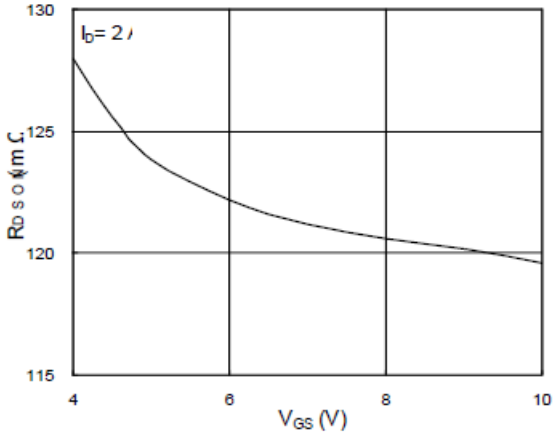


Fig.2 On-Resistance vs. Gate-Source

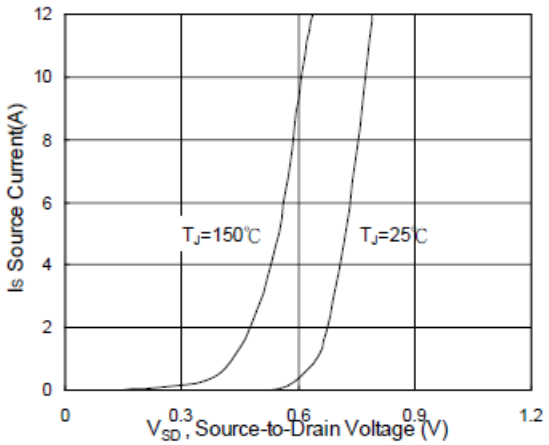


Fig.3 Forward Characteristics Of Reverse diode

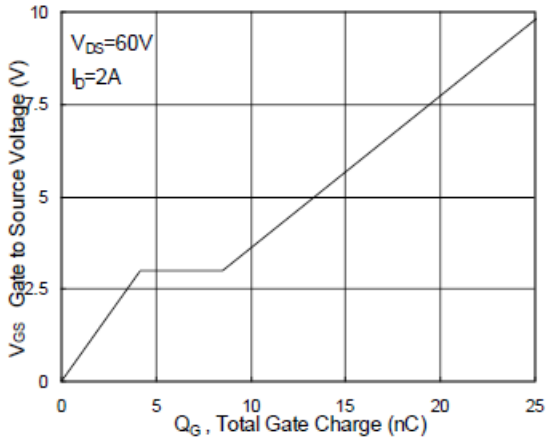


Fig.4 Gate-Charge Characteristics

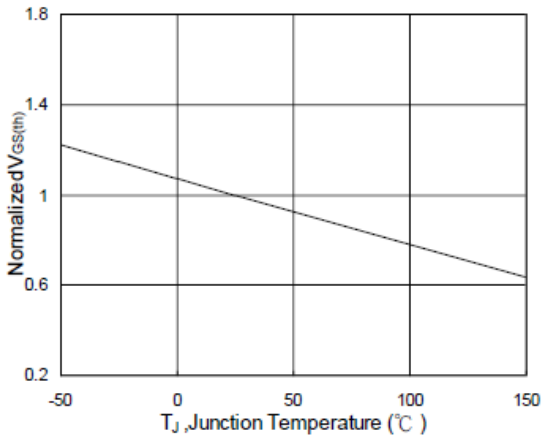


Fig.5 Normalized $V_{GS(th)}$ vs. TJ

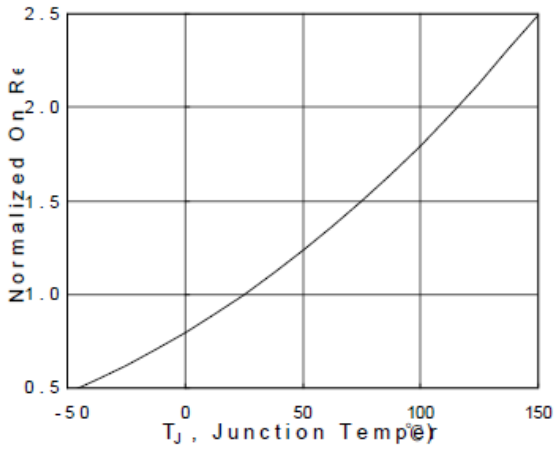


Fig.6 Normalized R_{DSON} vs. TJ

Typical Performance Characteristics (Continue)

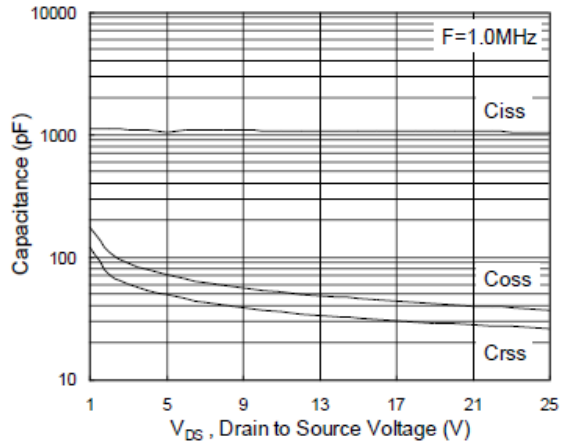


Fig.7 Capacitance

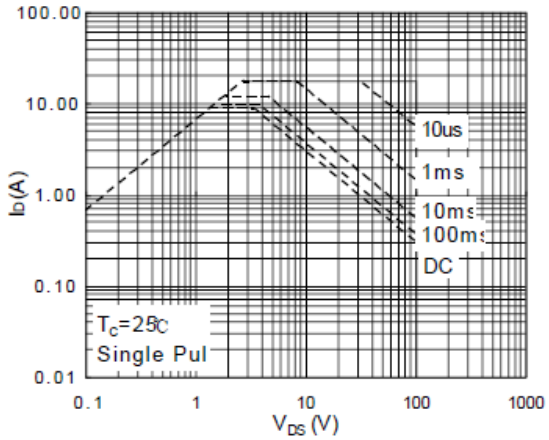


Fig.8 Safe Operating Area

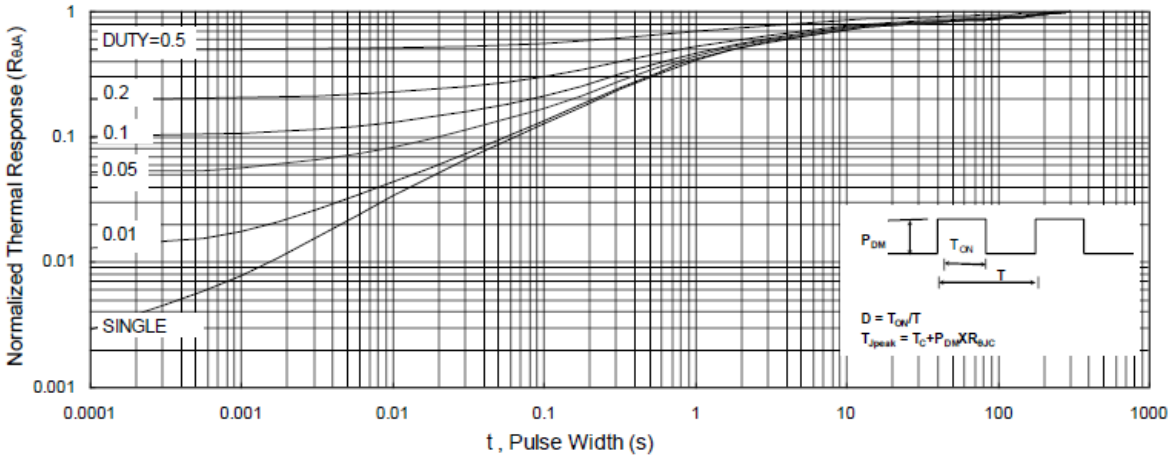


Fig.9 Normalized Maximum Transient Thermal Impedance

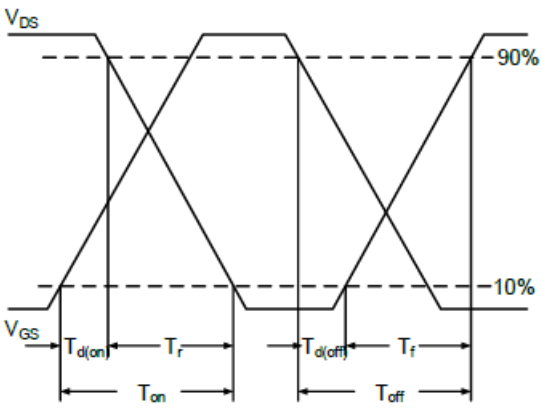


Fig.10 Switching Time Waveform

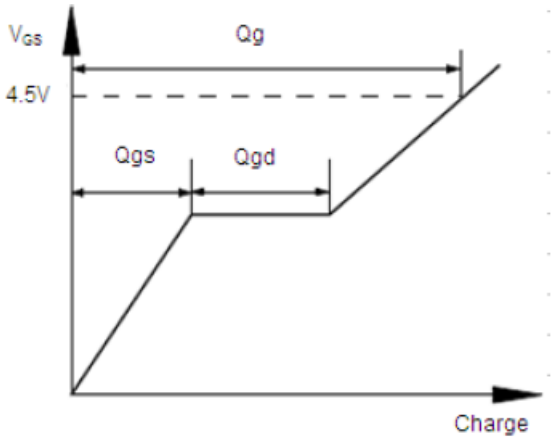
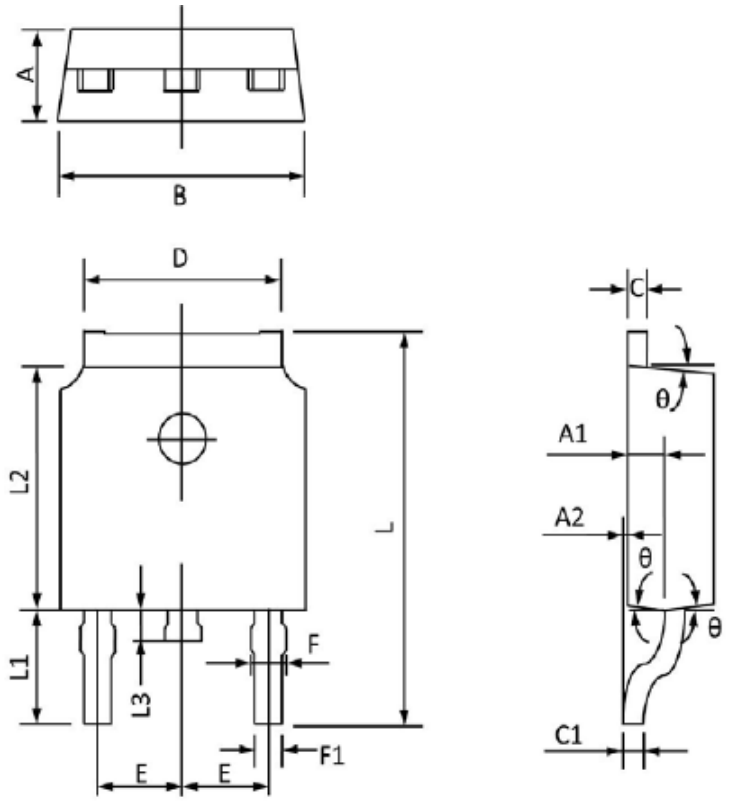


Fig.11 Gate Charge Wavefor

Package Dimension

TO-252-2L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	2.400	2.200	0.094	0.087
A1	1.110	0.910	0.044	0.036
A2	0.150	0.000	0.006	0.000
B	6.800	6.400	0.268	0.252
C	0.580	0.450	0.023	0.018
C1	0.580	0.460	0.023	0.018
D	5.500	5.100	0.217	0.201
E	2.386	2.186	0.094	0.086
F	0.940	0.600	0.037	0.024
F1	0.860	0.500	0.034	0.020
L	10.400	9.400	0.409	0.370
L1	3.000	2.400	0.118	0.094
L2	6.200	5.400	0.244	0.213
L3	1.200	0.600	0.047	0.024
θ	9°	3°	9°	3°

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CONTACT US

GS Headquarter	
	4F.,No.43-1,Lane11,Sec.6,Minquan E.Rd Neihu District Taipei City 114, Taiwan (R.O.C)
	886-2-2657-9980
	886-2-2657-3630
	sales_twn@gs-power.com

RD Division	
	824 Bolton Drive Milpitas. CA. 95035
	1-408-457-0587