

# GSM2304

## 30V N-Channel Enhancement Mode MOSFET

### Product Description

GSM2304, N-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, and low in-line power loss are needed in commercial industrial surface mount applications.

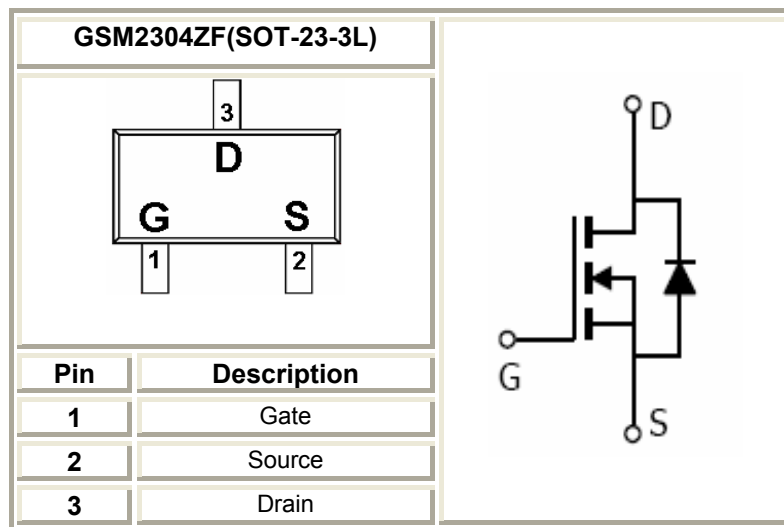
### Features

- 30V/3.6A,  $R_{DS(ON)}=78m\Omega@VGS=10V$
- 30V/2.8A,  $R_{DS(ON)}=105m\Omega@VGS=4.5V$
- Super high density cell design for extremely low  $R_{DS(ON)}$
- SOT-23-3L package design

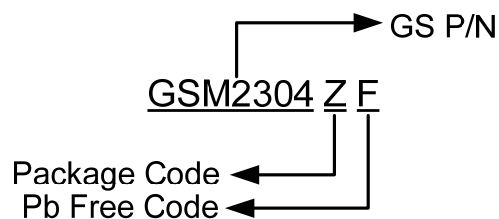
### Applications

- Power Management in Note book
- LED Display
- DC-DC System
- LCD Panel

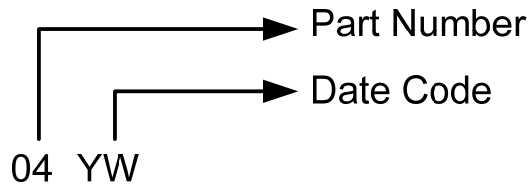
### Packages & Pin Assignments



### Ordering Information



## Marking Information



Part Number	Package	Part Marking	Quantity
GSM2304ZF	SOT-23-3L	04YW	3000pcs

## Absolute Maximum Ratings

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

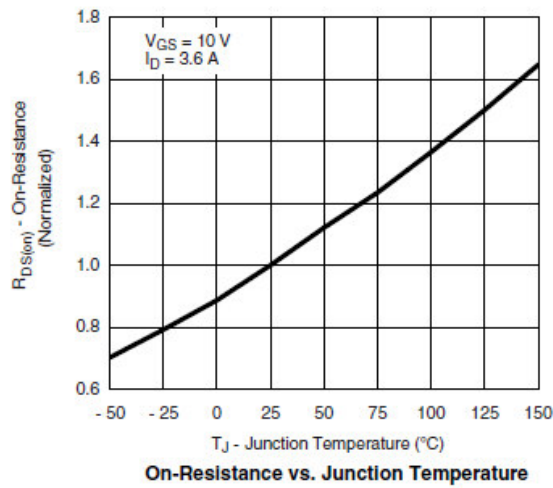
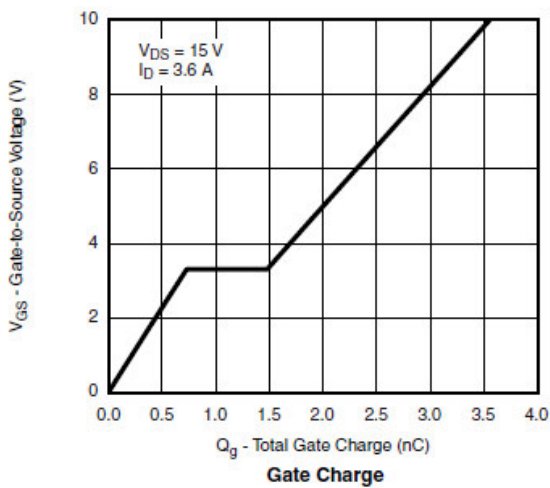
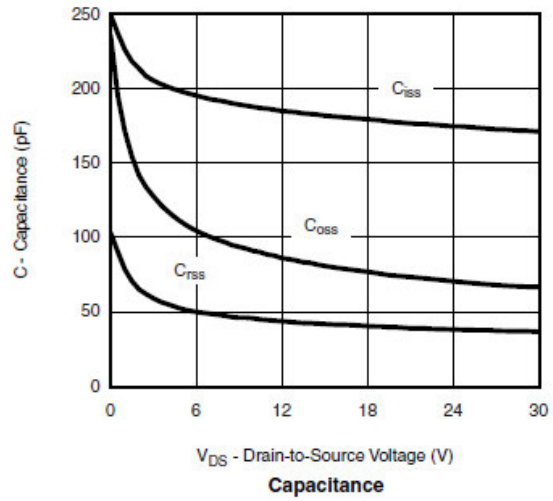
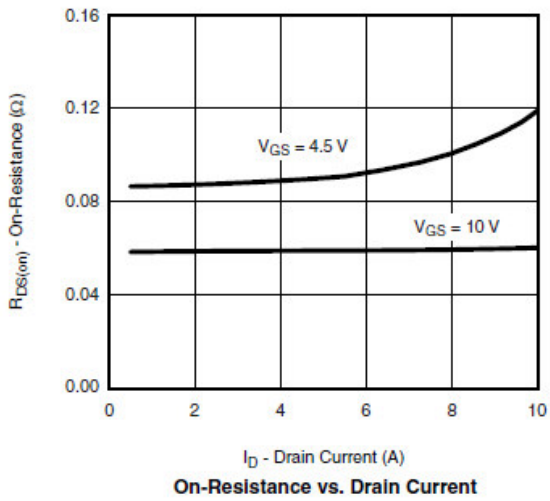
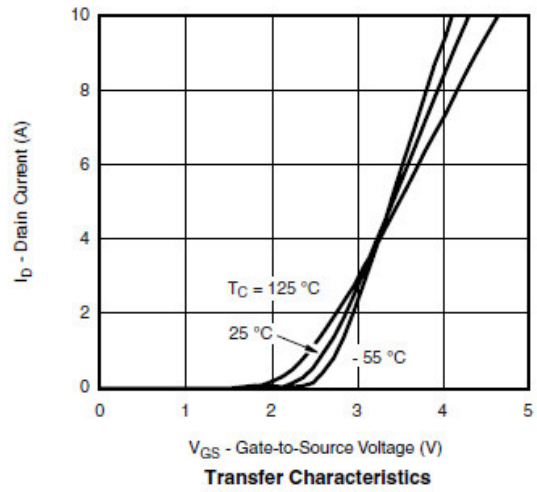
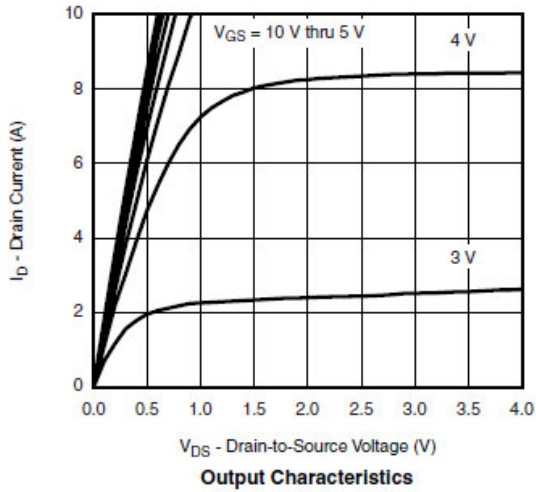
Symbol	Parameter	Typical	Unit
$V_{DSS}$	Drain-Source Voltage	30	V
$V_{GSS}$	Gate –Source Voltage	$\pm 20$	V
$I_D$	Continuous Drain Current ( $T_J=150^{\circ}\text{C}$ )	$T_A=25^{\circ}\text{C}$	3.6
		$T_A=70^{\circ}\text{C}$	3.2
$I_{DM}$	Pulsed Drain Current	20	A
$I_S$	Continuous Source Current (Diode Conduction)	1.5	A
$P_D$	Power Dissipation	$T_A=25^{\circ}\text{C}$	1.25
		$T_A=70^{\circ}\text{C}$	0.8
$T_J$	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

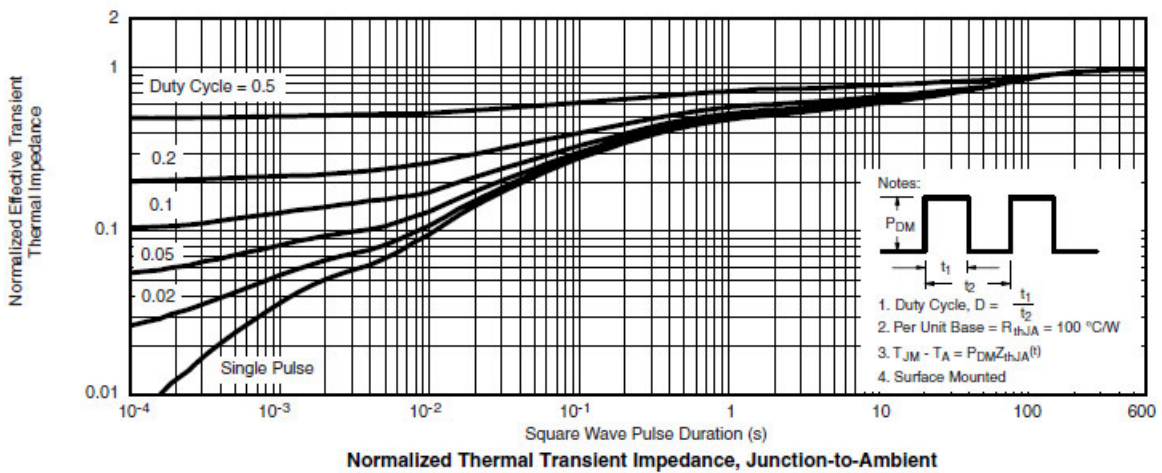
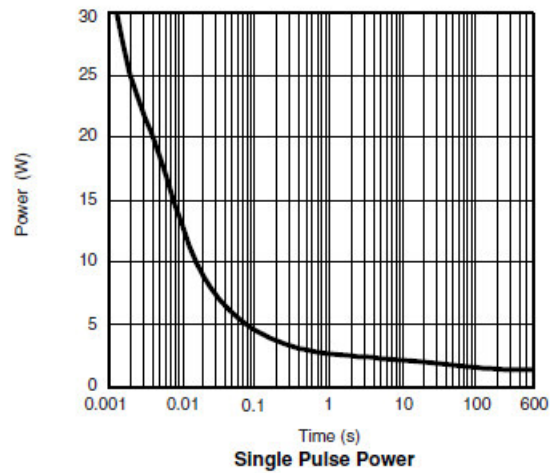
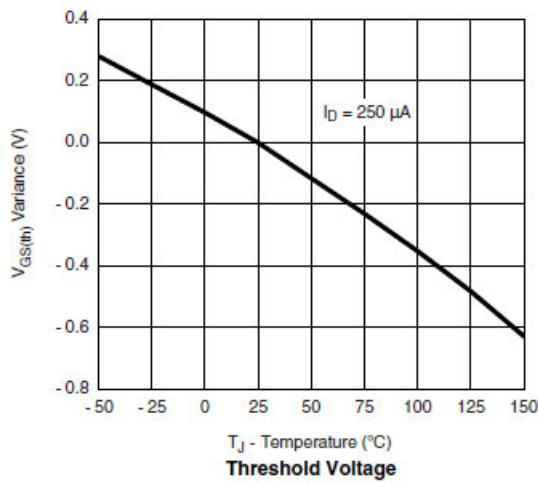
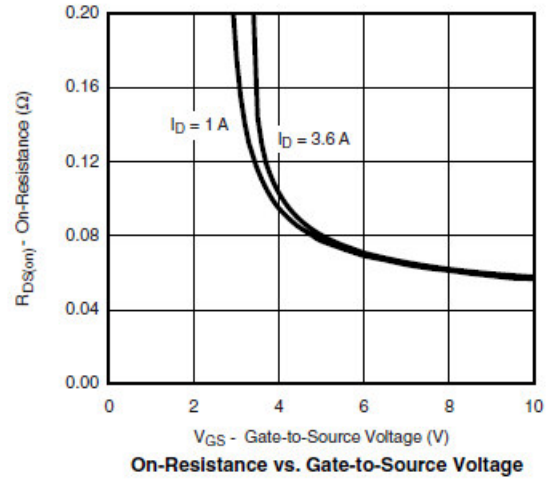
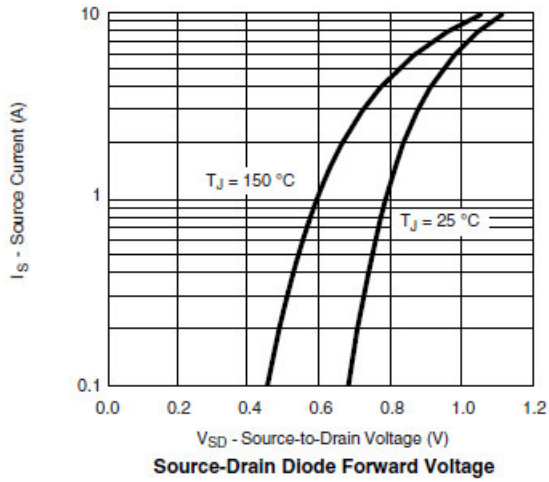
T<sub>A</sub>=25°C unless otherwise noted

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Static</b>						
V <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	30			V
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	1.2		2.2	
I <sub>GSS</sub>	Gate Leakage Current	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V			±100	nA
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V			1	uA
		V <sub>DS</sub> =30V, V <sub>GS</sub> =0V, T <sub>J</sub> =85°C			30	
I <sub>D(on)</sub>	On-State Drain Current	V <sub>DS</sub> ≥4.5V, V <sub>GS</sub> =10V	6			A
R <sub>DS(on)</sub>	Drain-Source On-Resistance	V <sub>GS</sub> = 10V, I <sub>D</sub> =3.6A		68	78	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =2.6A		90	105	
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> =15V, I <sub>D</sub> =4.8A		11		S
V <sub>SD</sub>	Diode Forward Voltage	I <sub>S</sub> =2.7A, V <sub>GS</sub> =0V		0.8	1.2	V
<b>Dynamic</b>						
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =15V, V <sub>GS</sub> =4.5V, I <sub>D</sub> =3.4A		2.0	3.6	nC
Q <sub>gs</sub>	Gate-Source Charge			0.8		
Q <sub>gd</sub>	Gate-Drain Charge			0.65		
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =15V, V <sub>GS</sub> =0V, f=1MHz		230		pF
C <sub>oss</sub>	Output Capacitance			50		
C <sub>rss</sub>	Reverse Transfer Capacitance			20		
t <sub>d(on)</sub>	Turn-On Time	V <sub>DD</sub> =15V, R <sub>L</sub> =5.6Ω, I <sub>D</sub> ≅2.7A, V <sub>GEN</sub> =4.5V, R <sub>G</sub> =1Ω		10	12	ns
t <sub>r</sub>				45	60	
t <sub>d(off)</sub>	Turn-Off Time			12	18	
t <sub>f</sub>				20	30	

## Typical Performance Characteristics

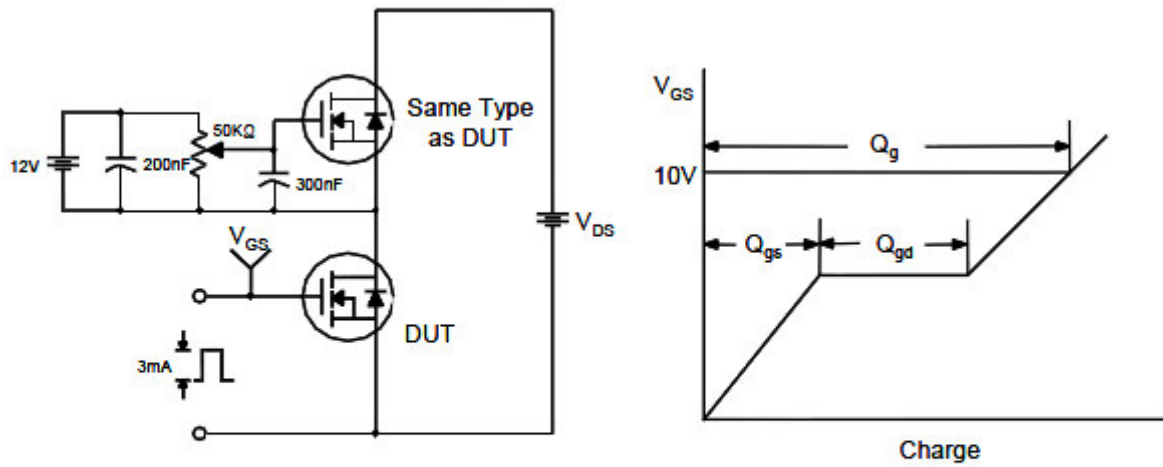


## Typical Performance Characteristics (Continue)

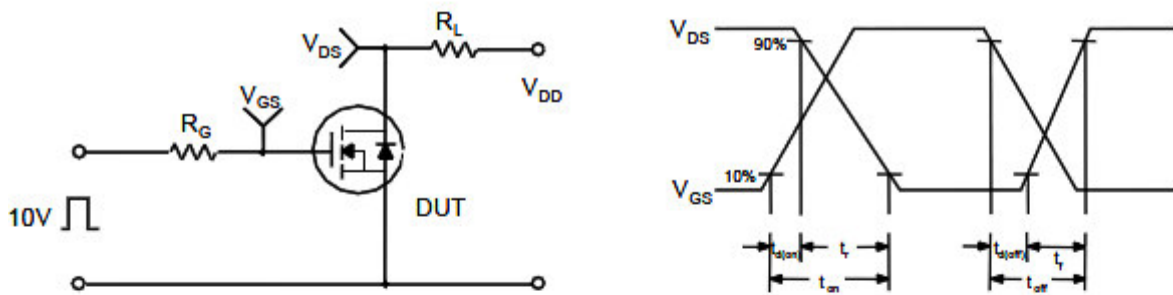


## Typical Performance Characteristics (Continue)

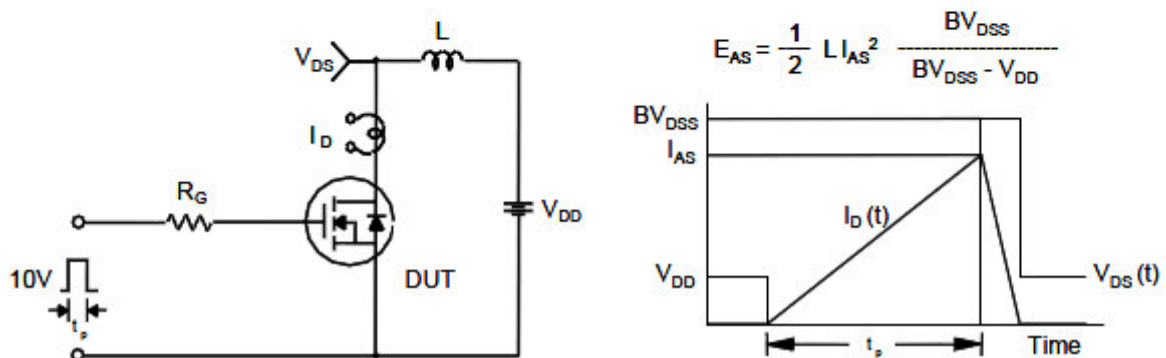
### Gate Charge Test Circuit & Waveform



### Resistive Switching Test Circuit & Waveforms

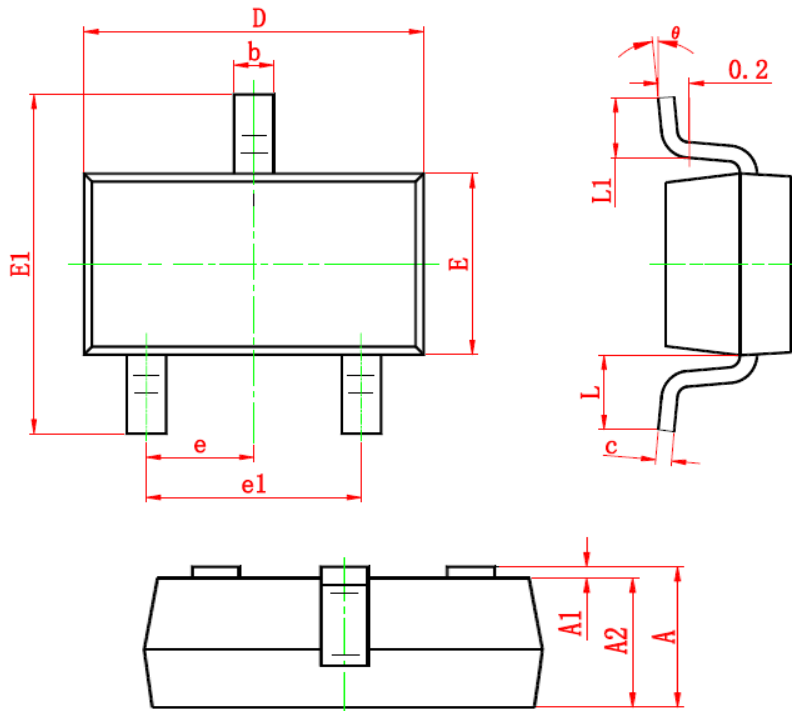


### Unclamped Inductive Switching Test Circuit & Waveforms



## Package Dimension

### SOT-23-3L PLASTIC PACKAGE







Dimensions				
Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.400	0.012	0.016
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950 (TYP)		0.037 (TYP)	
e1	1.800	2.000	0.071	0.079
L	0.700 (REF)		0.028 (REF)	
L1	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°



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