GLOBALTECH SEMICONDUCTOR

GSM9105

20V P-Channel Enhancement Mode MOSFET

Product Description

The GSM9105 is the P-Channel logic enhancement mode power field effect transistors are produced using high cell density, DMOS trench technology.
This high density process is especially tailored to minimize on-state resistance.
These devices are particularly suited for low voltage application such as cellular phone and notebook computer power management and other battery powered circuits where high-side switching , and low in-line power loss are needed in a very small outline surface mount package.

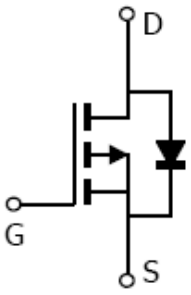
Features

- -20V/-3.4A,$R_{DS(ON)}$= 95mΩ@V_{GS}=-4.5V
- -20V/-2.4A,$R_{DS(ON)}$=120mΩ@V_{GS}=-2.5V
- -20V/-1.7A,$R_{DS(ON)}$=145mΩ@V_{GS}=-1.8V
- -20V/-1.0A,$R_{DS(ON)}$=210mΩ@V_{GS}=-1.25V
- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- SOT-23-3L package design

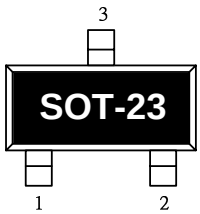
Applications

- Power Management in Note book
- Portable Equipment
- Battery Powered System
- DC/DC Converter
- Load Switch
- DSC
- LCD Display inverter

Block Diagram



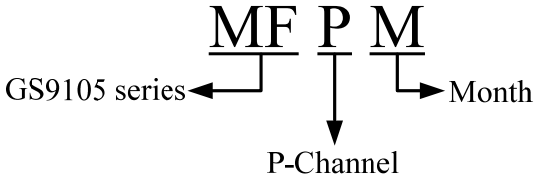
Packages & Pin Assignments



Pin1 = GATE
Pin2 = SOUR
Pin3 = DRAIN

Ordering Information

P/N	Marking
GSM9105ZF	13YW
	MFPM



M=Month (ref “Data Mode info)

Absolute Maximum Ratings

(TA=25℃ Unless otherwise noted)

Parameter		Symbol	Typical	Unit
Drain-Source Voltage		V_{DSS}	-20	V
Gate –Source Voltage		V_{GSS}	±12	V
Continuous Drain Current(T_J=150℃)	T_A=25℃	I_D	-3.4	A
	T_A=70℃		-2.4	
Pulsed Drain Current		I_{DM}	-8	A
Continuous Source Current(Diode Conduction)		I_S	-1.4	A
Power Dissipation	T_A=25℃	PD	1.25	W
	T_A=70℃		0.8	
Operating Junction Temperature		T_J	-55/150	℃
Storage Temperature Range		T_{STG}	-55/150	℃
Thermal Resistance-Junction to Ambient		$R_{\theta JA}$	105	℃/W

Electrical Characteristics

(TA=25℃ Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V,I_D= -250uA	-20			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D= -250uA	-0.35		-0.8	
Gate Leakage Current	I_{GSS}	V_{DS}=0V,V_{GS}=±12V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}= -20V,V_{GS}=0V			-1	uA
		V_{DS}= -20V,V_{GS}=0V T_J=55℃			-5	
On-State Drain Current	$I_{D(on)}$	V_{DS}≦ -5V,V_{GS}= -4.5V	-6			A
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}= -4.5V,I_D= -3.4A		0.076	0.095	Ω
		V_{GS}= -2.5V,I_D= -2.4A		0.097	0.120	
		V_{GS}= -1.8V,I_D= -1.7A		0.123	0.145	
		V_{GS}= -1.25V,I_D= -1.0A		0.185	0.210	
Forward Transconductance	g_{fs}	V_{DS}= -5V,I_D= -2.8A		6		S
Diode Forward Voltage	V_{SD}	I_S= -1.5A,V_{GS}=0V		-0.8	-1.2	V
Dynamic						
Total Gate Charge	Q_g	V_{DS}= -6V,V_{GS}= -4.5 I_D≡ -2.8A		4.8	8	nC
Gate-Source Charge	Q_{gs}			1.0		
Gate-Drain Charge	Q_{gd}			1.0		
Input Capacitance	C_{iss}	V_{DS}= -6V,V_{GS}=0V f=1MHz		485		pF
Output Capacitance	C_{oss}			85		
Reverse Transfer Capacitance	C_{rss}			40		
Turn-On Time	$t_{d(on)}$	V_{DD}= -6V,R_L=6Ω I_D≡ -1.0A,V_{GEN}= -4.5 R_G=6Ω		10	16	ns
	t_r			13	23	
Turn-Off Time	$t_{d(off)}$			18	25	
	t_f			15	20	

Typical Performance Characteristics

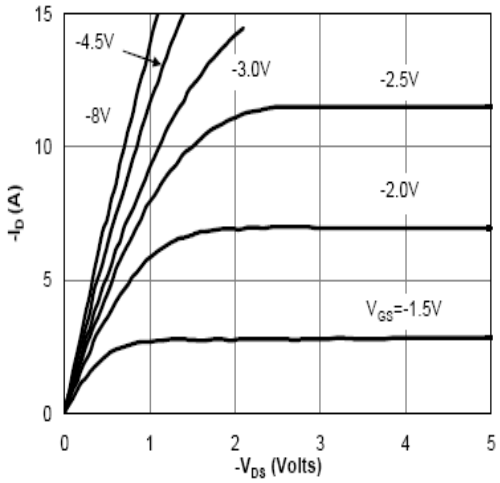


Fig 1: On-Region Characteristics

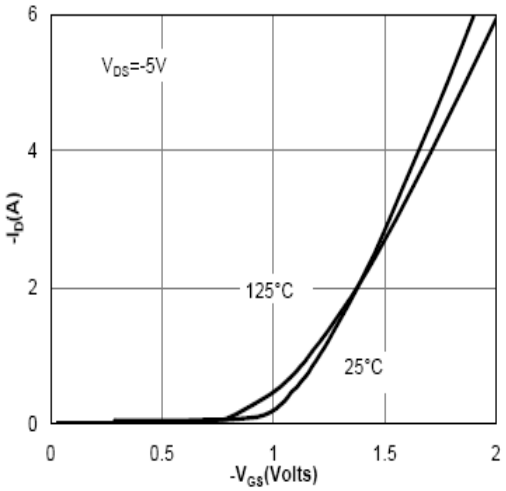


Figure 2: Transfer Characteristics

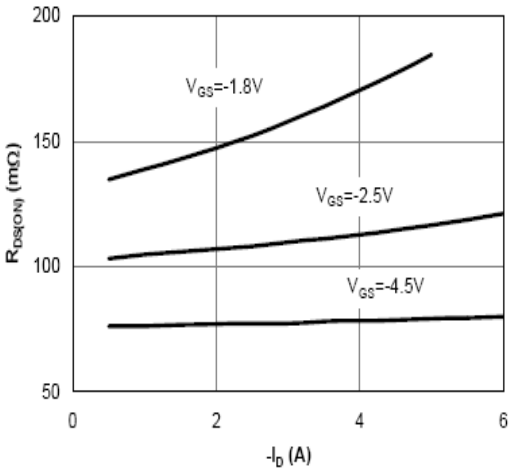


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

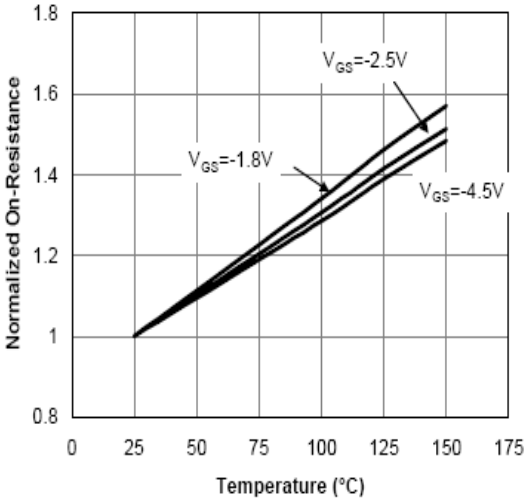


Figure 4: On-Resistance vs. Junction Temperature

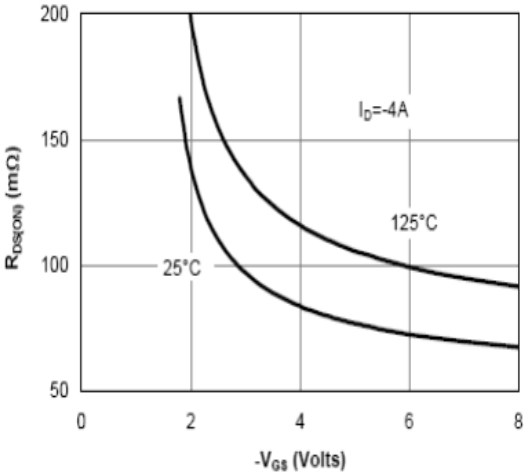


Figure 5: On-Resistance vs. Gate-Source Voltage

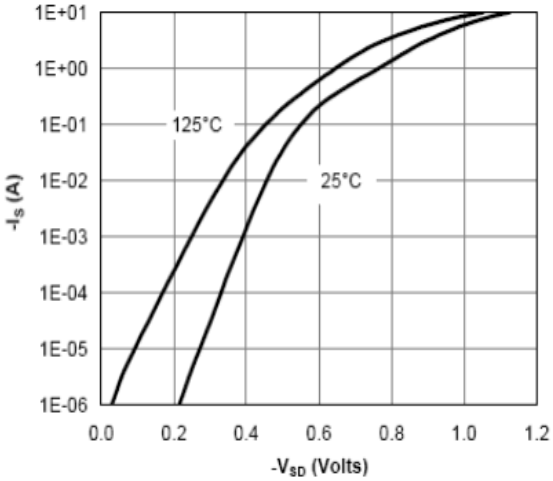


Figure 6: Body-Diode Characteristics

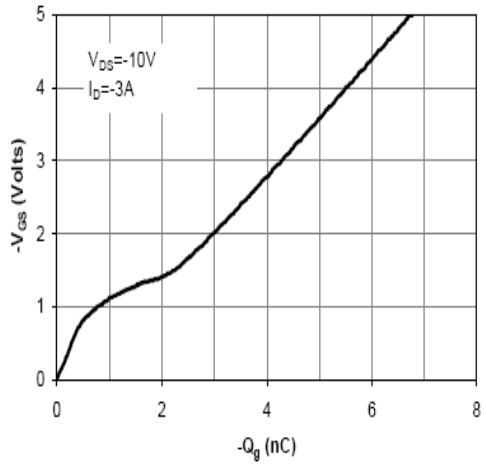


Figure 7: Gate-Charge Characteristics

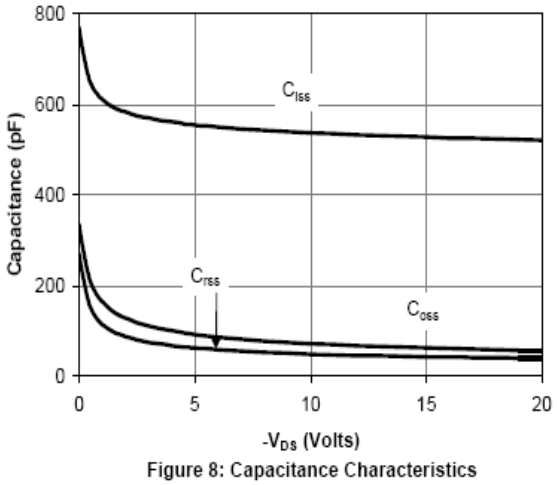


Figure 8: Capacitance Characteristics

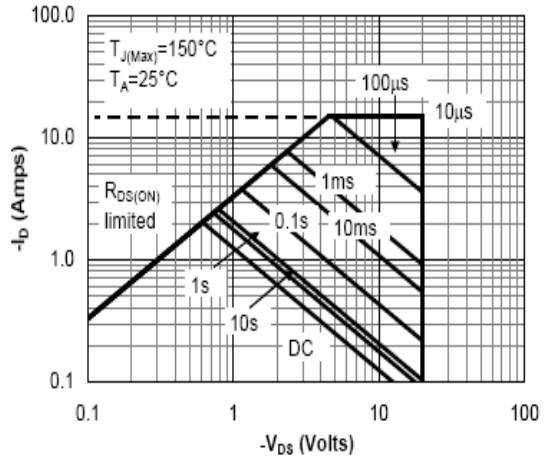


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

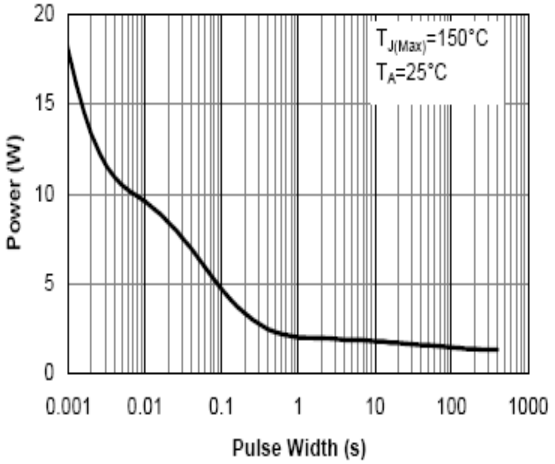


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

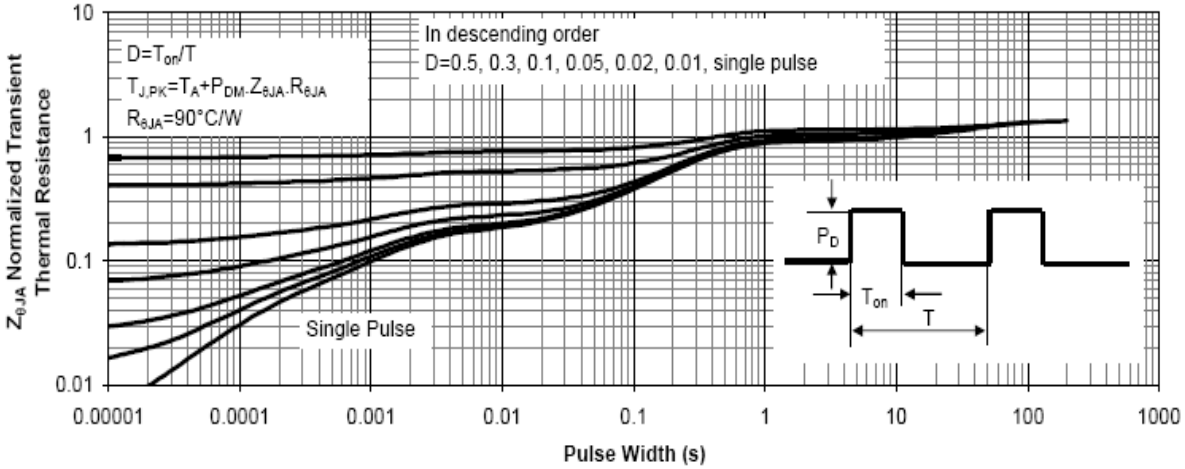
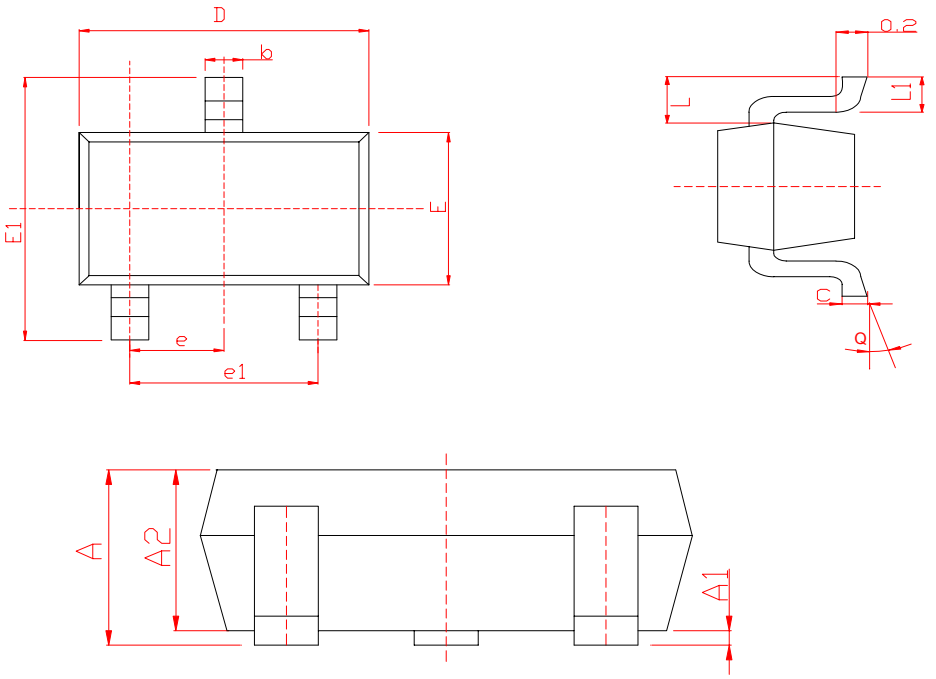


Figure 11: Normalized Maximum Transient Thermal Impedance

Package Dimension

SOT-23-3



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.05	1.25	0.041	0.049
A1	0	0.1	0	0.004
A2	1.05	1.15	0.041	0.045
b	0.3	0.4	0.012	0.016
c	0.1	0.2	0.004	0.008
D	2.82	3.02	0.111	0.119
E	1.5	1.7	0.059	0.067
E1	2.65	2.95	0.104	0.116
e	0.950 (TYP)		0.037 (TYP)	
e1	1.8	2	0.071	0.079
L	0.700 (TYP)		0.028 (TYP)	
L1	0.3	0.6	0.012	0.024
Q	0°	8°	0°	8°

NOTICE

Information furnished is believed to be accurate and reliable. However Globaltech Semiconductor assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties, which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of Globaltech Semiconductor. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information without express written approval of Globaltech Semiconductor.

(Revise Date:2008/1/15 Version_1.2)