

# GSM8987

## 90V N-Channel Enhancement Mode MOSFET

### Product Description

GSM8987, 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.

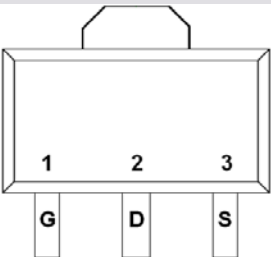
### Features

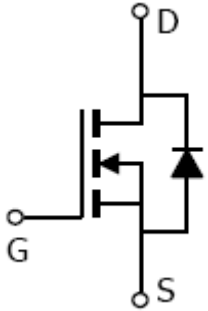
- 90V/2.3A,  $R_{DS(ON)}=310m\Omega@V_{GS}=10V$
- 90V/1.8A,  $R_{DS(ON)}=320m\Omega@V_{GS}=4.5V$
- Super high density cell design for extremely low  $R_{DS(ON)}$
- SOT-89-3L package design

### Applications

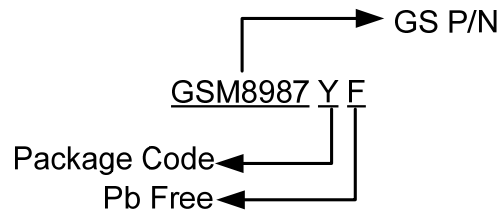
- Motor and Load Control
- Power Management in White LED System
- Push Pull Converter
- LCD TV Inverter & AD/DC Inverter Systems.

### Packages & Pin Assignments

GSM8987YF(SOT-89-3L)	
	
Pin	Description
1	Gate
2	Drain
3	Source

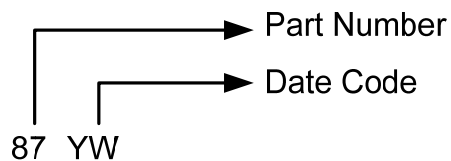


## Ordering Information



Part Number	Package	Quantity Reel
GSM8987YF	SOT-89-3L	1000 PCS

## Marking Information



## Absolute Maximum Ratings

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

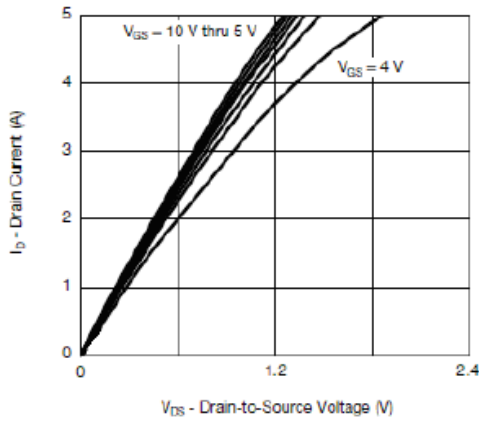
Symbol	Parameter	Typical	Unit
V <sub>DSS</sub>	Drain-Source Voltage	90	V
V <sub>GSS</sub>	Gate –Source Voltage	±20	V
I <sub>D</sub>	Continuous Drain Current(T <sub>J</sub> =150°C)	T <sub>A</sub> =25°C	2.3
		T <sub>A</sub> =70°C	1.8
I <sub>DM</sub>	Pulsed Drain Current	6	A
I <sub>S</sub>	Continuous Source Current(Diode Conduction)	1.6	A
P <sub>D</sub>	Power Dissipation	T <sub>A</sub> =25°C	1.45
		T <sub>A</sub> =70°C	0.6
T <sub>J</sub>	Operating Junction Temperature	150	°C
T <sub>STG</sub>	Storage Temperature Range	-55 to150	°C
R <sub>θJA</sub>	Thermal Resistance-Junction to Ambient	120	°C/W

## Electrical Characteristics

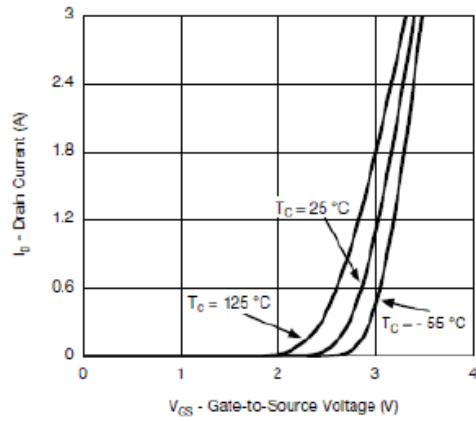
T<sub>A</sub>=25°C Unless otherwise noted

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	90			V
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> = 250uA	0.9		1.9	
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> = 72V, V <sub>GS</sub> =0V			1	uA
		V <sub>DS</sub> =72V, V <sub>GS</sub> =0V, T <sub>J</sub> =85°C			10	
I <sub>D(on)</sub>	On-State Drain Current	V <sub>DS</sub> ≥ 5V, V <sub>GS</sub> = 4.5V	6			A
R <sub>DS(on)</sub>	Drain-Source On-Resistance	V <sub>GS</sub> = 10V, I <sub>D</sub> = 2.3A		260	310	mΩ
		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 1.8A		270	320	
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> = 20V, I <sub>D</sub> = 1.5A		2		S
V <sub>SD</sub>	Diode Forward Voltage	I <sub>S</sub> = 1.3A, V <sub>GS</sub> =0V		0.85	1.2	V
<b>Dynamic</b>						
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =50V, V <sub>GS</sub> =4.5V, I <sub>D</sub> =1.6A		2.8	5.8	nC
Q <sub>gs</sub>	Gate-Source Charge			0.75		
Q <sub>gd</sub>	Gate-Drain Charge			1.4		
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =50V, V <sub>GS</sub> =0V, f=1MHz		200		pF
C <sub>oss</sub>	Output Capacitance			22		
C <sub>rss</sub>	Reverse Transfer Capacitance			13		
t <sub>d(on)</sub>	Turn-On Time	V <sub>DD</sub> =50V, R <sub>L</sub> =39Ω, I <sub>D</sub> =1.3A, V <sub>GEN</sub> =4.5V, R <sub>G</sub> =1Ω		4	6	ns
t <sub>r</sub>				20	40	
t <sub>d(off)</sub>	Turn-Off Time			15	25	
t <sub>f</sub>				15	30	

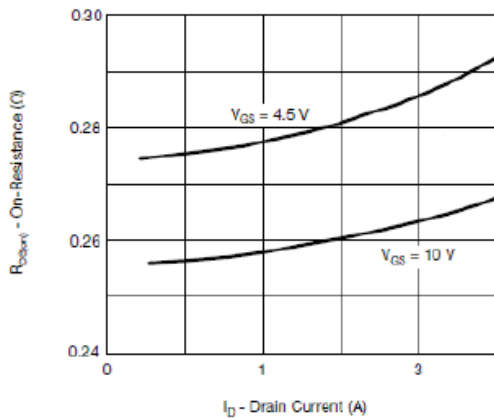
## Typical Performance Characteristics



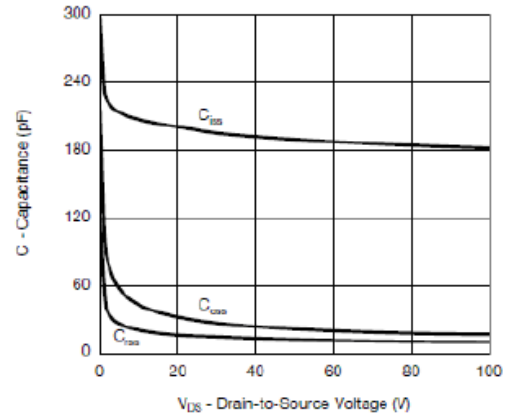
Output Characteristics



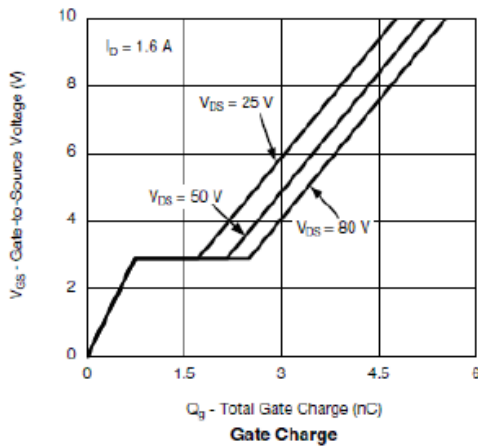
Transfer Characteristics



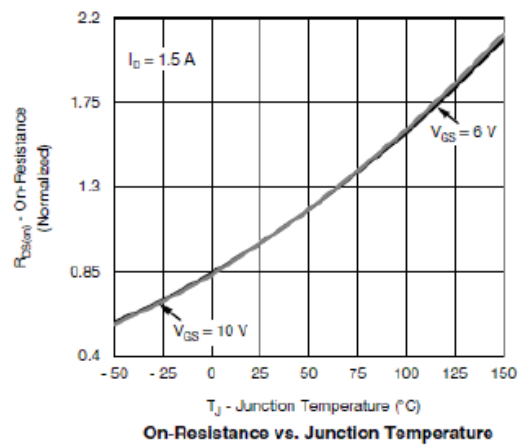
On-Resistance vs. Drain Current and Gate Voltage



Capacitance

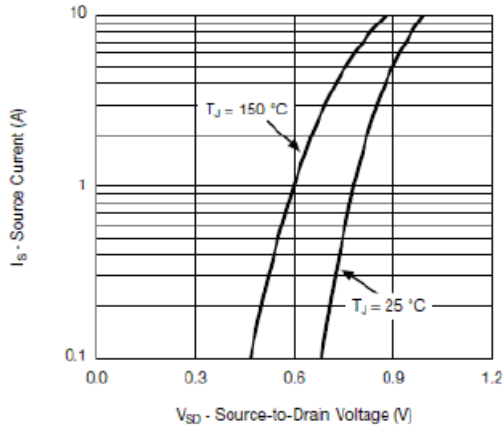


Gate Charge

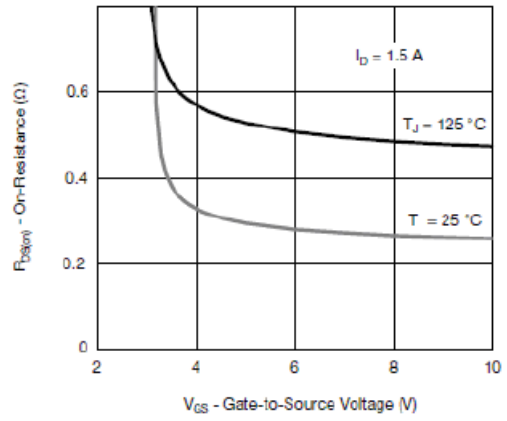


On-Resistance vs. Junction Temperature

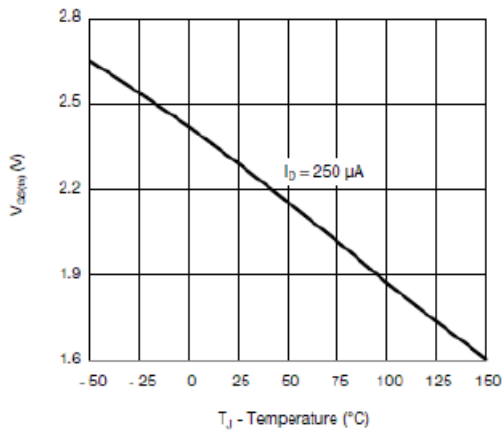
## Typical Performance Characteristics (continue)



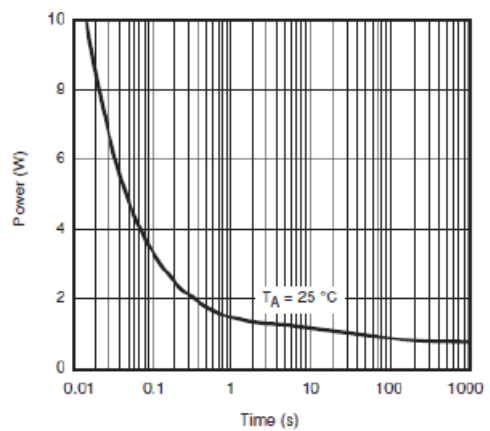
Source-Drain Diode Forward Voltage



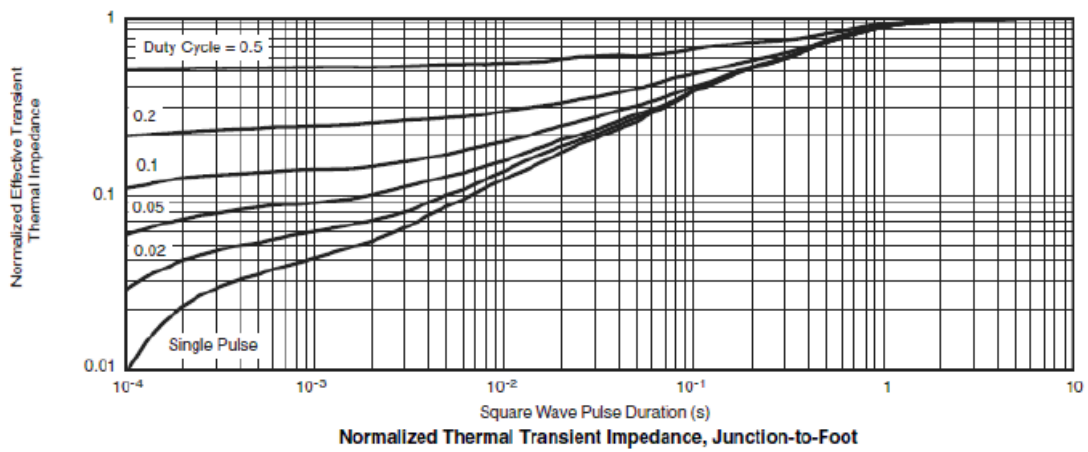
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



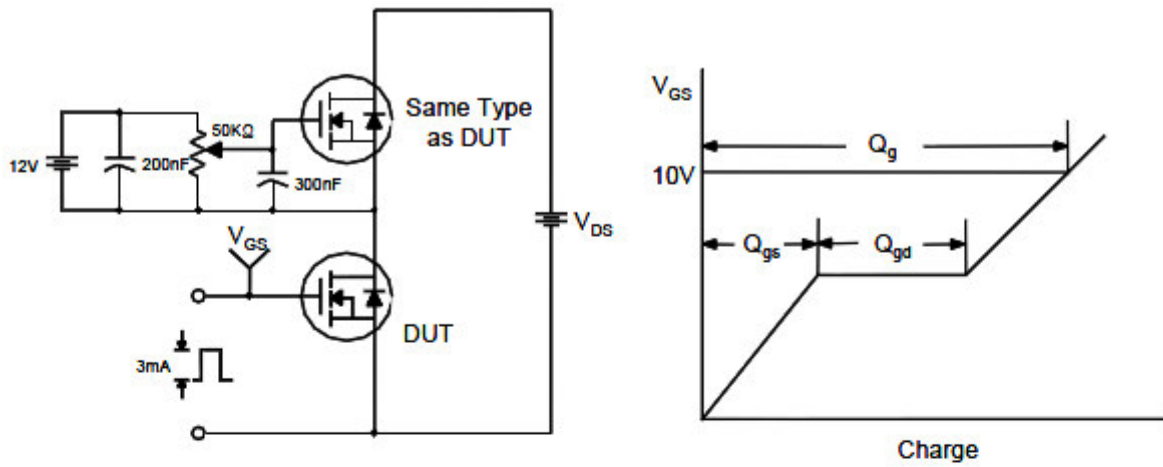
Single Pulse Power



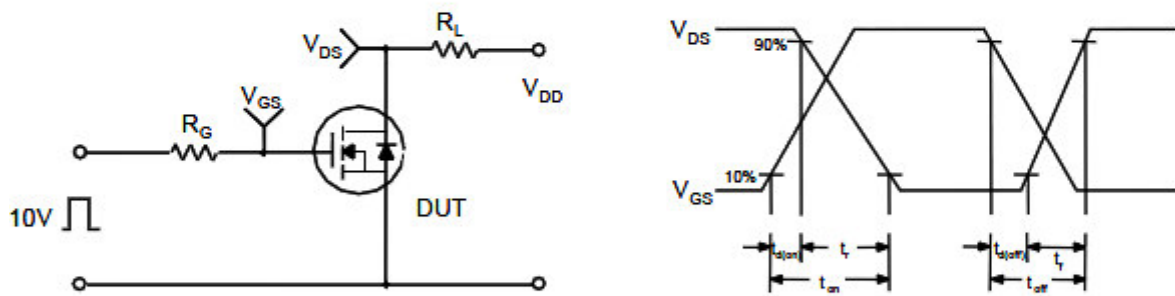
Normalized Thermal Transient Impedance, Junction-to-Foot

## Typical Performance Characteristics (continue)

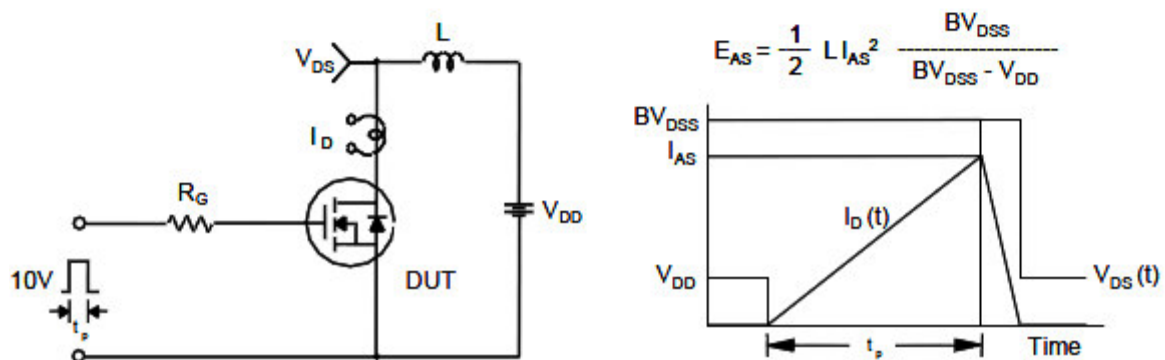
### Gate Charge Test Circuit & Waveform



### Resistive Switching Test Circuit & Waveforms

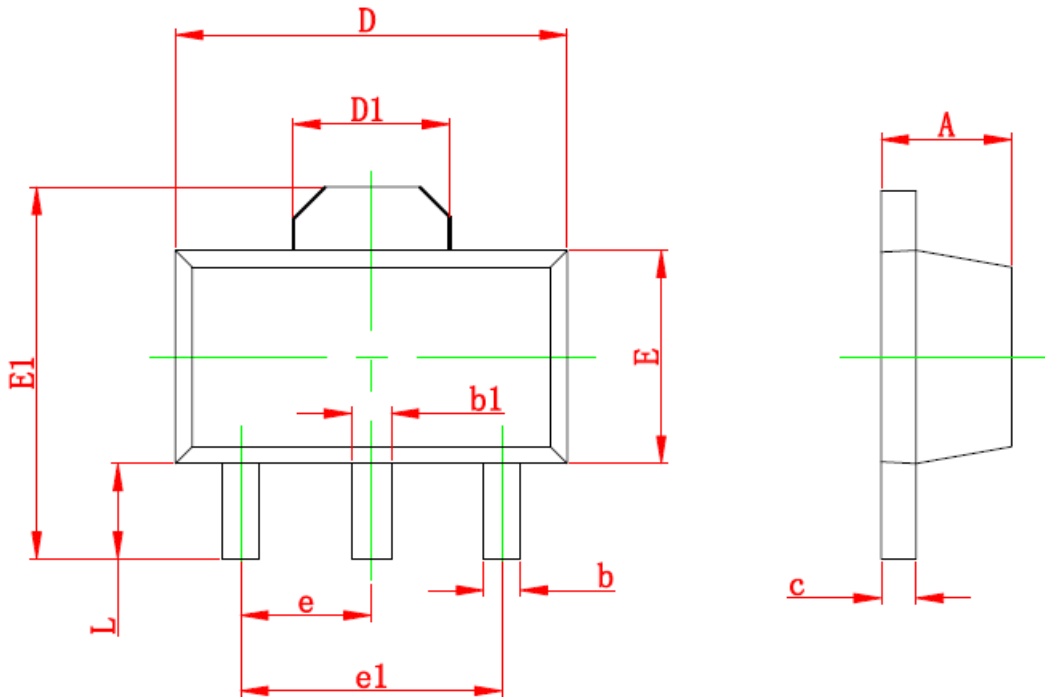


### Unclamped Inductive Switching Test Circuit & Waveforms



Package Dimension

SOT-89-3L







Dimensions				
Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.197
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 (REF)		0.061 (REF)	
E	2.30	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.50 (TYP)		0.060 (TYP)	
e1	3.00 (TYP)		0.118 (TYP)	
L	0.900 (TYP)	1.200	0.035	0.047



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## CONTACT US

GS Headquarter	
	4F.,No.431,Lane11,Sec.6,Minquan E.Rd Neihu District Taipei City 114, Taiwan (R.O.C)
	886226579980
	886226573630
	sales_twn@gspower.com

WuXi Branch	
	No.21 Changjiang Rd., WND, Wuxi, Jiangsu, China (INFO. & TECH. Science Park Building A 210 Room)
	8651085217051
	8651085211238
	sales_cn@gspower.com

RD Division	
	824 Bolton Drive Milpitas. CA. 95035
	14084570587