GSM3415ZF

20V P-Channel Enhancement Mode MOSFET

Product Description

GSM3415ZF, P-Channel enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent $R_{DS(ON)}$, low gate charge.

The device is particularly suited for low Voltage power management, such as smart Phone and notebook computer and other battery powered circuits, and low in-line power loss are needed in commercial industrial surface mount applications.

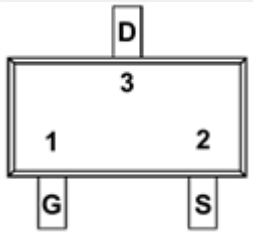
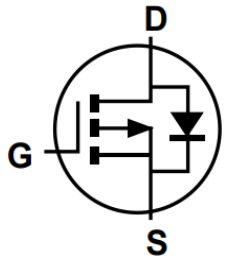
Features

- $R_{DS(ON)}$ = 45mΩ@V_{GS} = -4.5V
- $R_{DS(ON)}$ = 58mΩ@V_{GS} = -2.5V
- $R_{DS(ON)}$ = 85mΩ@V_{GS} = -1.8V
- Super high-density cell design for extremely low $R_{DS\ (ON)}$
- Exceptional on-resistance and maximum DC current capability
- SOT-23 package design

Applications

- Portable Equipment
- Battery Powered System
- Net Working System

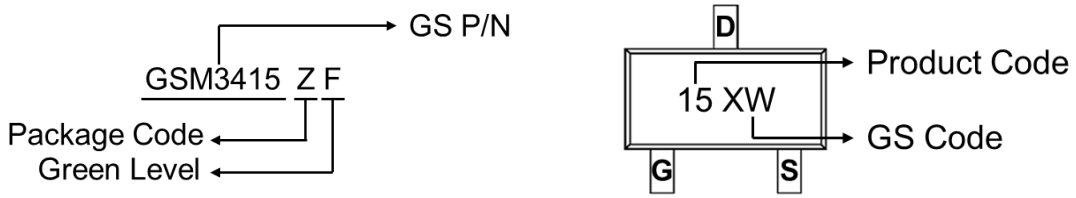
Package & Pin Assignments

GSM3415ZF (SOT-23)	Equivalent Circuit
	

Pin	Description
1	Gate
2	Source
3	Drain

Ordering and Marking Information

Part Number	Package	Part Marking	Quantity / Reel
GSM3415ZF	SOT-23	15□□	3,000 PCS



- Package Code
  Z : SOT-23
- Green Level
  F : RoHS and Halogen Free

Absolute Maximum Ratings

T_A=25ºC, unless otherwise specified

Symbol	Parameter		Value	Unit
V_{DSS}	Drain-Source Voltage		-20	V
V_{GSS}	Gate-Source Voltage		±12	V
I_D	Continuous Drain Current	T_A =25ºC	-4.9	A
		T_A =70ºC	-3.9	
I_{DM}	Pulsed Drain Current		-10	A
I_S	Continuous Body Diode Forward Current		-1.6	A
P_D	Total Power Dissipation	T_A =25ºC	1.56	W
		T_A =70ºC	1.0	
T_J	Operating Junction Temperature		+150	ºC
T_{STG}	Storage Temperature Range		-55 to +150	ºC
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient		80	ºC/W

Electrical Characteristics

T_A=25ºC, unless otherwise specified

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Static characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=-250μA	-20	-	-	V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=-250μA	-0.4	-	-0.9	
I_{GSS}	Gate-Source Leakage Current	V_{DS}=0V, V_{GS}=±12V	-	-	±100	nA
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=-16V, V_{GS}=0V	-	-	-1.0	μA
		V_{DS}=-16V, V_{GS}=0V T_J=85ºC	-	-	-10	
$R_{DS(ON)}$	Drain-Source On-Resistance	V_{GS} = -4.5V, I_D=-4.9A	-	40	45	mΩ
		V_{GS} =-2.5V, I_D=-3.4A	-	50	58	
		V_{GS} =-1.8V, I_D=-2.2A	-	60	85	
g_{FS}	Forward Transconductance	V_{DS}=-5V, I_D=-3.6A	-	10	-	S
V_{SD}	Diode Forward Voltage	I_S=-1.6A, V_{GS}=0V	-	-0.85	-1.2	V
Dynamic characteristics						
Q_g	Total Gate Charge	V_{DS}=-10V, V_{GS}=-2.5V, I_D=-4.0A	-	10	18	nC
Q_{gs}	Gate-Source Charge		-	2.5	-	
Q_{gd}	Gate-Drain Charge		-	3.5	-	
C_{iss}	Input Capacitance	V_{DS}=-10V, V_{GS}=0V, f=1MHz	-	1050	-	pF
C_{oss}	Output Capacitance		-	165	-	
C_{rss}	Reverse Transfer Capacitance		-	135	-	
$t_{d(on)}$	Turn-On Delay Time	V_{DD}=-10V, V_{GS}=-4.5V, I_D=-3.7A, R_L=2.7Ω, R_G=1Ω	-	15	25	ns
t_r	Turn-On Rise Time		-	25	40	
$t_{d(off)}$	Turn-Off Delay Time		-	40	65	
t_f	Turn-Off Fall Time		-	15	25	

Typical Performance Characteristics

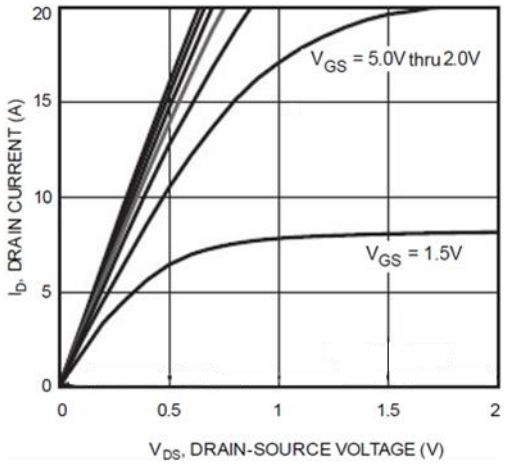


Fig. 1 Typical Output Characteristics

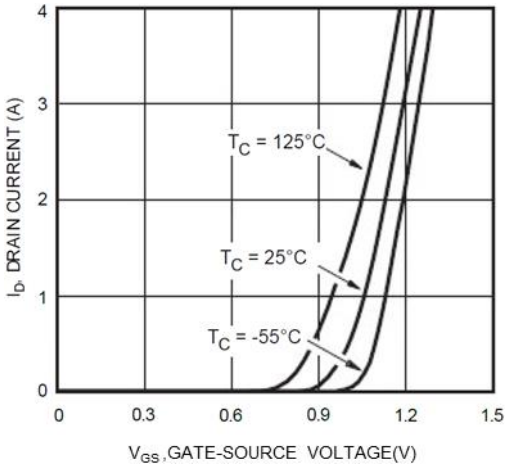


Fig. 2 Typical Transfer Characteristics

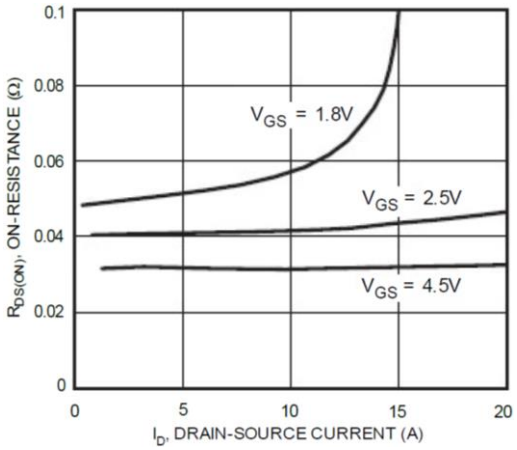


Fig. 3 On-Resistance vs. Drain Current

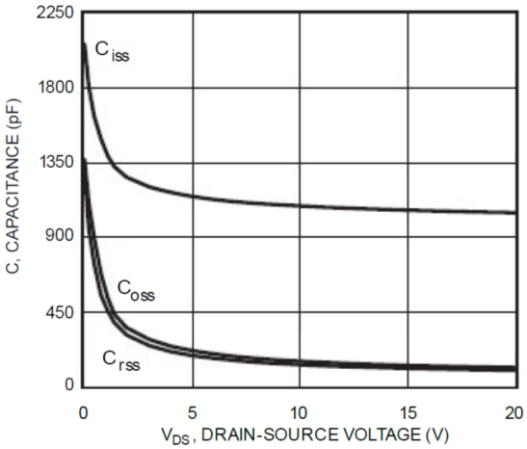


Fig. 4 Capacitance vs. Drain-Source Voltage

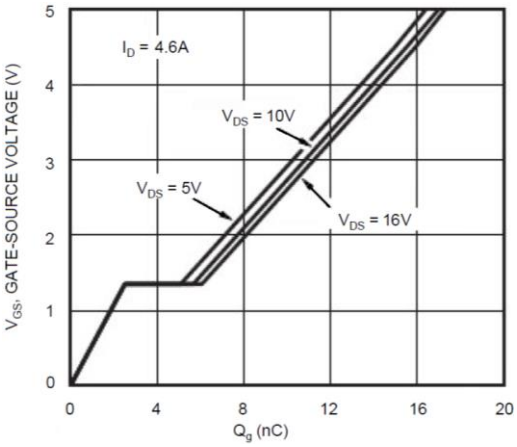


Fig. 5 Gate Charge

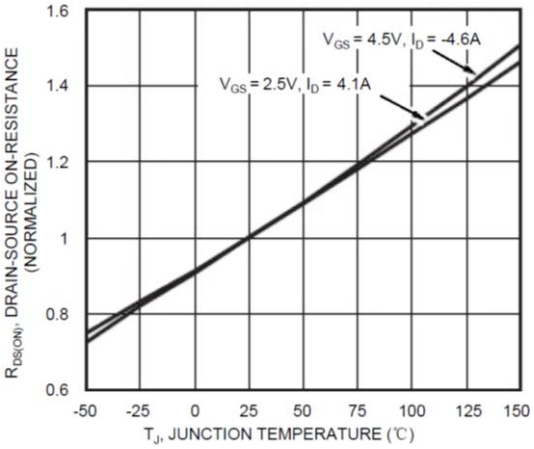


Fig. 6 On-Resistance vs. Junction Temperature

Typical Performance Characteristics

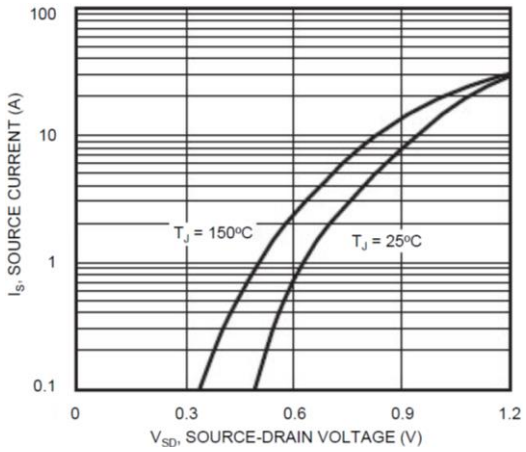


Fig. 7 Source-Drain Forward Voltage

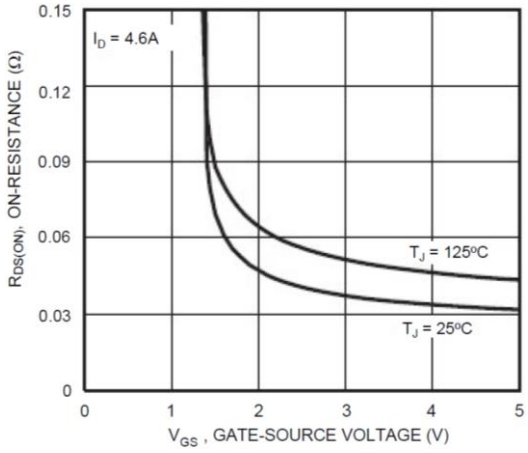


Fig. 8 On-Resistance vs. Gate-Source Voltage

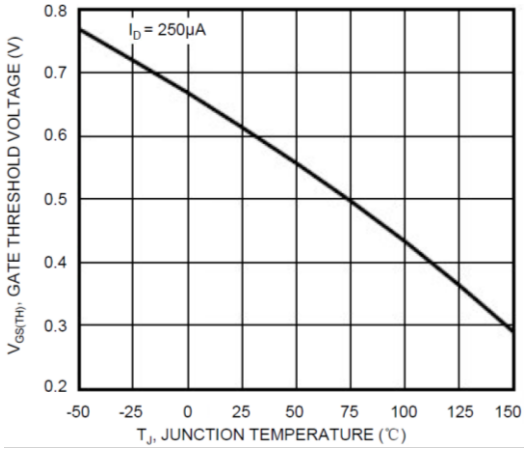


Fig. 9 Gate Threshold Voltage vs. Junction Temperature

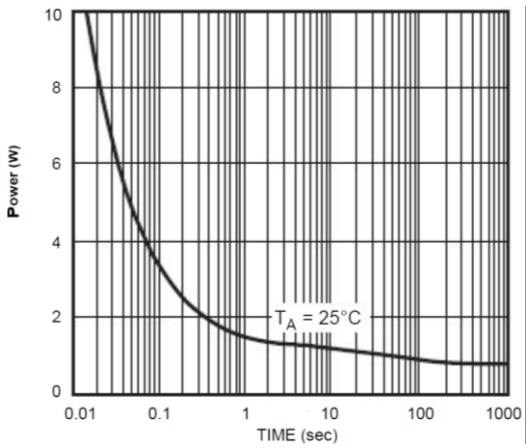


Figure. 10 Single Pulse Power

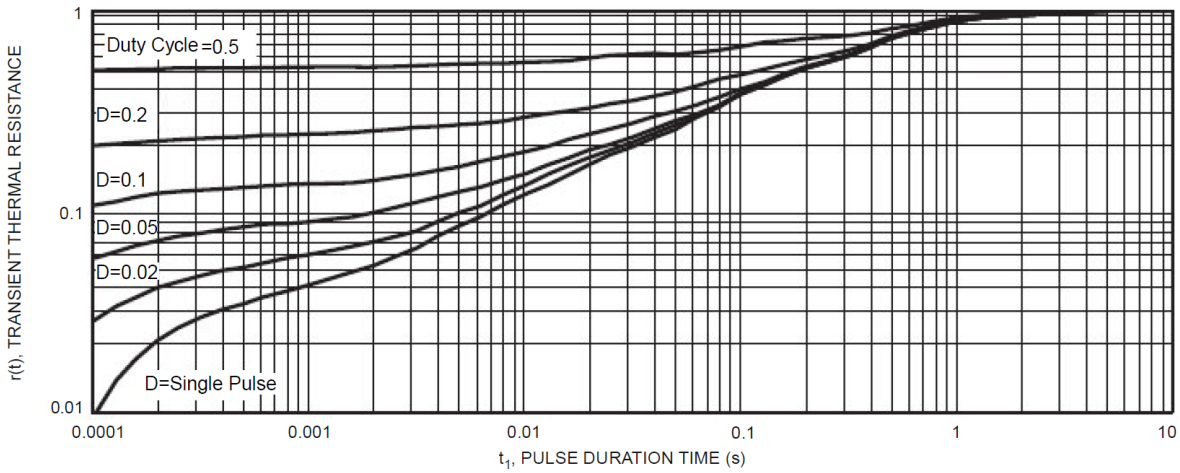
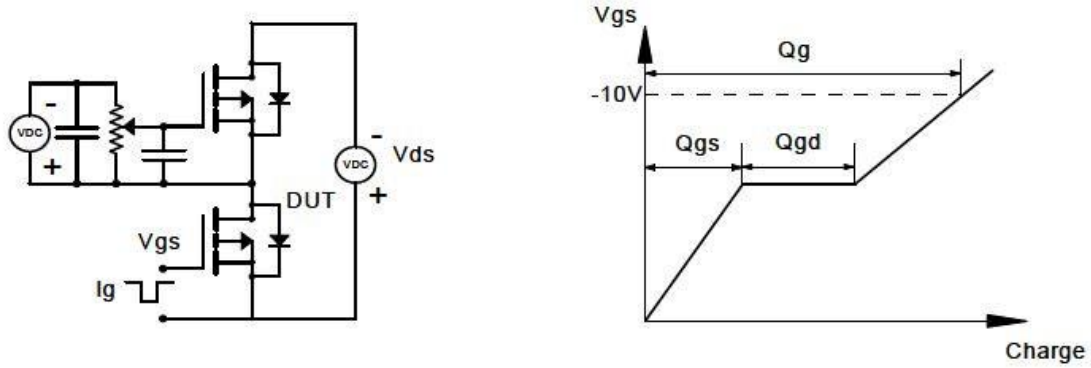


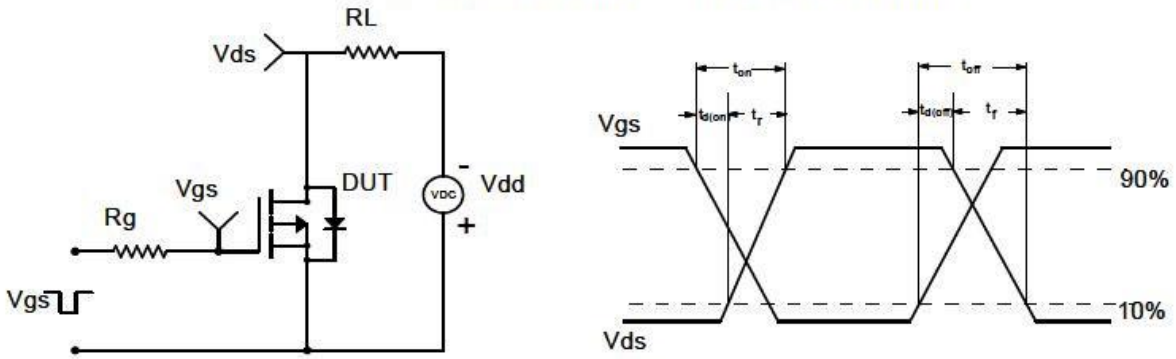
Fig. 11 Normalized Thermal Transient Impedance

Test Circuits and Waveforms

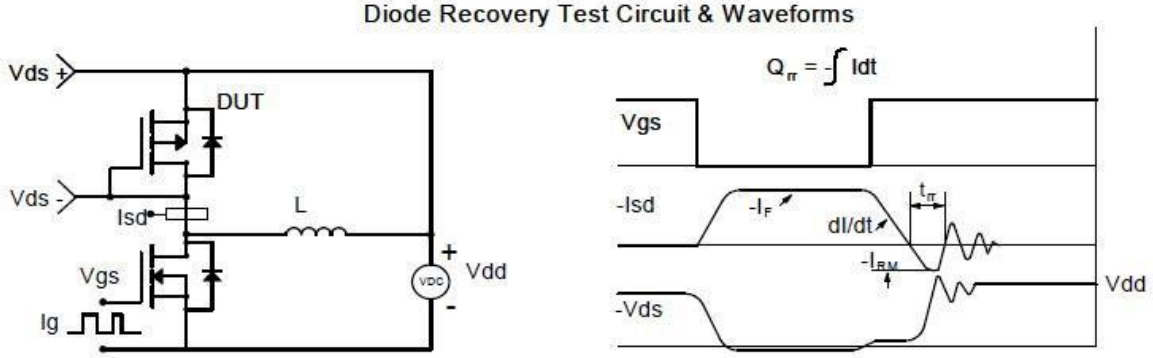
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

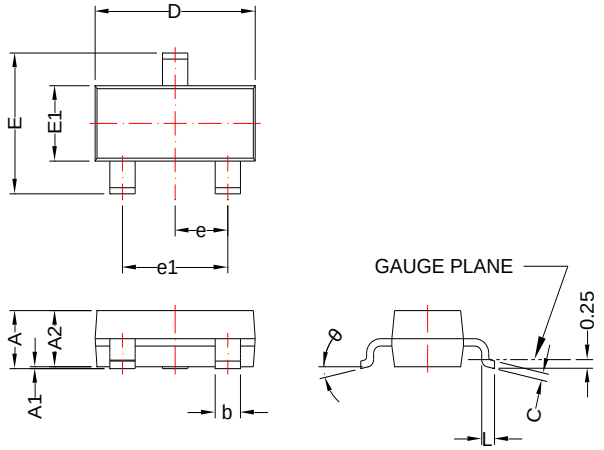


Diode Recovery Test Circuit & Waveforms

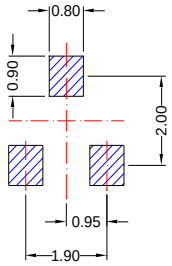


SOT-23

Package Dimension



Recommended Land Pattern



Dimensions				
Symbol	Millimeters		Inches	
	MIN	MAX	MIN	MAX
A	0.75	1.17	0.030	0.046
A1	0.01	0.15	0.000	0.006
A2	0.70	1.02	0.028	0.040
b	0.30	0.50	0.012	0.020
c	0.08	0.20	0.003	0.008
D	2.80	3.04	0.110	0.120
E	2.10	2.64	0.083	0.104
E1	1.20	1.40	0.047	0.055
e	0.95 BSC		0.037 BSC	
e1	1.90 BSC		0.075 BSC	
L	0.3	0.6	0.012	0.024
θ	0°	8°	0°	8°

NOTE:

DIMENSION D DOES NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS. MOLD FLASH, PROTRUSIONS OR GATE BURRS SHALL NOT EXCEED 0.25mm PER END. DIMENSION E1 DOES NOT INCLUDE INTERLEAD FLASH OR PROTRUSION. INTERLEAD FLASH OR PROTRUSION SHALL NOT EXCEED 0.25mm PER SIDE.

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