

GSM3993

30V P-Channel Enhancement Mode MOSFET

Product Description

GSM3993, 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, and low in-line power loss are needed in commercial industrial surface mount applications.

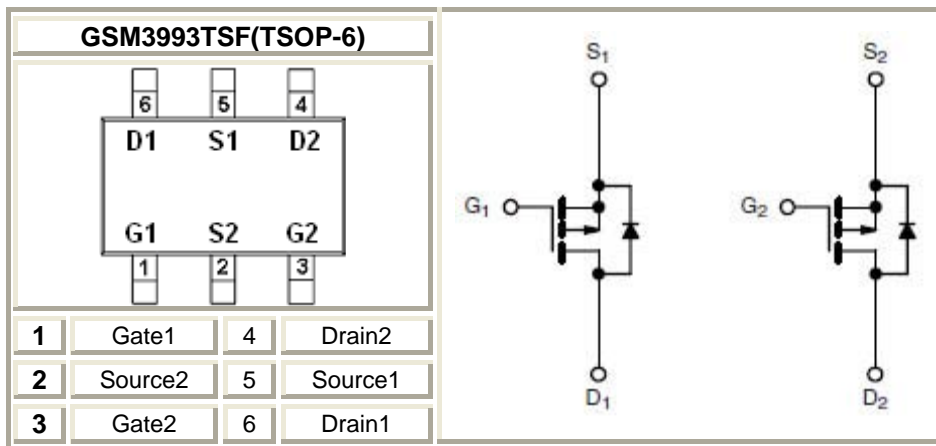
Features

- -30V/-3.6A, $R_{DS(ON)}=150m\Omega@V_{GS}=-10.0V$
- -30V/-3.2A, $R_{DS(ON)}=235m\Omega@V_{GS}=-4.5V$
- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- TSOP-6 package design

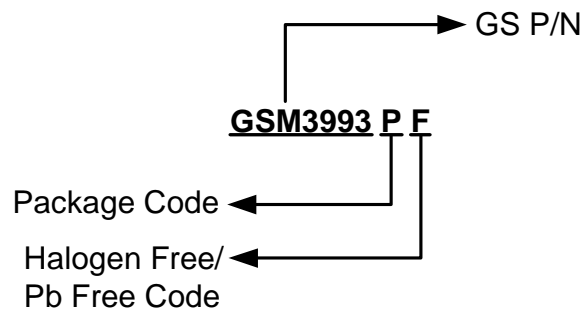
Applications

- Battery Switch for Portable Devices
- Computers
Bus Switch
Load Switch
LED Display

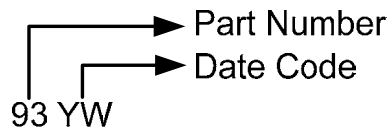
Packages & Pin Assignments



Ordering Information



Marking Information



Part Number	Package	Part Marking
GSM3993TSF	TSOP-6	93YW

Absolute Maximum Ratings

(T_A=25°C unless otherwise noted)

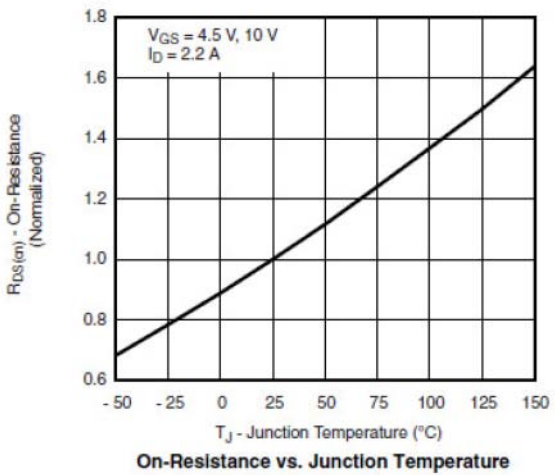
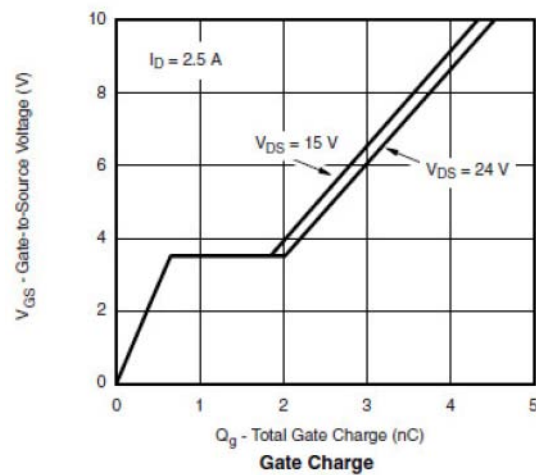
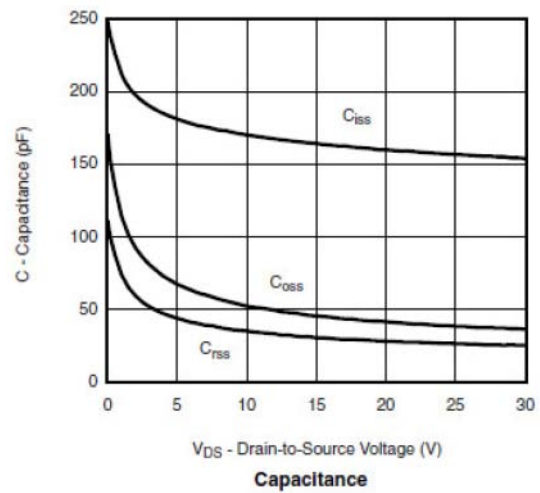
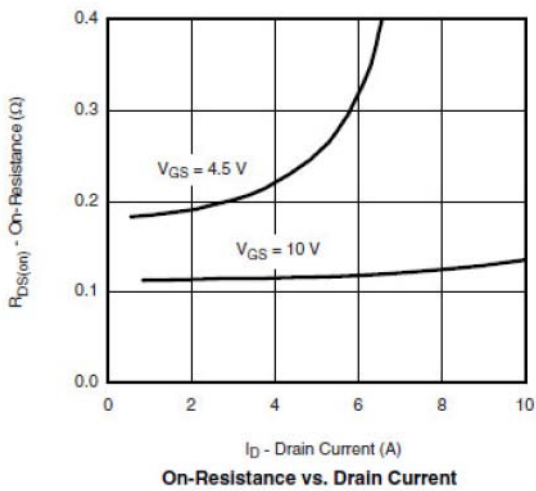
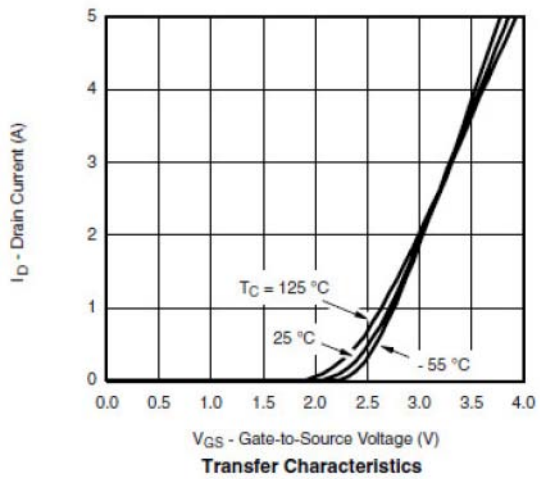
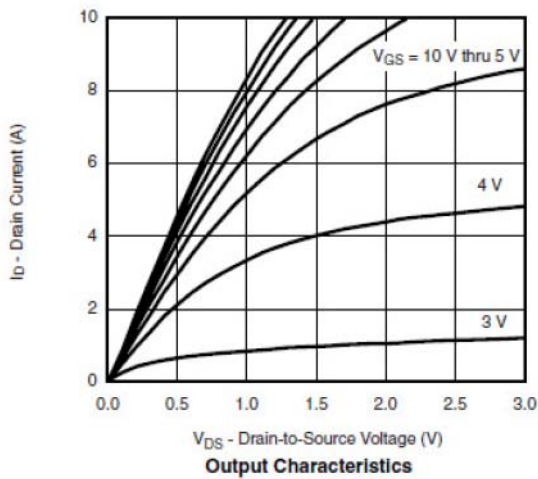
Symbol	Parameter	Typical	Unit	
V _{DSS}	Drain-Source Voltage	-30	V	
V _{GSS}	Gate –Source Voltage	±20	V	
I _D	Continuous Drain Current(T _J =150°C)	T _A =25°C	-3.6	A
		T _A =70°C	-3.0	
I _{DM}	Pulsed Drain Current	-15	A	
I _S	Continuous Source Current(Diode Conduction)	-1.5	A	
P _D	Power Dissipation	T _A =25°C	2.0	W
		T _A =70°C	1.3	
T _J	Operating Junction Temperature	150	°C	
T _{STG}	Storage Temperature Range	-55/150	°C	
R _{θJA}	Thermal Resistance-Junction to Ambient	120	°C/ W	

Electrical Characteristics

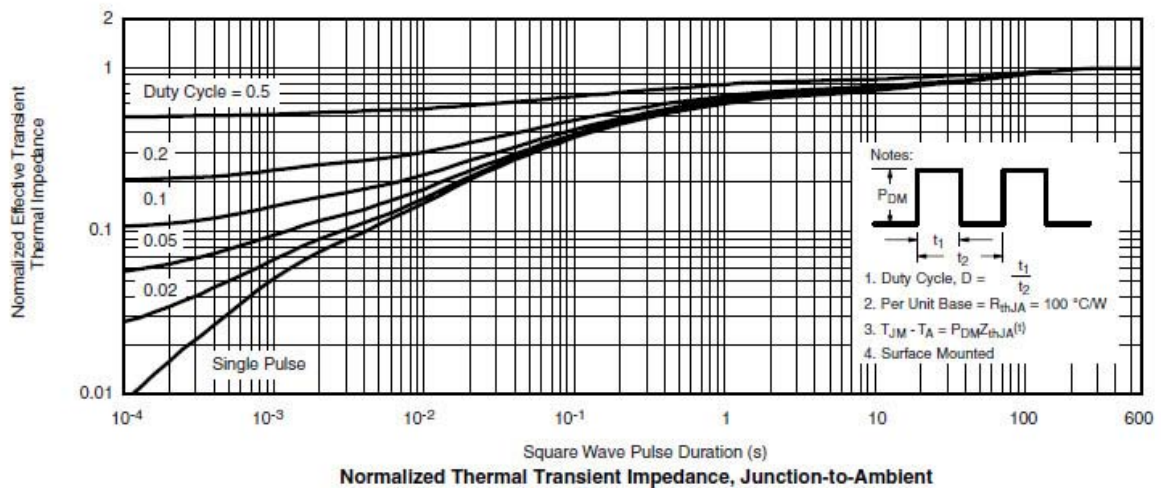
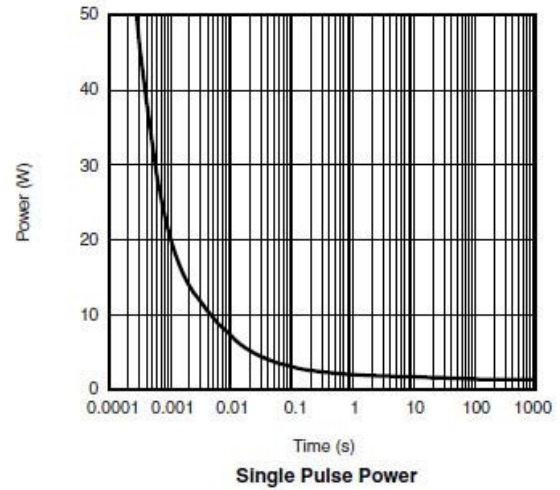
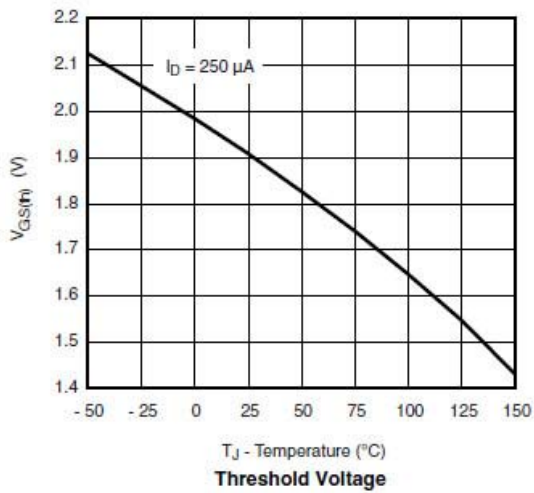
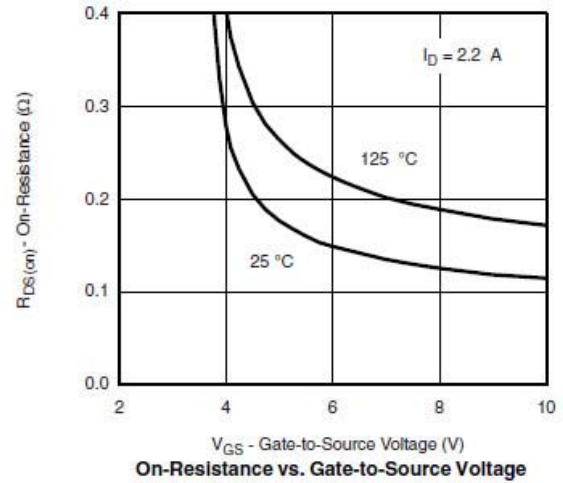
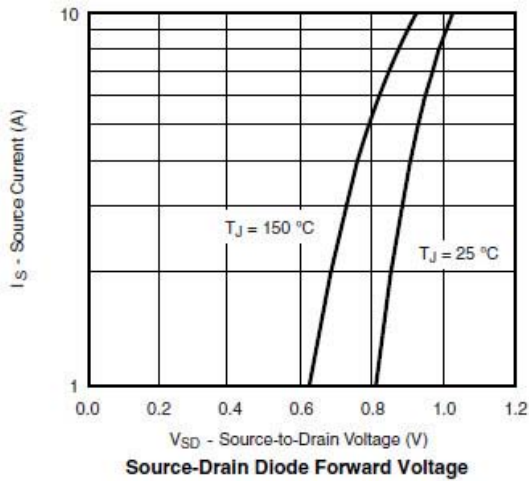
($T_A=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ	Max.	Unit
Static						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-30			V
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1.0		-2.6	
I_{GSS}	Gate Leakage Current	$V_{DS}=0V, V_{GS}=\pm 20V$			± 100	nA
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=-24V, V_{GS}=0V$			-1	uA
		$V_{DS}=-24V, V_{GS}=0V, T_J=85^\circ\text{C}$			-30	
$I_{D(on)}$	On-State Drain Current	$V_{DS}\leq -5V, V_{GS}=-10V$	-10			A
$R_{DS(on)}$	Drain-Source On-Resistance	$V_{GS}=-10.0V, I_D=-3.6A$		135	150	m Ω
		$V_{GS}=-4.5V, I_D=-3.2A$		220	235	
g_{fs}	Forward Transconductance	$V_{DS}=-5V, I_D=-4.0A$		10		S
V_{SD}	Diode Forward Voltage	$I_S=-1.7A, V_{GS}=0V$		-0.7	-1.3	V
Dynamic						
C_{iss}	Input Capacitance	$V_{DS}=-15V, V_{GS}=0V, f=1\text{MHz}$		170		pF
C_{oss}	Output Capacitance			50		
C_{rss}	Reverse Transfer Capacitance			30		
Q_g	Total Gate Charge	$V_{DS}=-15V, V_{GS}=-4.5V, I_D=-2.5A$		2.5		nC
Q_{gs}	Gate-Source Charge			0.8		
Q_{gd}	Gate-Drain Charge			1.0		
$t_{d(on)}$	Turn-On Time	$V_{DD}=-15V, R_L=7.5\Omega, I_D=-2.0A, V_{GEN}=-10V, R_G=1\Omega$		5	10	ns
T_r				10	16	
$t_{d(off)}$	Turn-Off Time			10	16	
T_f				5	10	

Typical Performance Characteristics

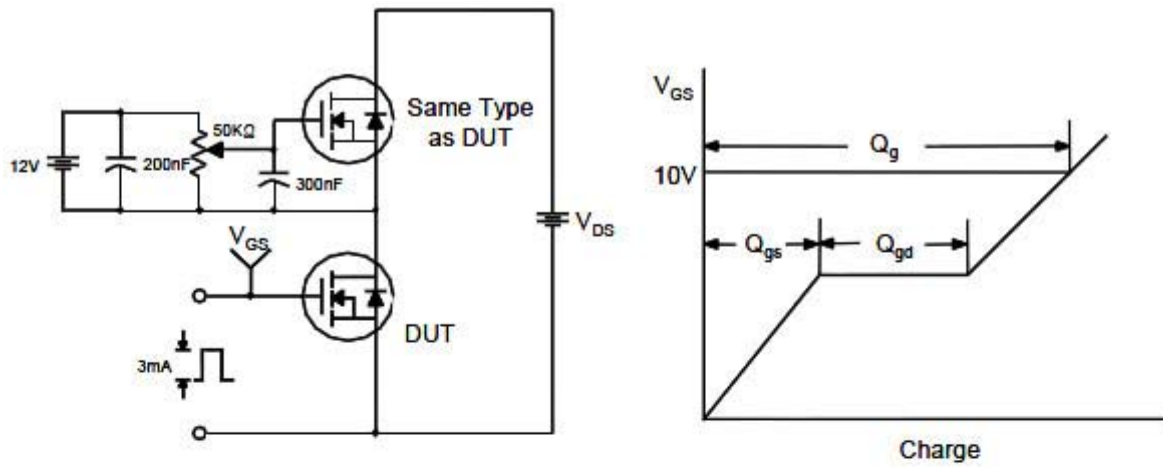


Typical Performance Characteristics (continue)

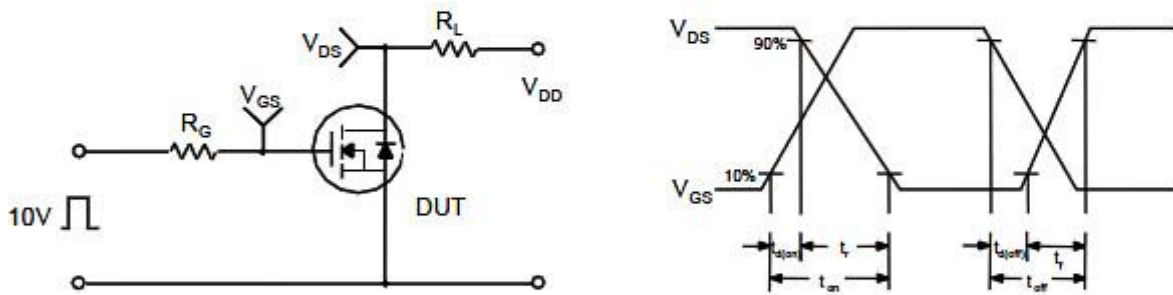


Typical Characteristics

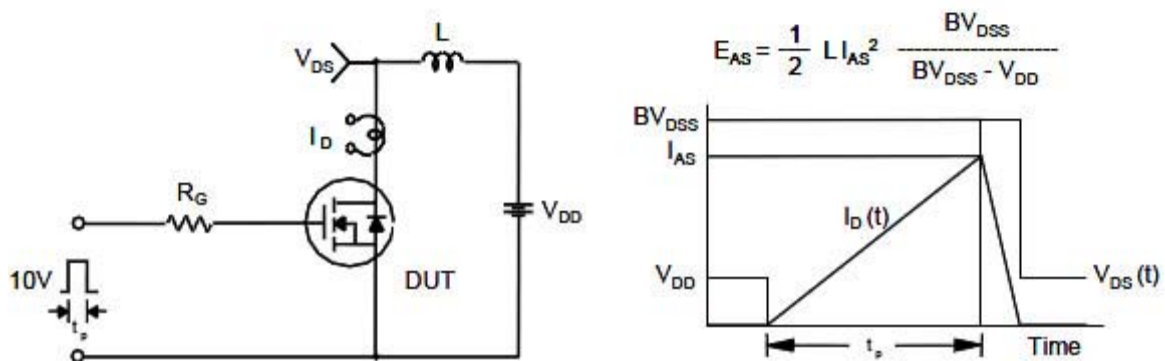
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

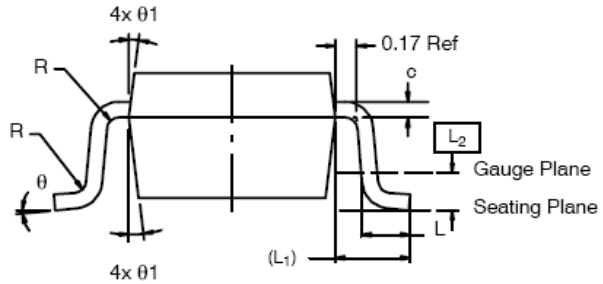
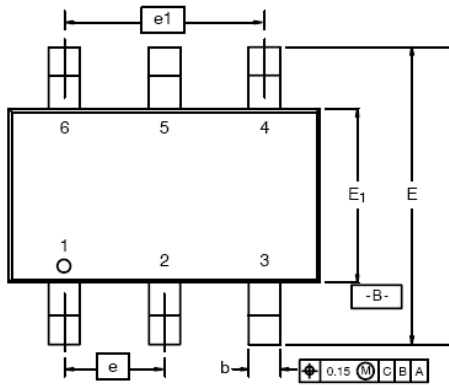


Unclamped Inductive Switching Test Circuit & Waveforms



Package Dimension

TSOP-6 PLASTIC PACKAGE











Dimensions						
SYMBOL	Millimeters			Inches		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.91	-	1.10	0.036	-	0.043
A ₁	0.01	-	0.10	0.0004	-	0.004
A ₂	0.90	-	1.00	0.035	0.038	0.039
b	0.30	0.32	0.45	0.012	0.013	0.018
c	0.10	0.15	0.20	0.004	0.006	0.008
D	2.95	3.05	3.10	0.116	0.120	0.122
E	2.70	2.85	2.98	0.106	0.112	0.117
E ₁	1.55	1.65	1.70	0.061	0.065	0.067
e	1.00 BSC			0.0394 BSC		
e ₁	1.90	2.00	2.10	0.075	0.080	0.085
L	0.35	-	0.50	0.014	-	0.020
L ₁	0.60 Ref			0.024 Ref		
L ₂	0.25 BSC			0.010 BSC		
R	0.10	-	-	0.004	-	-
θ	0°	4°	8°	0°	4°	8°
θ ₁	7° Nom			7° Nom		



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