

GSM3415

20V P-Channel Enhancement Mode MOSFET

Product Description

GSM3415, P-Channel enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent $R_{DS(ON)}$, low gate charge.

These devices are 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.

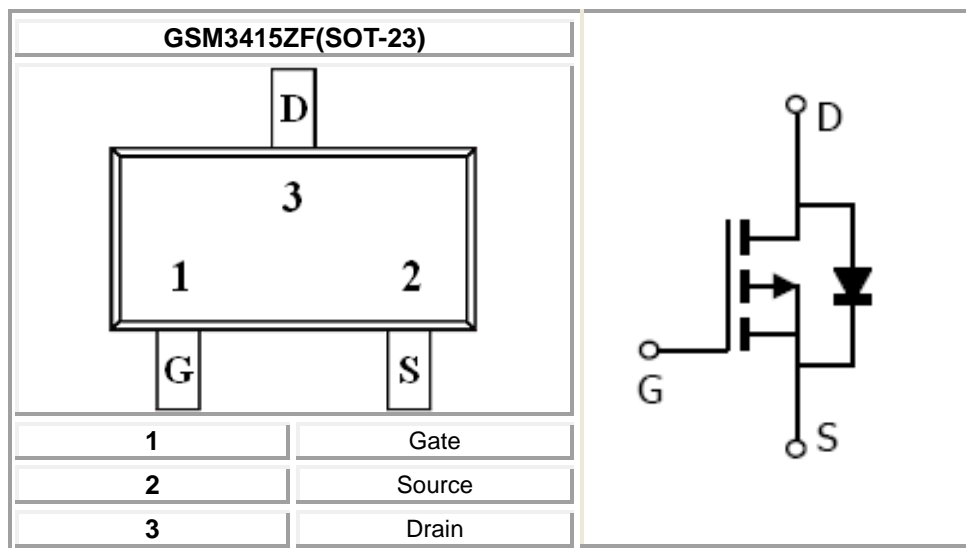
Features

- -20V/-4.9A, $R_{DS(ON)}=45m\Omega@V_{GS}=-4.5V$
- -20V/-3.4A, $R_{DS(ON)}=58m\Omega@V_{GS}=-2.5V$
- -20V/-2.2A, $R_{DS(ON)}=85m\Omega@V_{GS}=-1.8V$
- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability

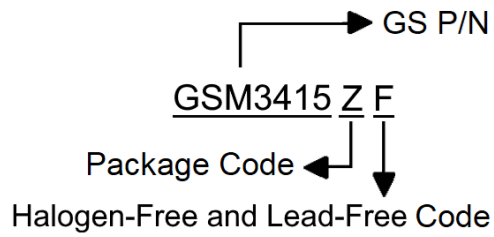
Applications

- Portable Equipment
- Battery Powered System
- Net Working System

Packages & Pin Assignments

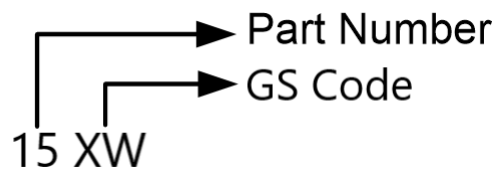


Ordering Information



Part Number	Package	Quantity Reel
GSM3415ZF	SOT-23	3000 PCS

Marking Information



Absolute Maximum Ratings

($T_A=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Typical	Unit	
V_{DSS}	Drain-Source Voltage	-20	V	
V_{GSS}	Gate –Source Voltage	± 12	V	
I_D	Continuous Drain Current($T_J=150^\circ\text{C}$)	$T_C=25^\circ\text{C}$	-4.9	A
		$T_C=70^\circ\text{C}$	-3.9	
I_{DM}	Pulsed Drain Current	-10	A	
I_S	Continuous Source Current(Diode Conduction)	-1.6	A	
P_D	Power Dissipation	$T_C=25^\circ\text{C}$	1.56	W
T_J	Operating Junction Temperature	150	$^\circ\text{C}$	
T_{STG}	Storage Temperature Range	-55/150	$^\circ\text{C}$	
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	120	$^\circ\text{C}/\text{W}$	

Electrical Characteristics

(T_A=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250uA	-20			V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250uA	-0.4		-0.9	V
I _{GSS}	Gate Leakage Current	V _{DS} =0V, V _{GS} =±12V			±100	nA
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-16V, V _{GS} =0V			-1	uA
		V _{DS} =-16V, V _{GS} =0V T _J =85°C			-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						
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 Time	V _{DD} =-10V, R _L =2.7Ω, I _D =-3.7A, V _{GEN} =-4.5V, R _G =1Ω		15	25	ns
t _r				25	40	
t _{d(off)}	Turn-Off Time			40	65	
t _f				15	25	

Typical Performance Characteristics

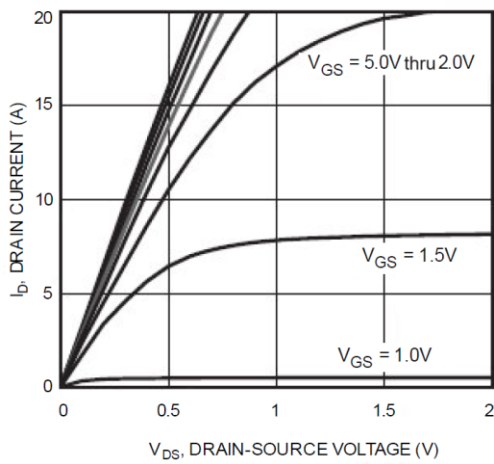


Fig. 1 Typical Output Characteristics

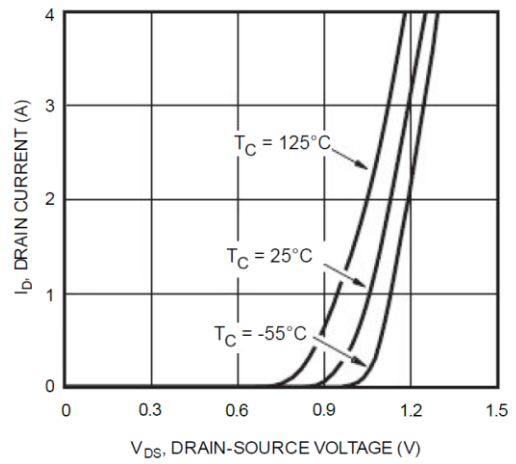


Fig. 2 Typical Transfer Characteristics

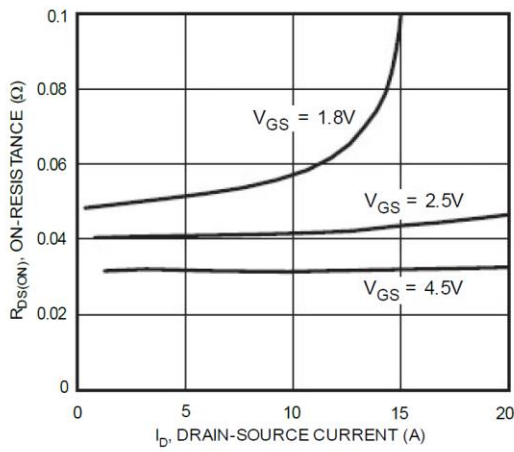


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

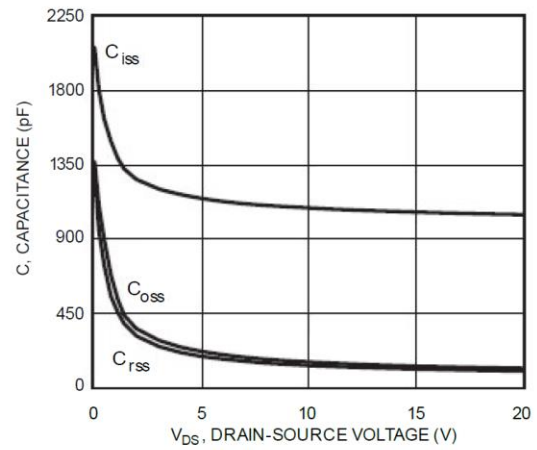


Fig. 4 Typical Capacitance

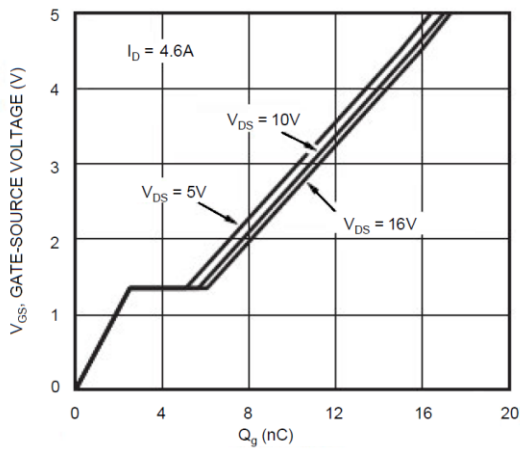


Fig. 5 Gate Charge

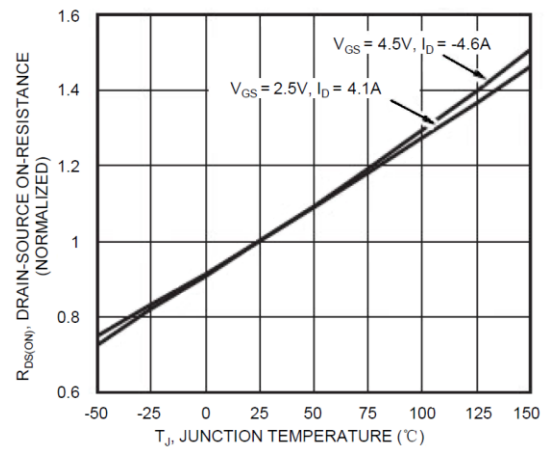


Fig. 6 On-Resistance Variation with Temperature

Typical Performance Characteristics (continue)

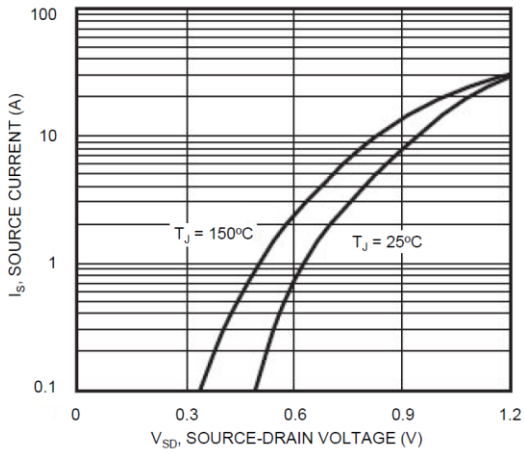


Fig. 7 Source-Drain Forward Voltage

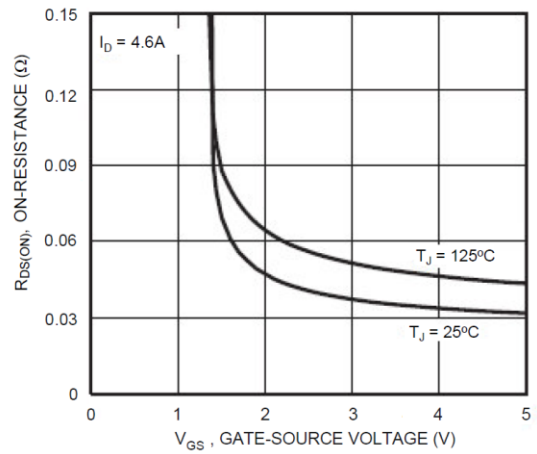


Fig. 8 On-Resistance vs. Gate-Source Voltage

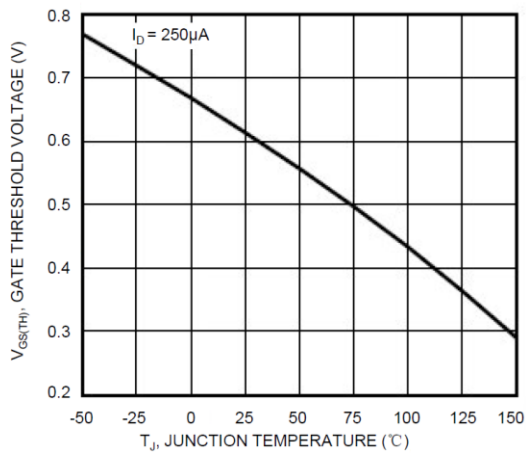


Fig. 9 Gate Threshold Variation vs. T_J

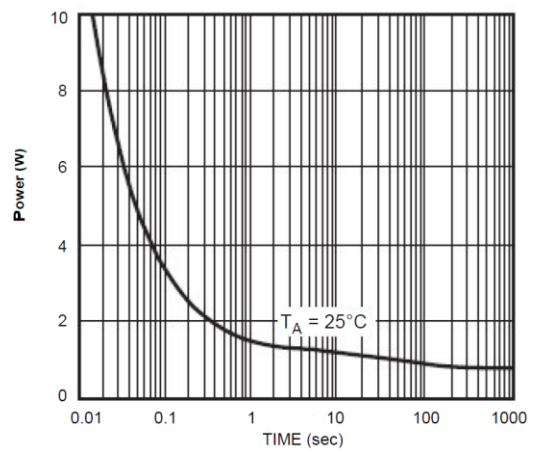


Figure. 10 Single Pulse Power

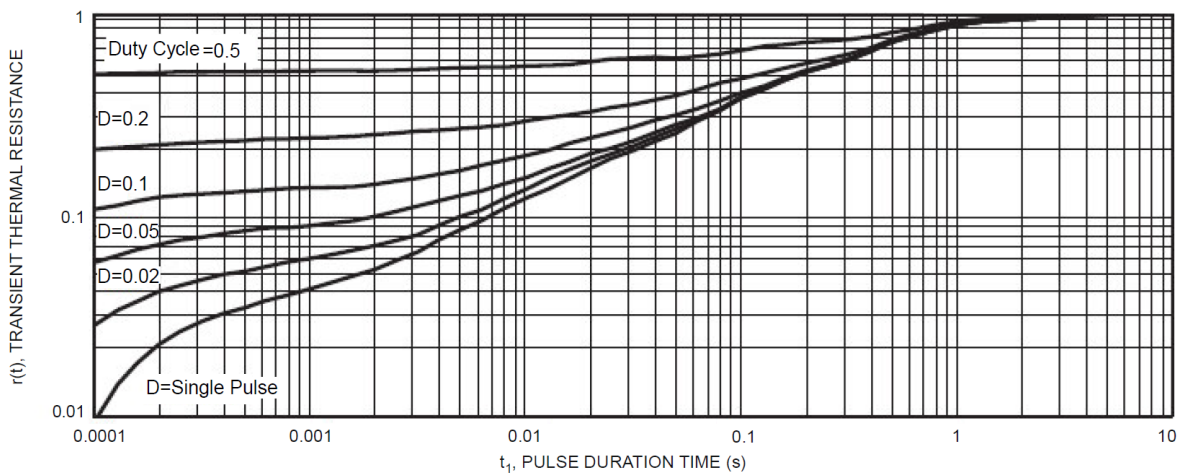
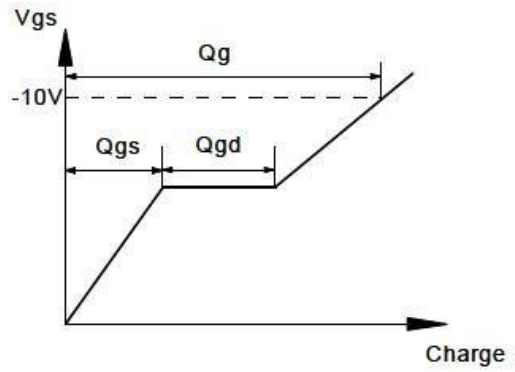
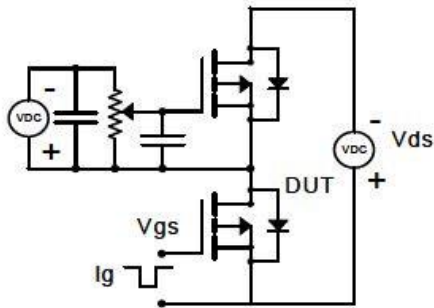


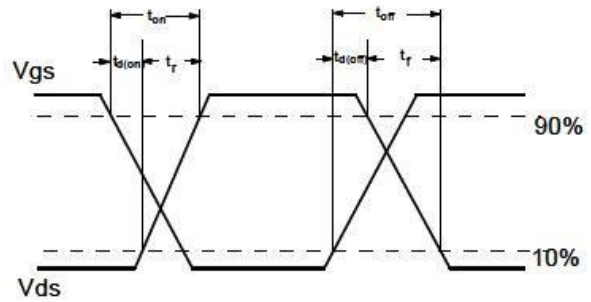
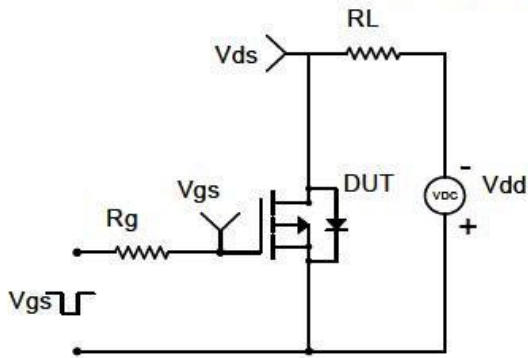
Fig. 10 Normalized Thermal Transient Impedance

Typical Performance Characteristics (continue)

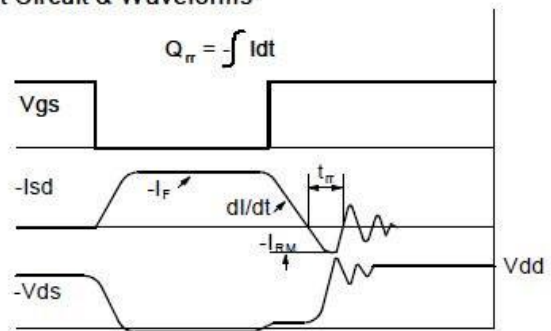
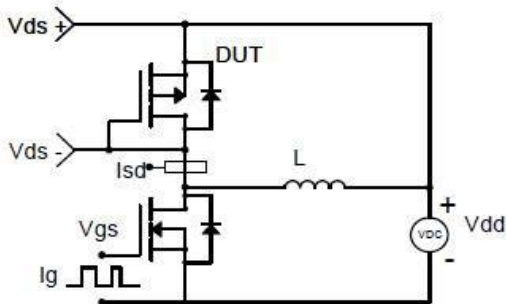
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

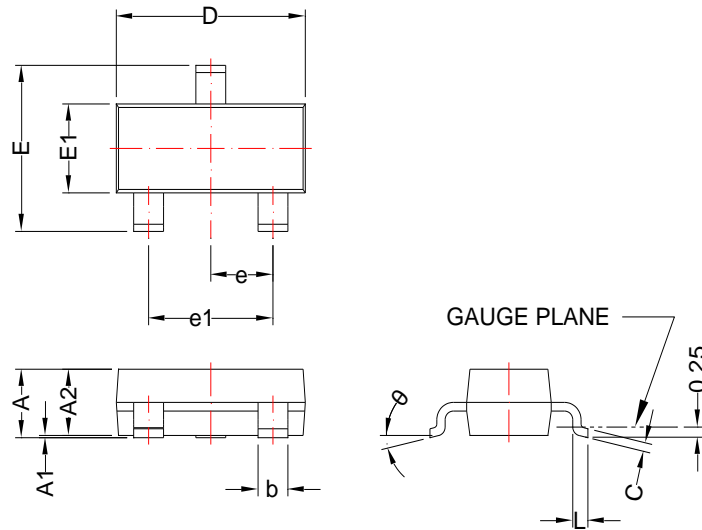


Diode Recovery Test Circuit & Waveforms



Package Dimension

SOT-23



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

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°





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