

GSM4320DF

40V N-Channel MOSFET

Product Description

The N-Channel enhancement mode power field effect transistor is 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.

The device is well suited for high efficiency fast switching applications.

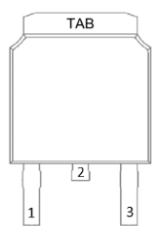
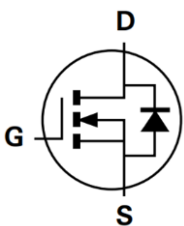
Features

- $R_{DS(ON)} = 2.4m\Omega @ V_{GS}=10V$
- $R_{DS(ON)} = 3.6m\Omega @ V_{GS}=4.5V$
- TO-252-2L Package
- RoHS Compliant and Halogen Free

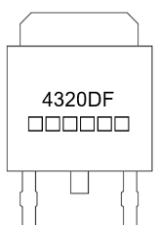
Applications

- MB / VGA / Vcore
- POL Applications
- SMPS

Packages & Pin Assignments

TO-252-2L			Equivalent Circuit		
					
Pin	Symbol	Description	Pin	Symbol	Description
1	G	Gate	2	D	Drain
3	S	Source	TAB	D	Drain

Ordering and Marking Information

Ordering Information			
Part Number	Package	Part Marking	Quantity / Reel
GSM4320DF	TO-252-2L	4320DF □□□□□□	2,500 PCS
GSM4320 1 2			
- Product Code: GSM4320		- Package Code: 1 is D for TO-252-2L	
		- Green Level: 2 is F for RoHS Compliant and Halogen Free	
Marking Information			
		- Product Code: 4320DF	
		- GS Code: □□□□□□	

Absolute Maximum Ratings (T_A = 25°C unless otherwise specified)

Symbol	Parameter	Value	Unit	
V _{DSS}	Drain-Source Voltage	40	V	
V _{GSS}	Gate-Source Voltage	±20	V	
I _D	Continuous Drain Current (Silicon Limited)	T _C =25°C	127	A
		T _C =100°C	80	
	Continuous Drain Current (Package Limited)		80	
I _{DM}	Pulsed Drain Current ¹	320	A	
I _{AS}	Single Pulse Avalanche Current, L = 0.1mH ¹	40	A	
E _{AS}	Single Pulse Avalanche Energy, L = 0.1mH ¹	213	mJ	
P _D	Power Dissipation	T _C =25°C	78	W
		T _C =100°C	31	
R _{θJC}	Thermal Resistance-Junction to Case	1.6	°C/W	
R _{θJA}	Thermal Resistance-Junction to Ambient ²	62	°C/W	
T _J	Operating Junction Temperature Range	-55 to +150	°C	
T _{STG}	Storage Temperature Range	-55 to +150	°C	

NOTE:

- Single pulse width is limited by max junction temperature.
- The device mounted on 1in² FR-4 board with 2oz. Copper

Electrical Characteristics (T_J = 25°C unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
B _V DSS	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	40	-	-	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =40V, V _{GS} =0V	-	-	1	μA
I _{GSS}	Gate-Source Leakage Current	V _{DS} =0V, V _{GS} =±20V	-	-	±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	1.2	-	2.5	V
R _{DS(ON)}	Drain-Source On-Resistance	V _{GS} =10V, I _D =20A	-	2	2.4	mΩ
		V _{GS} =4.5V, I _D =15A	-	2.8	3.6	
g _{fs}	Forward Transconductance	V _{DS} =5V, I _D =20A	-	42	-	S
Dynamic Characteristics						
R _g	Gate Resistance	f=1MHz		0.9		Ω
C _{iss}	Input Capacitance	V _{DS} =20V, V _{GS} =0V, f=1MHz	-	2950	-	pF
C _{oss}	Output Capacitance		-	980	-	
C _{rss}	Reverse Transfer Capacitance		-	78	-	
Q _g	Total Gate Charge	V _{DS} =20V, I _D =20A V _{GS} =10V	-	52	-	nC
Q _{gs}	Gate-Source Charge		-	8.3	-	
Q _{gd}	Gate-Drain Charge		-	14	-	
t _{d(on)}	Turn-On Delay Time	V _{DD} =20V, I _D =20A V _{GS} =10V, R _g =6Ω	-	10	-	ns
t _r	Turn-On Rise Time		-	15	-	
t _{d(off)}	Turn-Off Delay Time		-	20	-	
t _f	Turn-Off Fall Time		-	30	-	
Diode Characteristics						
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =1A	-	-	1	V
t _{rr}	Reverse Recovery Time	I _F =10A, dI/dt=100A/μs	-	70	-	ns
Q _{rr}	Reverse Recovery Charge		-	100	-	nC

Typical Performance Characteristics

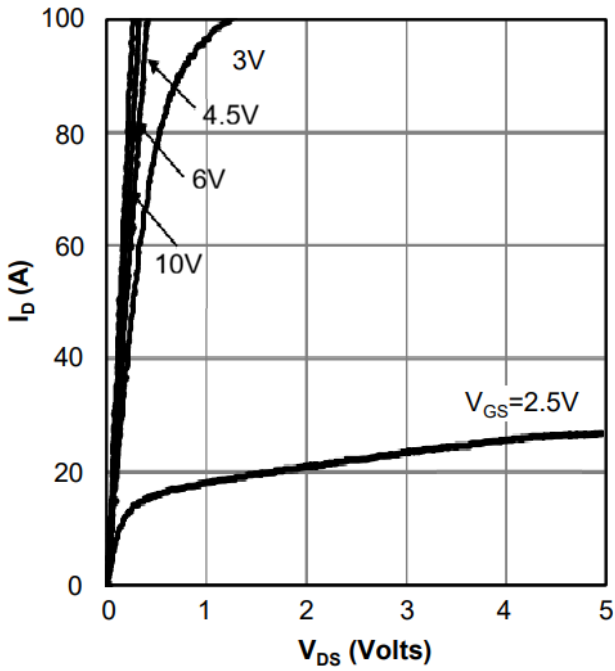


FIG.1 Output Characteristics

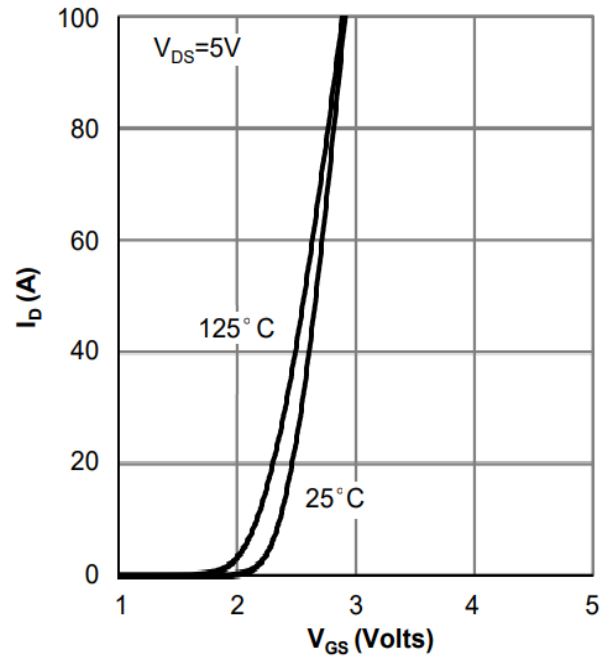


FIG.2 Transfer Characteristics

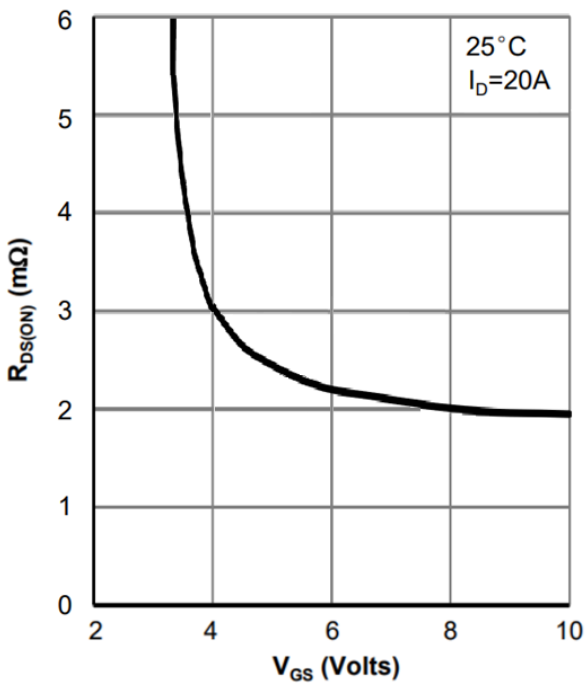


FIG.3 On-Resistance vs. Gate Voltage

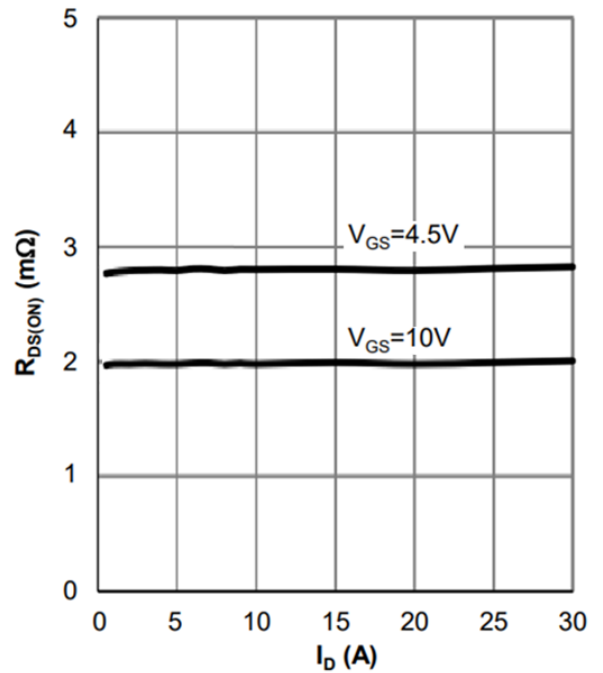


FIG.4 On-Resistance vs. Drain Current

Typical Performance Characteristics

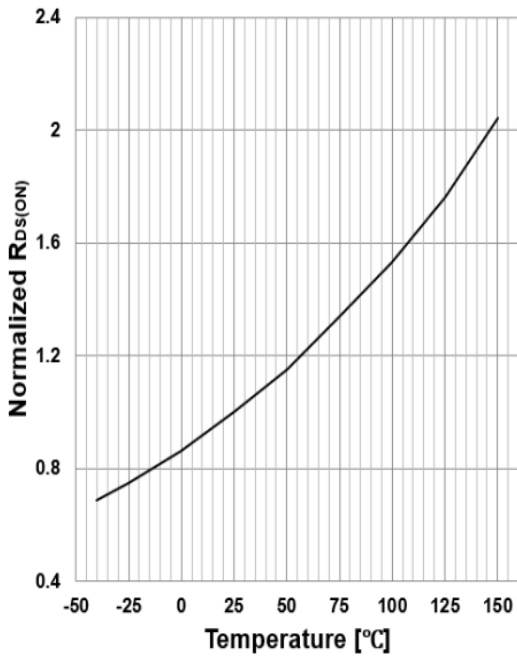


FIG.5 Normalized On-Resistance vs. T_J

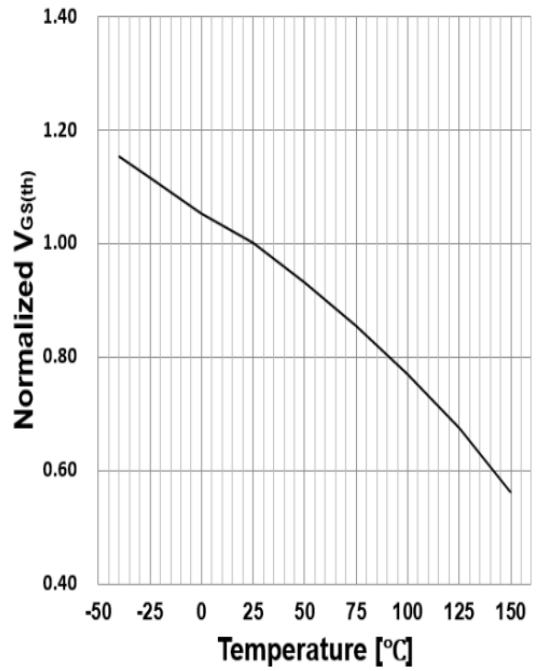


FIG.6 Normalized $V_{GS(th)}$ vs. T_J

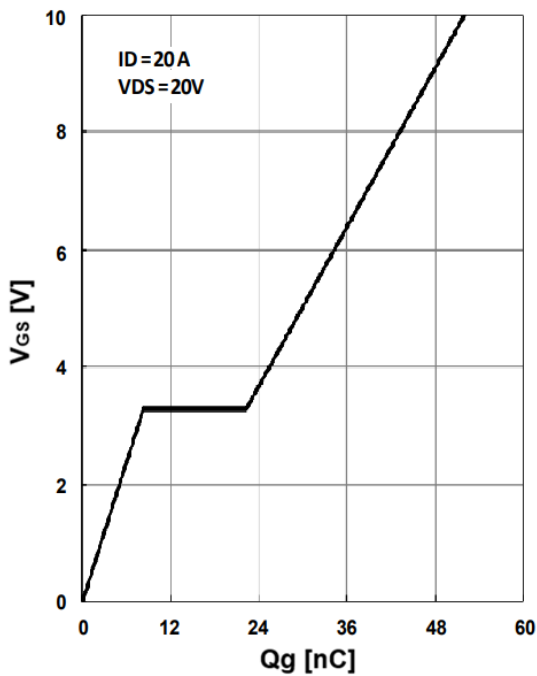


FIG.7 Gate Charge Characteristics

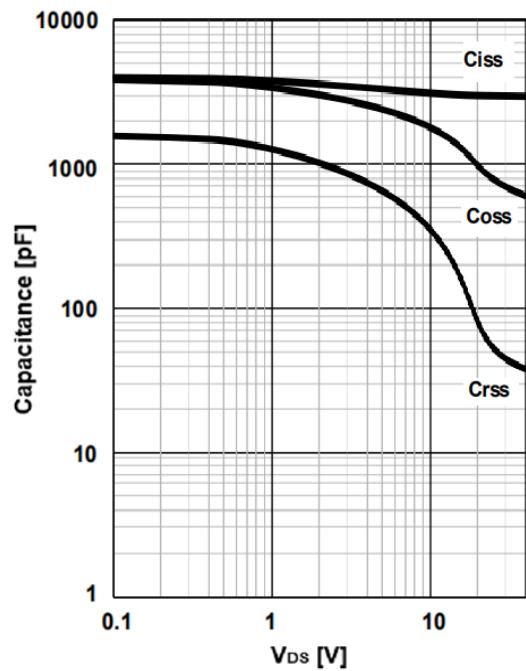


FIG.8 Capacitance Characteristics

Typical Performance Characteristics

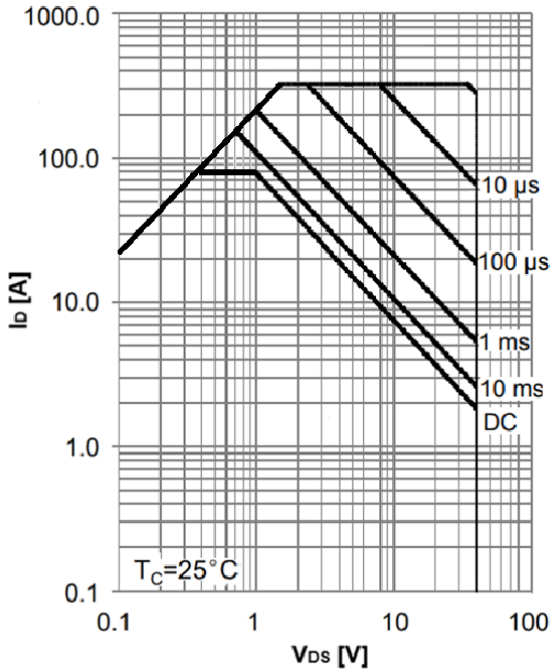


FIG.9 Maximum Safe Operation Area

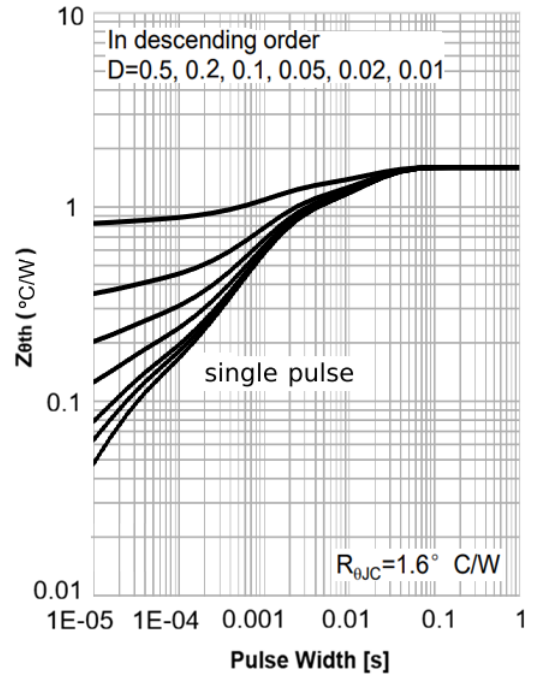


FIG.10 Transient Thermal Impedance

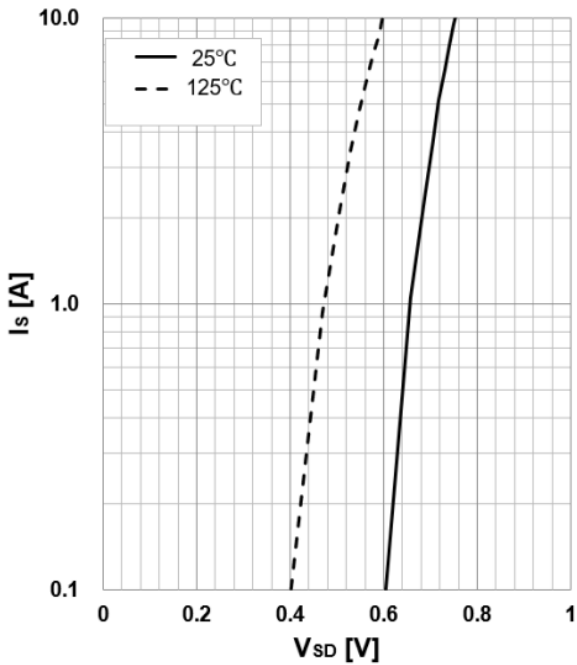
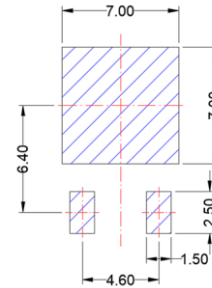
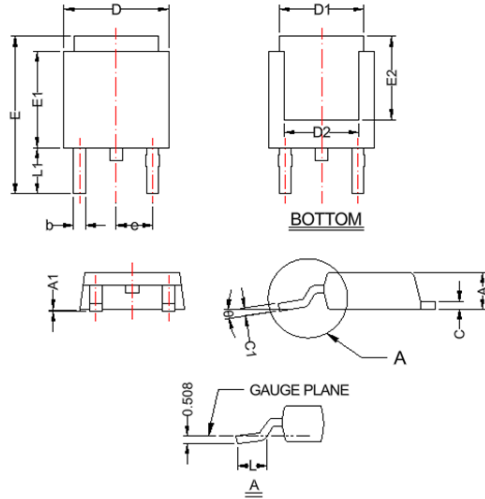


FIG.11 Body-Diode Characteristics

TO-252-2L(AA)

Package Dimension (2)

Recommended Land Pattern



Unit:mm

Dimensions (1)				
Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	2.18	2.40	0.086	0.094
A1	0.00	0.15	0.000	0.006
b	0.64	0.90	0.025	0.035
c	0.40	0.89	0.016	0.035
c1	0.40	0.61	0.016	0.024
D	6.35	6.73	0.250	0.265
D1	4.95	5.46	0.195	0.215
D2	4.32	---	0.170	---
E	9.40	10.41	0.370	0.410
E1	5.97	6.22	0.235	0.245
E2	4.95	---	0.195	---
e	2.286 BSC		0.090 BSC	
L	1.40	1.77	0.055	0.070
L1	2.67	3.07	0.105	0.121
θ	0°	8°	0°	8°

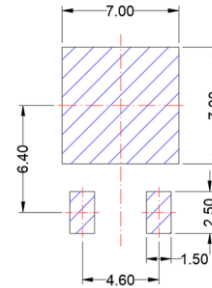
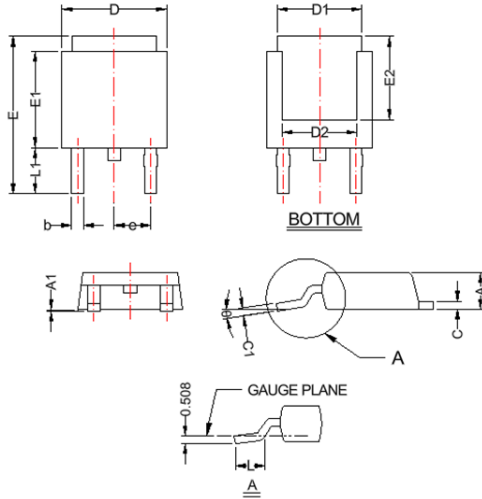
NOTE:

- Dimensions are exclusive of Burrs, Mold Flash and Tie Bar extrusions.
- The drawing is used to express the dimension while the actual appearance may vary

TO-252-2L(AB)

Package Dimension (2)

Recommended Land Pattern



Unit:mm

Dimensions (1)				
Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	2.18	2.40	0.086	0.094
A1	0.00	0.15	0.000	0.006
b	0.50	0.90	0.020	0.035
c	0.45	0.89	0.018	0.035
c1	0.40	0.61	0.016	0.024
D	6.35	6.80	0.250	0.268
D1	4.95	5.50	0.195	0.217
D2	3.81	---	0.150	---
E	9.40	10.41	0.370	0.410
E1	5.33	5.80	0.210	0.228
E2	4.57	---	0.180	---
e	2.286 BSC		0.090 BSC	
L	1.40	1.78	0.055	0.070
L1	2.40	3.00	0.094	0.118
θ	0°	8°	0°	8°





NOTE:



- 1 Dimensions are exclusive of Burrs, Mold Flash and Tie Bar extrusions.
- 2 The drawing is used to express the dimension while the actual appearance may vary

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