

GSM4946

60V N-Channel Enhancement Mode MOSFET

Product Description

GSM4946, 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.

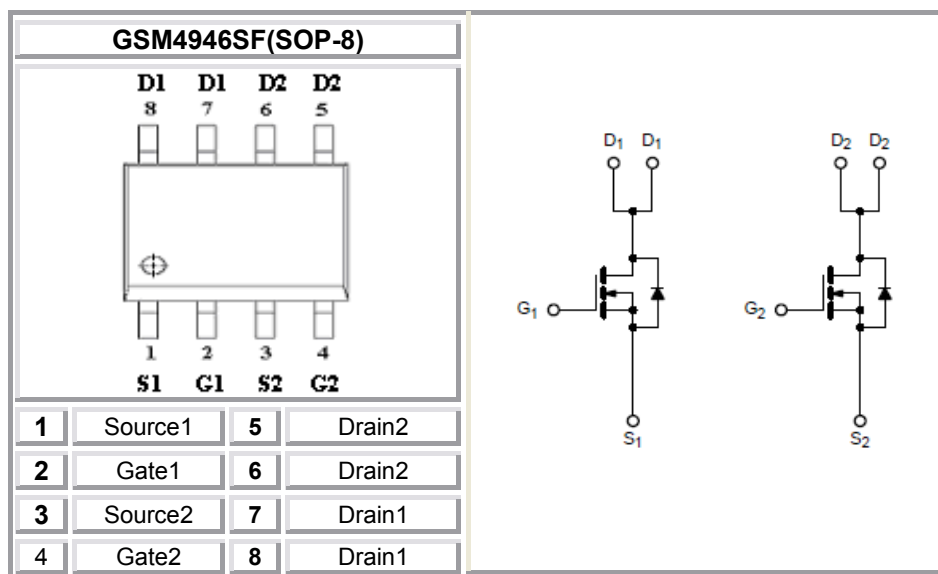
Features

- 60V/6.8A, $R_{DS(ON)}=42m\Omega@V_{GS}=10V$
- 60V/5.6A, $R_{DS(ON)}=50m\Omega@V_{GS}=4.5V$
- Super high density cell design for extremely low $R_{DS(ON)}$
- SOP-8P package design

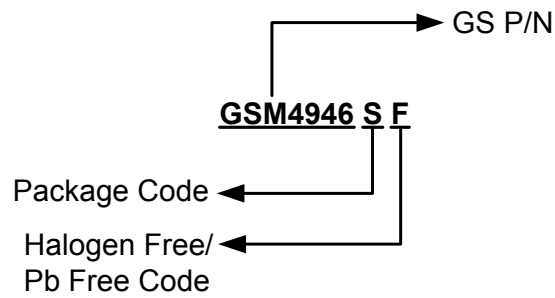
Applications

- Motor and Load Control
- AD/DC Inverter Systems.
- Power Management in White LED System

Packages & Pin Assignments

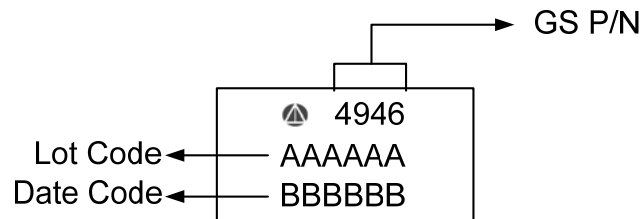


Ordering Information



Part Number	Package	Quantity Reel
GSM4946SF	SOP-8	3000 PCS

Marking Information



Absolute Maximum Ratings

(T_A=25°C unless otherwise noted)

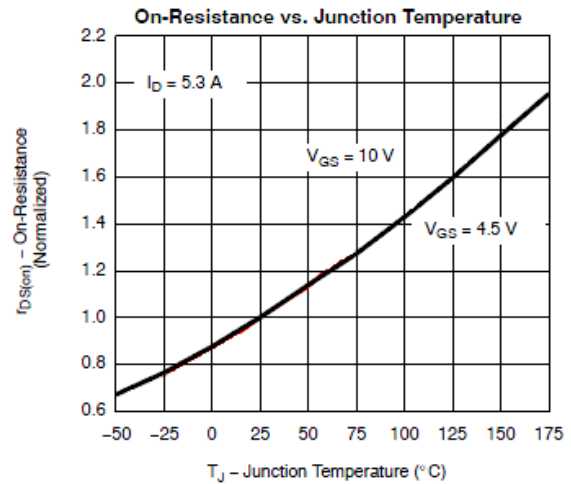
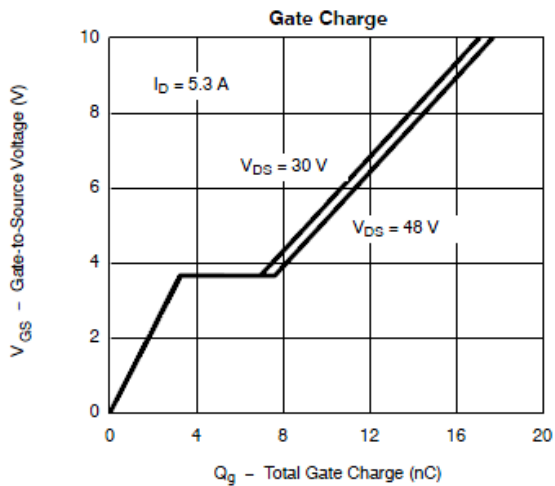
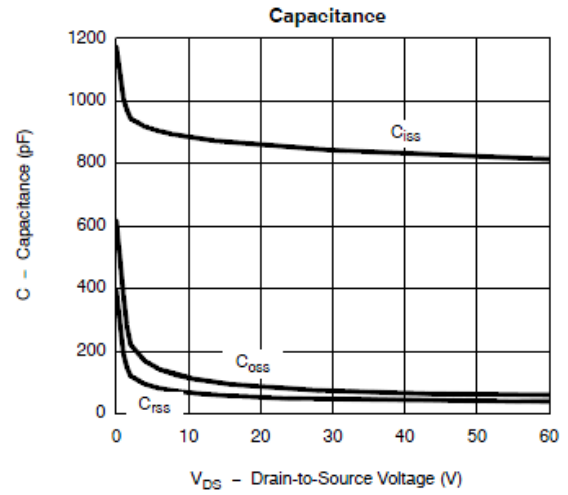
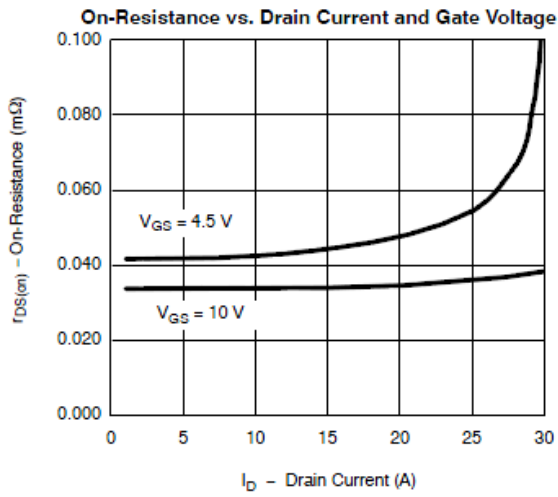
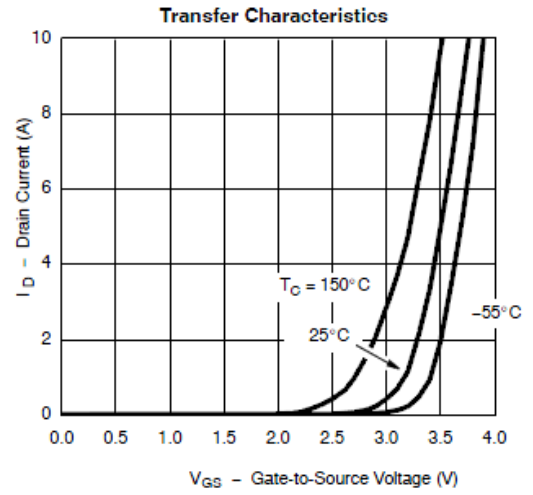
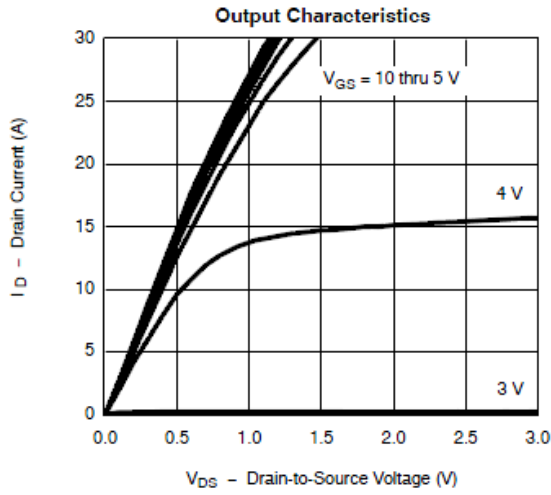
Symbol	Parameter	Typical	Unit	
V _{DSS}	Drain-Source Voltage	60	V	
V _{GSS}	Gate –Source Voltage	±20	V	
I _D	Continuous Drain Current(T _J =150°C)	T _A =25°C	6.8	A
		T _A =70°C	5.6	
I _{DM}	Pulsed Drain Current	30	A	
I _S	Continuous Source Current(Diode Conduction)	1.5	A	
P _D	Power Dissipation	T _A =25°C	2.8	W
		T _A =70°C	1.8	
T _J	Operating Junction Temperature	150	°C	
T _{STG}	Storage Temperature Range	-55/150	°C	
R _{θJA}	Thermal Resistance-Junction to Ambient	62.5	°C/W	

Electrical Characteristics

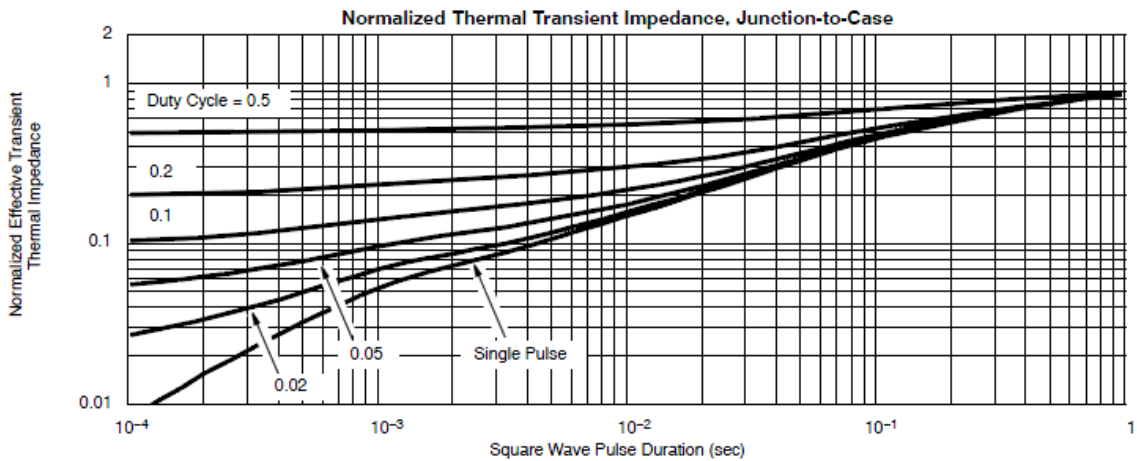
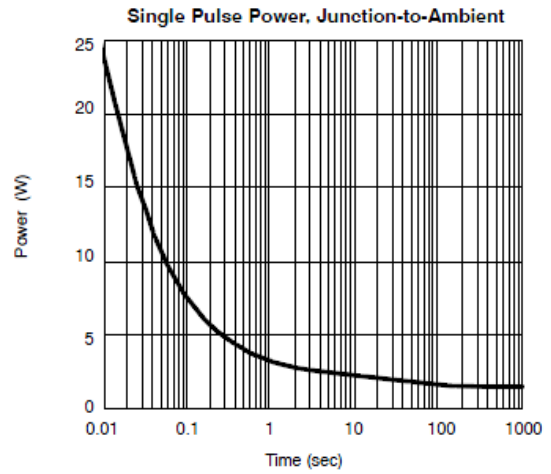
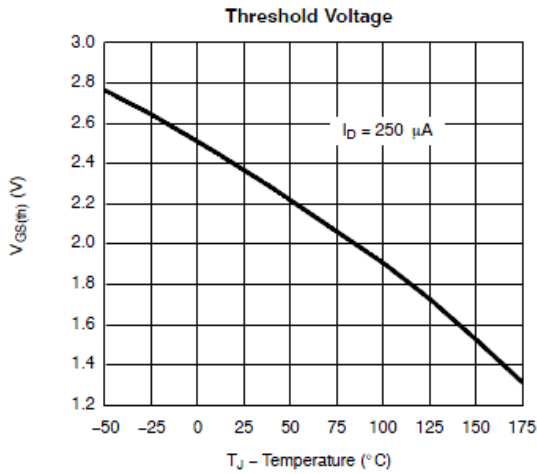
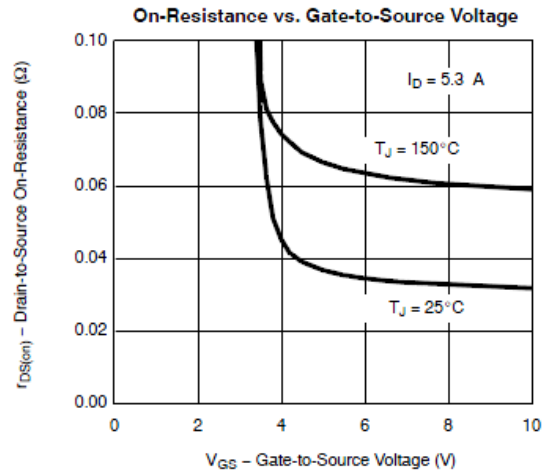
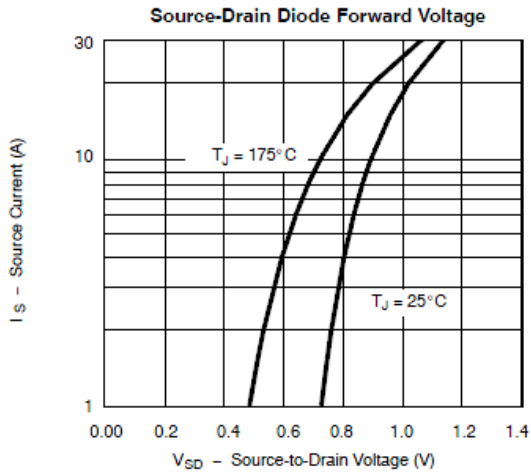
($T_A=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ	Max.	Unit
Static						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	60			V
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0		2.5	
I_{GSS}	Gate Leakage Current	$V_{DS}=0V, V_{GS}=\pm 20V$			± 100	nA
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=60V, V_{GS}=0V$			1	μA
		$V_{DS}=60V, V_{GS}=0V$ $T_J=85^\circ\text{C}$			5	
$I_{D(on)}$	On-State Drain Current	$V_{DS} \geq 5V, V_{GS}=4.5V$	30			A
$R_{DS(on)}$	Drain-Source On-Resistance	$V_{GS}=10V, I_D=6.8A$		38	42	m Ω
		$V_{GS}=4.5V, I_D=5.6A$		42	50	
g_{fs}	Forward Transconductance	$V_{DS}=15V, I_D=5.3A$		24		S
V_{SD}	Diode Forward Voltage	$I_S=2.0A, V_{GS}=0V$		0.8	1.2	V
Dynamic						
C_{iss}	Input Capacitance	$V_{DS}=30V, V_{GS}=0V$ $f=1\text{MHz}$		890		μF
C_{oss}	Output Capacitance			85		
C_{rss}	Reverse Transfer Capacitance			48		
Q_g	Total Gate Charge	$V_{DS}=30V, V_{GS}=5V$ $I_D \approx 5.6A$		10	15	nC
Q_{gs}	Gate-Source Charge			3.5		
Q_{gd}	Gate-Drain Charge			3.6		
$t_{d(on)}$	Turn-On Time	$V_{DD}=30V, R_L=6.8\Omega$ $I_D \approx 5.0A, V_{GEN}=4.5V$ $R_G=6\Omega$		10	15	ns
T_r				12	20	
$t_{d(off)}$	Turn-Off Time			25	35	
T_f				10	15	

Typical Performance Characteristics

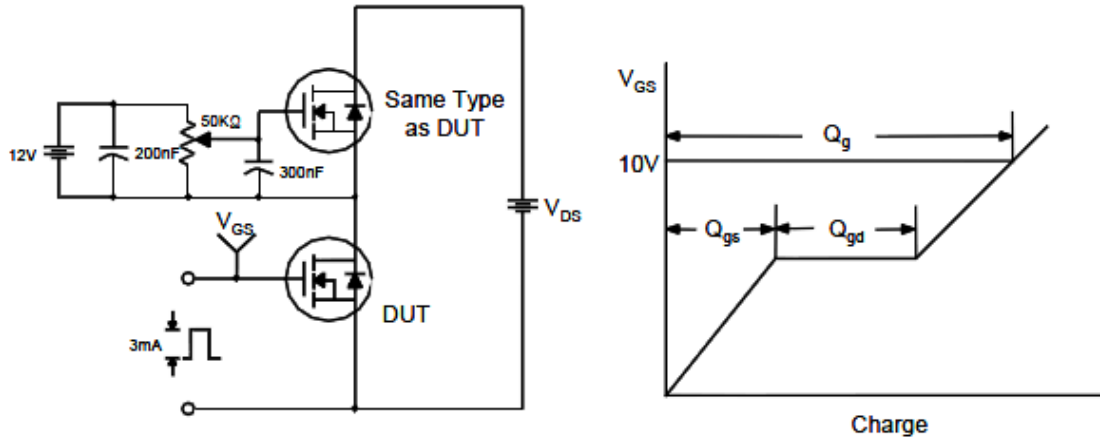


Typical Performance Characteristics (continue)

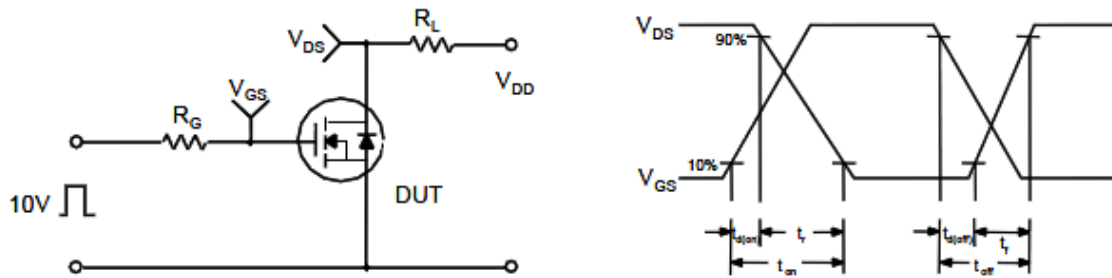


Typical Characteristics

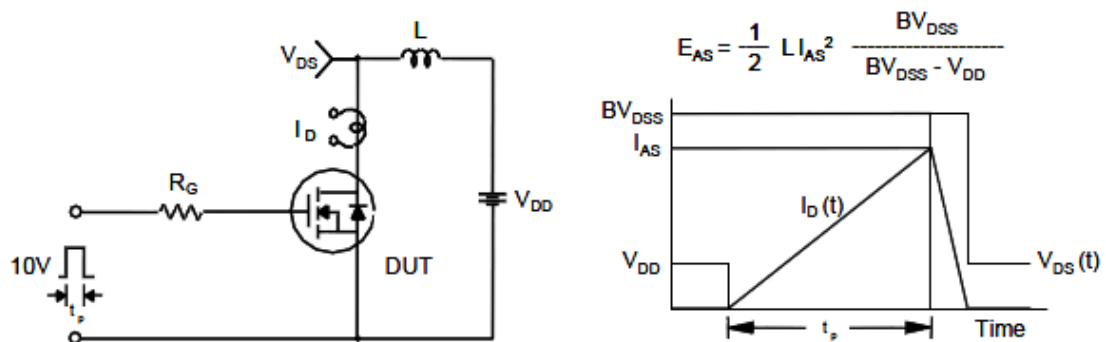
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

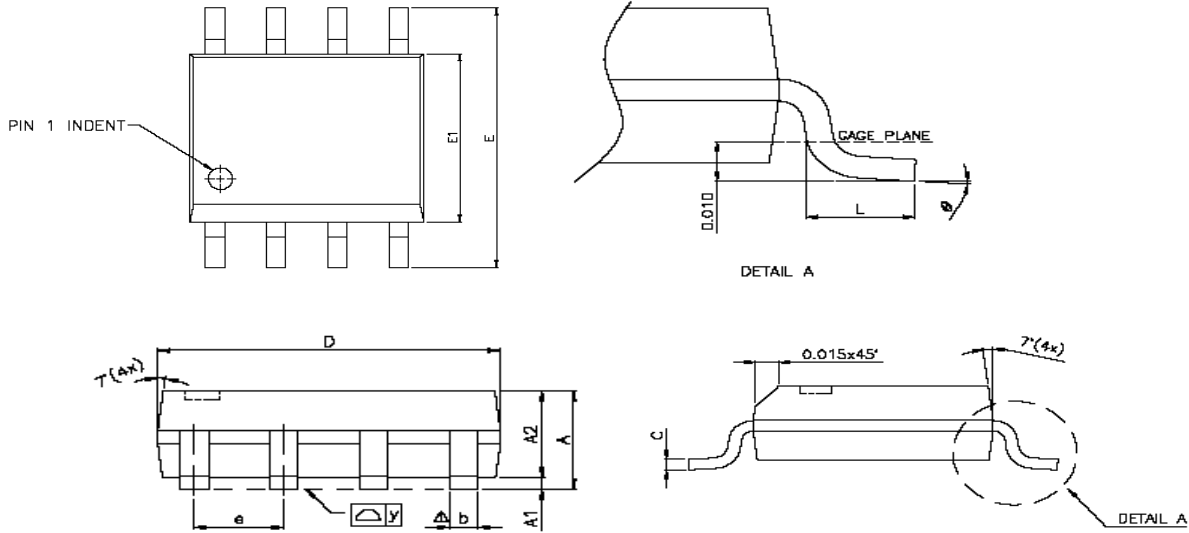


Unclamped Inductive Switching Test Circuit & Waveforms



Package Dimension

SOP-8P PLASTIC PACKAGE







Dimensions						
SYMBOL	Millimeters			Inches		
	MIN	NOM	MAX	MIN	NOM	MAX
A	1.47	1.60	1.73	0.058	0.063	0.068
A1	0.10	-	0.25	0.004	-	0.010
A2	-	1.45	-	-	0.057	-
b	0.33	0.41	0.51	0.013	0.016	0.020
C	0.19	0.20	0.25	0.0075	0.008	0.0098
D	4.80	4.85	4.95	0.189	0.191	0.195
E	5.80	6.00	6.20	0.228	0.236	0.244
E1	3.80	3.90	4.00	0.150	0.154	0.157
e	-	1.27	-	-	0.050	-
L	0.38	0.71	1.27	0.015	0.028	0.050
Δy	-	-	0.076	-	-	0.003
θ	0°	-	8°	0°	-	8°


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