

# 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.

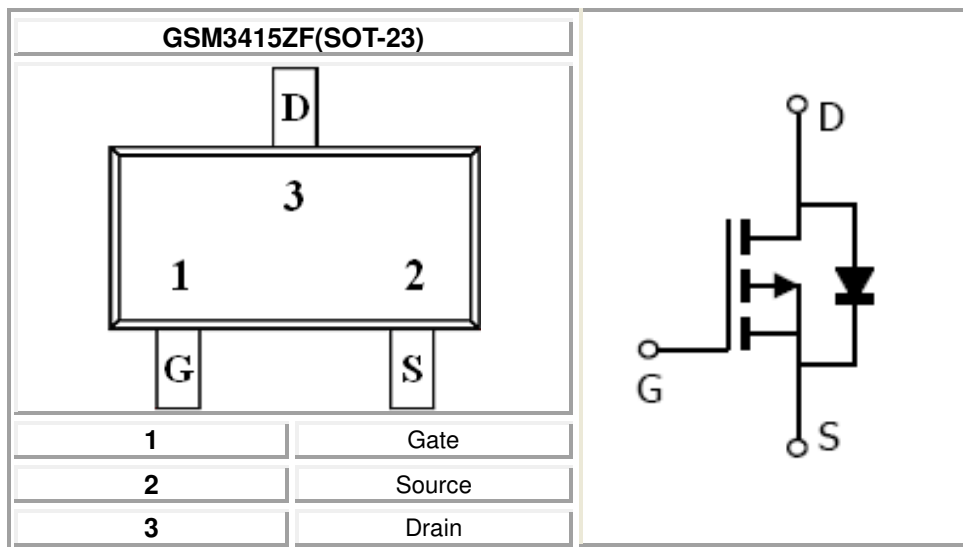
### Features

- -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

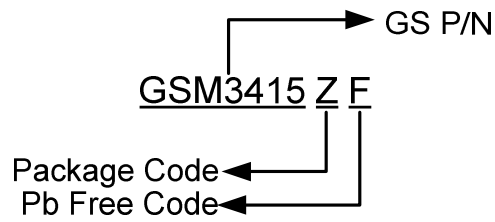
### Applications

- Portable Equipment
- Battery Powered System
- Net Working System

### Packages & Pin Assignments

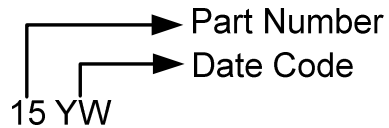


## Ordering Information



Part Number	Package	Quantity Reel
GSM3415ZF	SOT-23	3000 PCS

## Marking Information



## Absolute Maximum Ratings

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

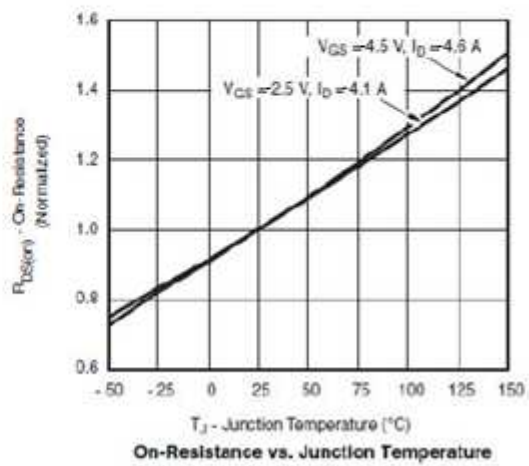
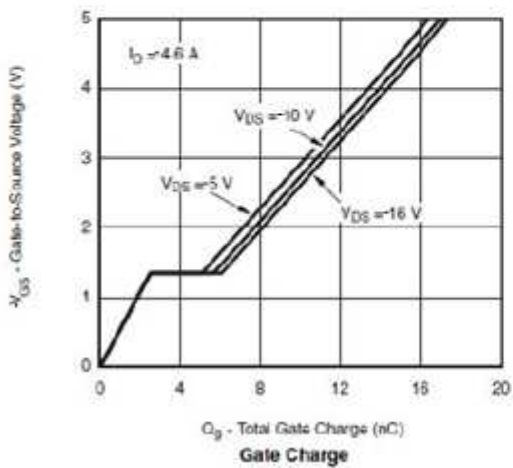
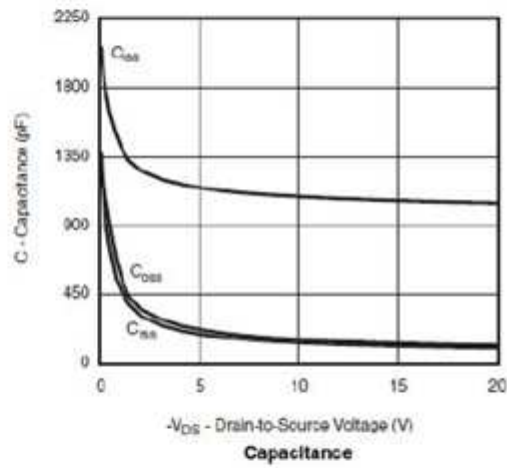
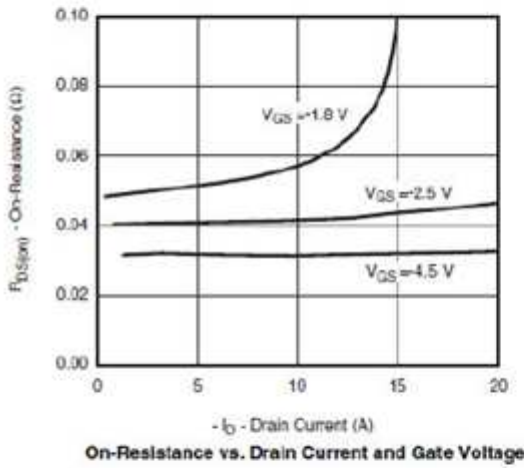
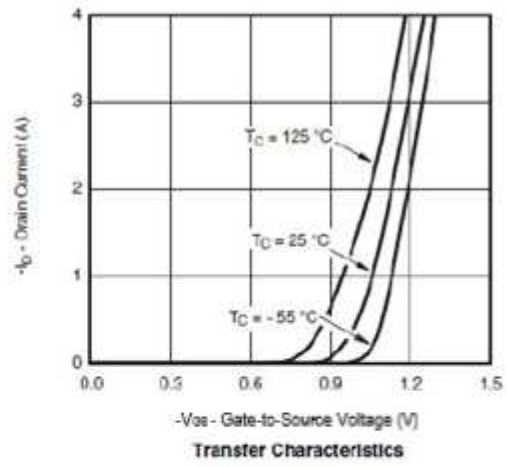
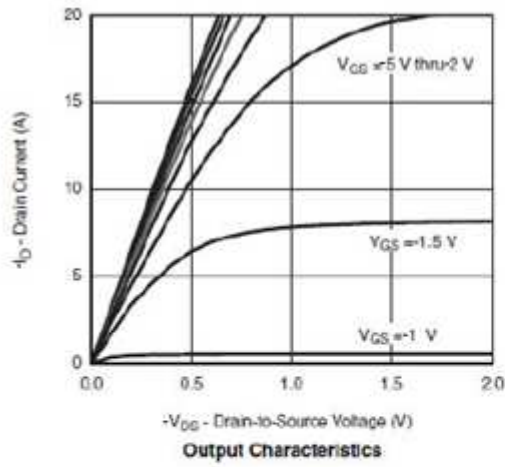
Symbol	Parameter	Typical	Unit	
$V_{DS}$	Drain-Source Voltage	-20	V	
$V_{GS}$	Gate -Source Voltage	$\pm 12$	V	
$I_D$	Continuous Drain Current( $T_J=150^{\circ}\text{C}$ )	$T_C=25^{\circ}\text{C}$	-4.9	A
		$T_C=70^{\circ}\text{C}$	-3.9	
$I_{DM}$	Pulsed Drain Current	-10	A	
$I_S$	Continuous Source Current(Diode 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

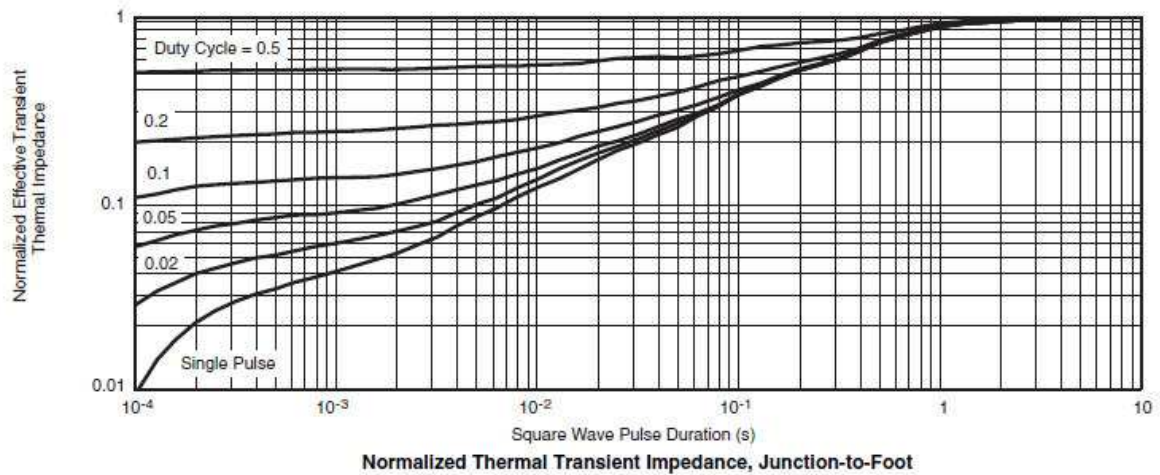
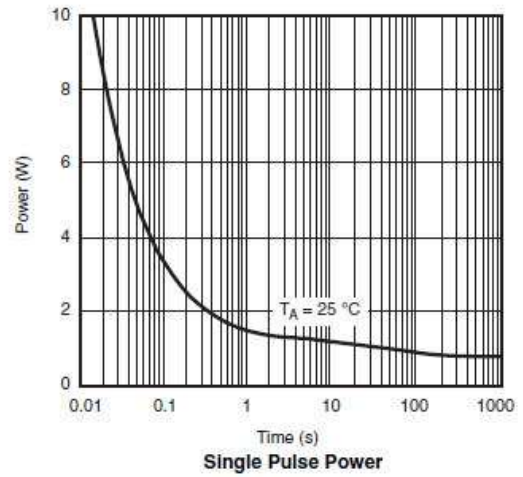
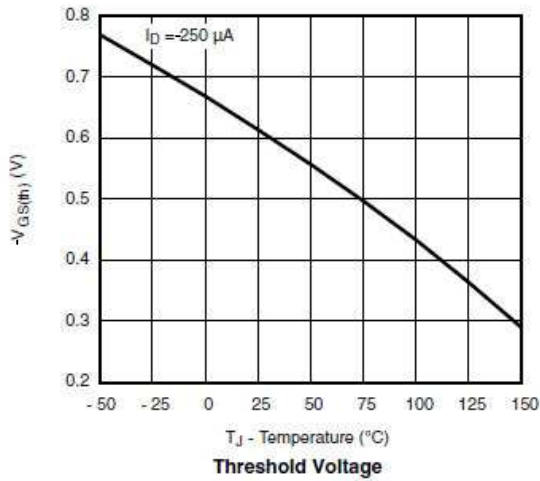
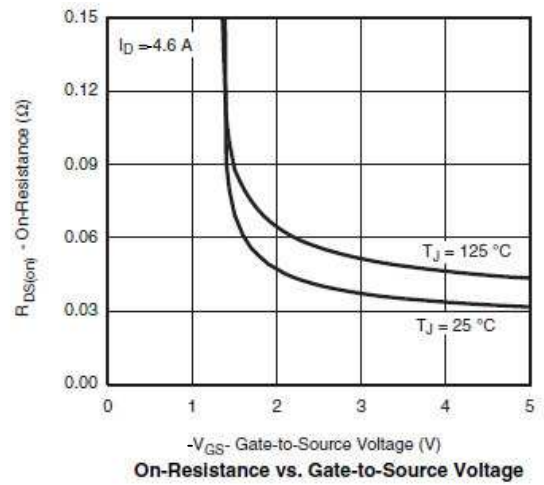
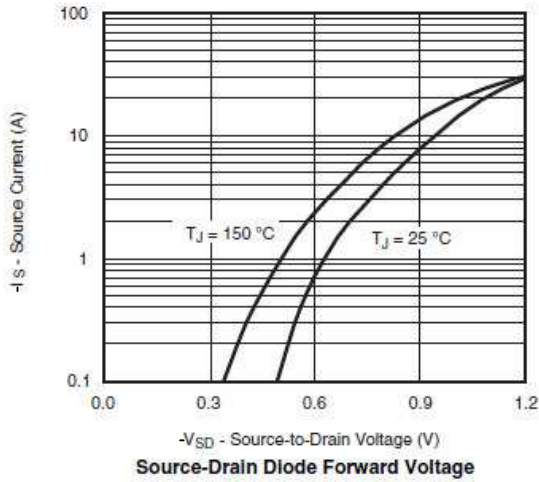
( $T_A=25^\circ\text{C}$  unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Static</b>						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-20			V
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.4		-0.9	V
$I_{GSS}$	Gate Leakage Current	$V_{DS}=0V, V_{GS}=\pm 12V$			$\pm 100$	nA
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=-16V, V_{GS}=0V$			-1	uA
		$V_{DS}=-16V, V_{GS}=0V$ $T_J=85^\circ\text{C}$			-10	
$R_{DS(on)}$	Drain-Source On-Resistance	$V_{GS} = -4.5V, I_D=-4.9A$		40	45	m $\Omega$
		$V_{GS} = -2.5V, I_D=-3.4A$		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
<b>Dynamic</b>						
$Q_g$	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	$V_{DS}=-10V, V_{GS}=0V,$ $f=1\text{MHz}$		1050		pF
$C_{oss}$	Output Capacitance			165		
$C_{rss}$	Reverse Transfer Capacitance			135		
$t_{d(on)}$	Turn-On Time	$V_{DD}=-10V, R_L=2.7\Omega,$ $I_D=-3.7A, V_{GEN}=-4.5V,$ $R_G=1\Omega$		15	25	ns
$t_r$				25	40	
$t_{d(off)}$	Turn-Off Time			40	65	
$t_f$				15	25	

## Typical Performance Characteristics

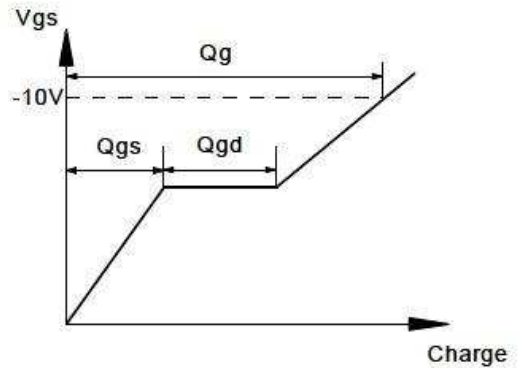
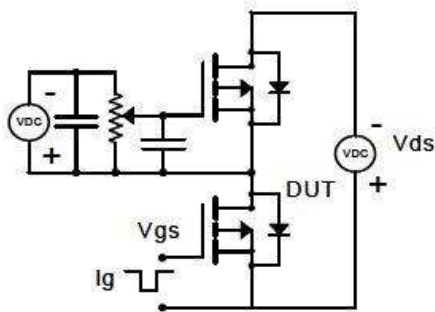


## Typical Performance Characteristics (continue)

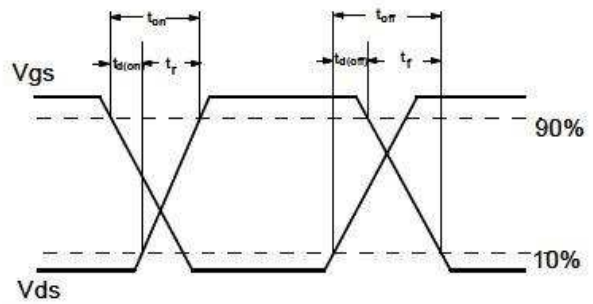
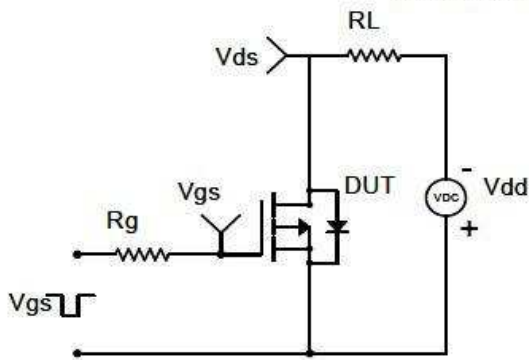


## Typical Performance Characteristics (continue)

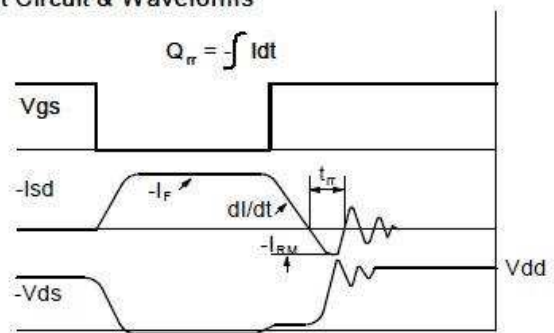
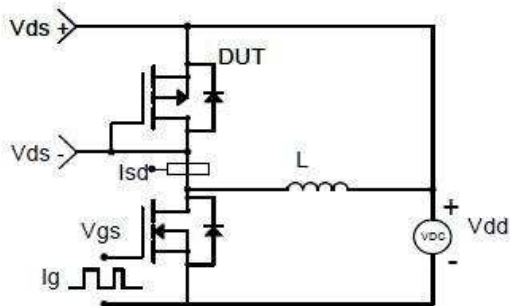
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

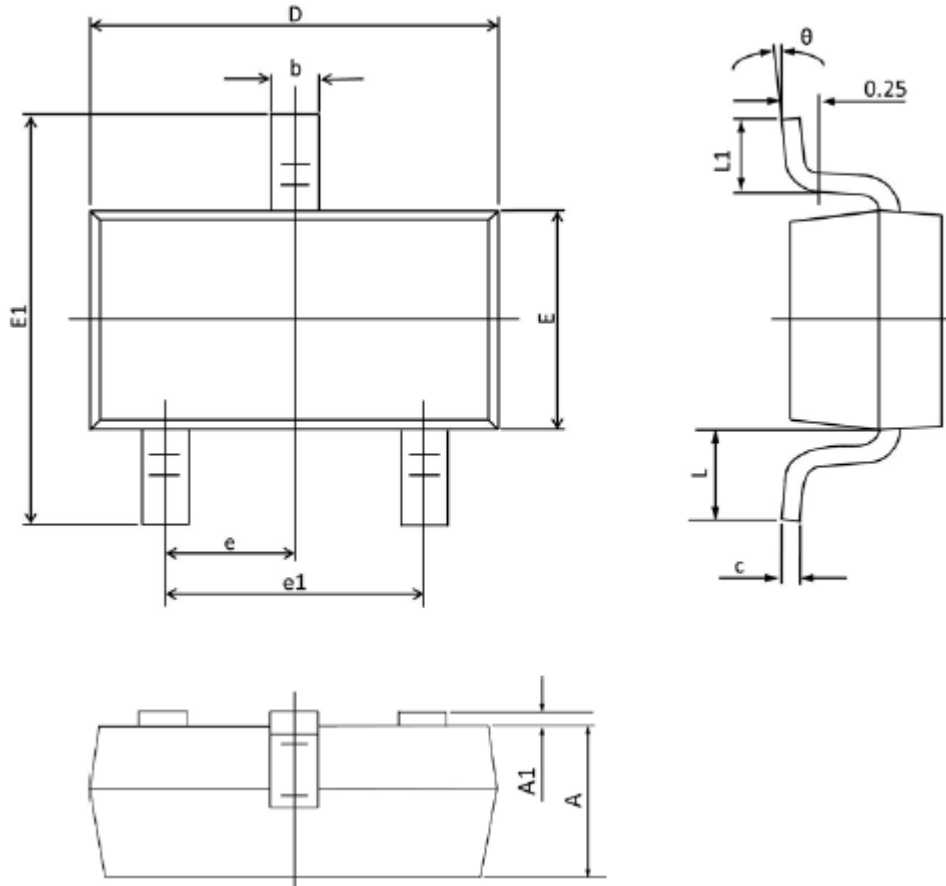


Diode Recovery Test Circuit & Waveforms



Package Dimension

SOT-23









Dimensions				
SYMBOL	Millimeters		Inches	
	MIN	MAX	MIN	MAX
A	0.9	1.105	0.035	0.041
A1	0	0.1	0	0.004
b	0.3	0.5	0.012	0.02
c	0.08	0.15	0.003	0.006
D	2.8	3.0	0.11	0.118
E	1.2	1.4	0.047	0.055
E1	2.25	2.55	0.089	0.1
e	0.95 TYP.		0.037 TYP.	
e1	1.8	2.0	0.071	0.079
L	0.55 REF.		0.022 REF.	
L1	0.3	0.5	0.012	0.02
$\theta$	0°	8°	0°	8°

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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