

GSM9971

60V N-Channel Enhancement Mode MOSFET

Product Description

GSM9971, 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.

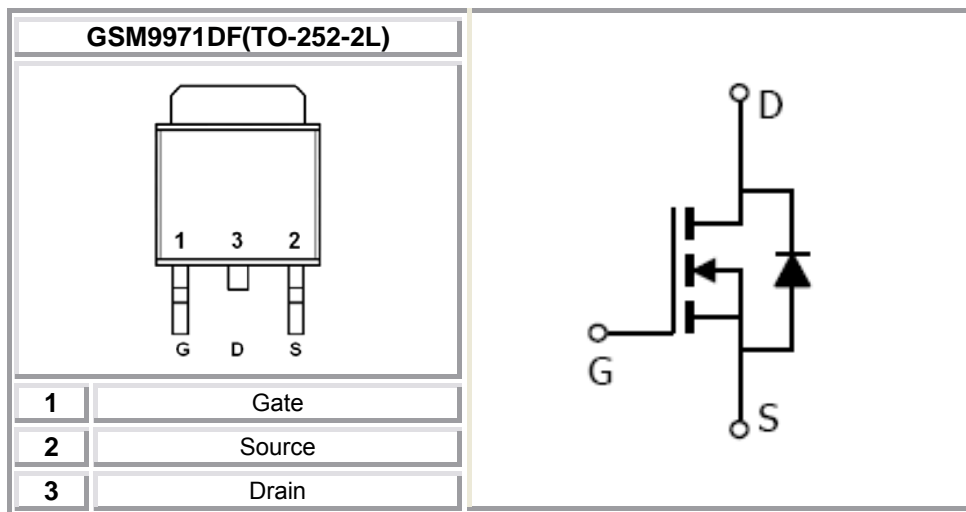
Features

- 60V/18A, $R_{DS(ON)} = 42m\Omega @ V_{GS} = 10V$
- 60V/12A, $R_{DS(ON)} = 50m\Omega @ V_{GS} = 4.5V$
- Super high density cell design for extremely low $R_{DS(ON)}$
- TO-252-2L package design

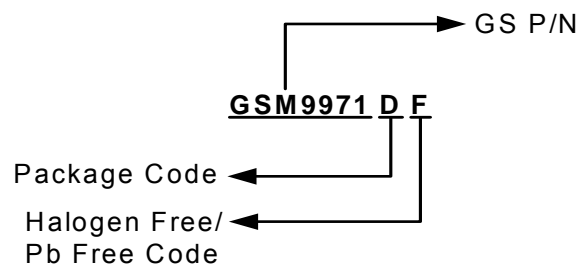
Applications

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

Packages & Pin Assignments

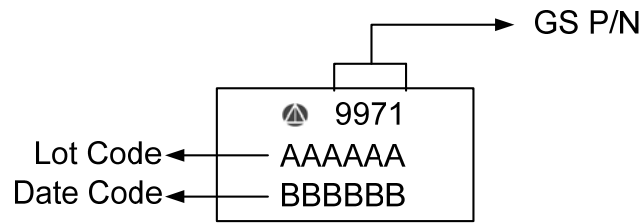


Ordering Information



Part Number	Package	Quantity Reel
GSM9971DF	TO-252-2L	2500 PCS

Marking Information



Absolute Maximum Ratings

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

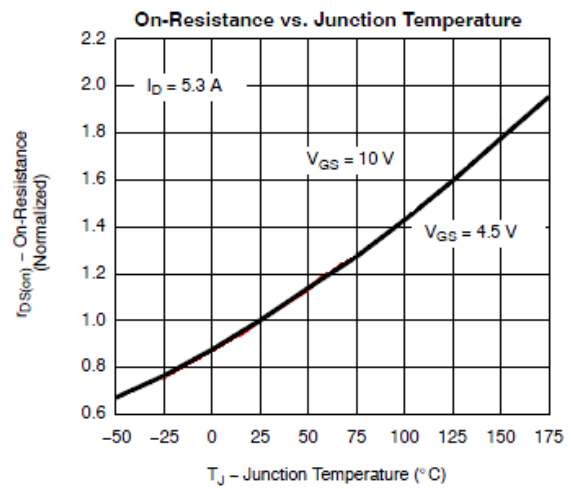
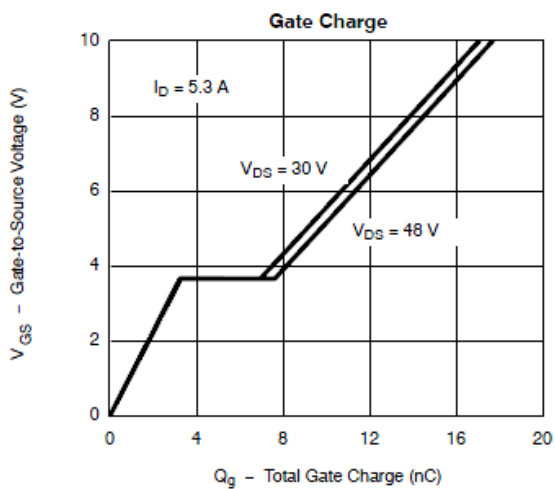
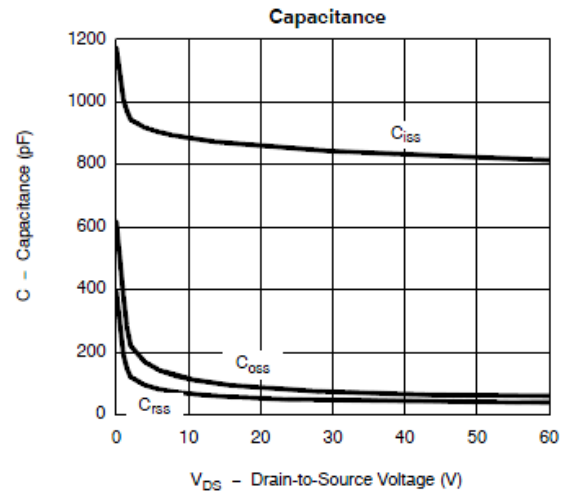
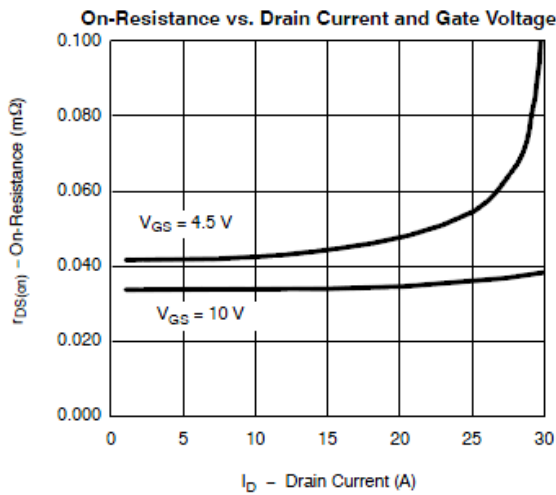
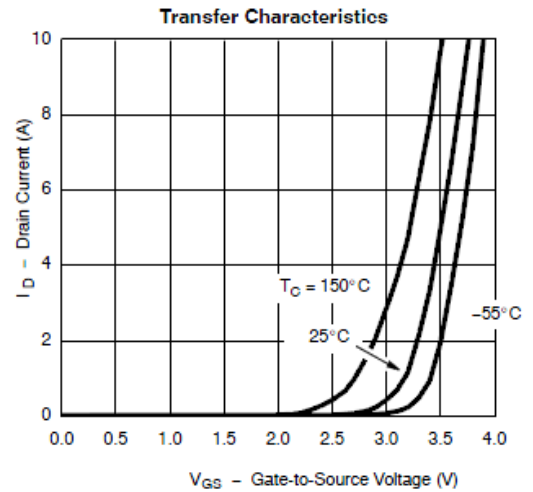
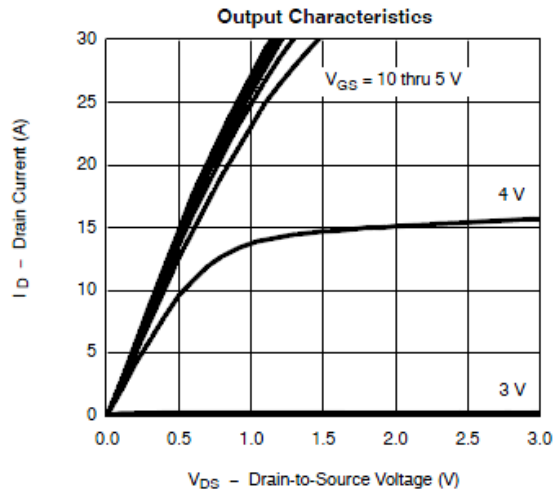
Symbol	Parameter	Typical	Unit	
V_{DSS}	Drain-Source Voltage	60	V	
V_{GSS}	Gate -Source Voltage	± 20	V	
I_D	Continuous Drain Current($T_J=150^\circ\text{C}$)	$T_A=25^\circ\text{C}$	25	A
		$T_A=70^\circ\text{C}$	16	
I_{DM}	Pulsed Drain Current	60	A	
I_S	Continuous Source Current(Diode Conduction)	12	A	
I_{AS}	Single Pulse Avalanche Current	15	A	
P_D	Power Dissipation	$T_A=25^\circ\text{C}$	40	W
		$T_A=70^\circ\text{C}$	15	
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	62.5	$^\circ\text{C}/\text{W}$	

Electrical Characteristics

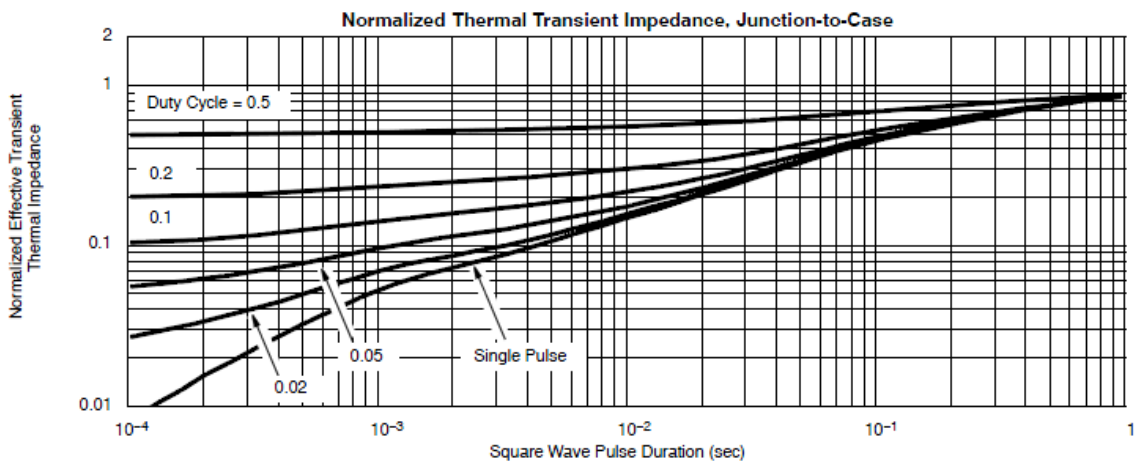
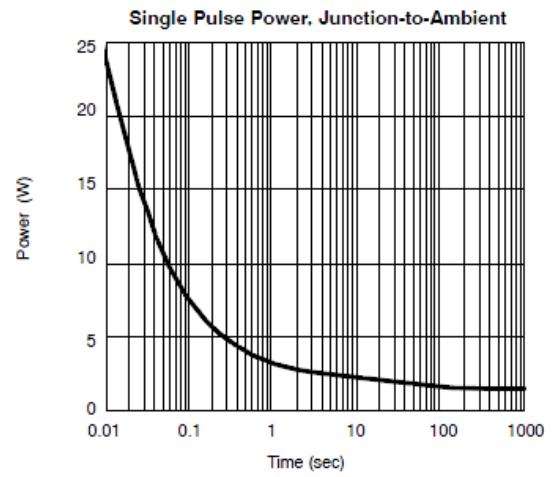
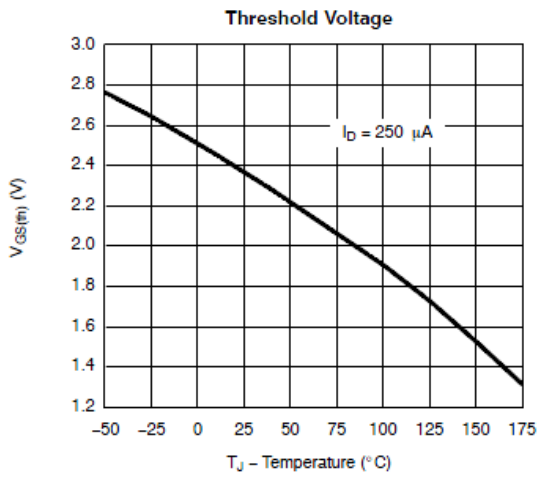
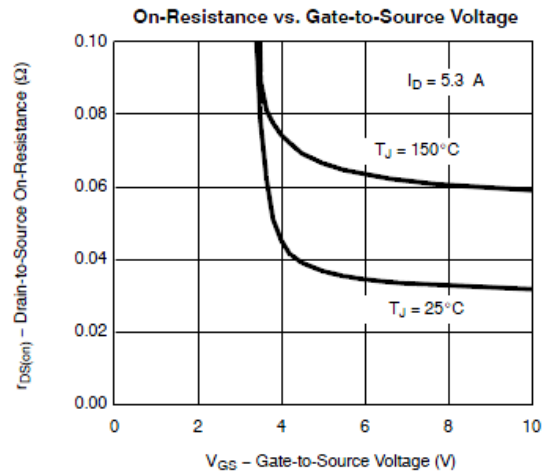
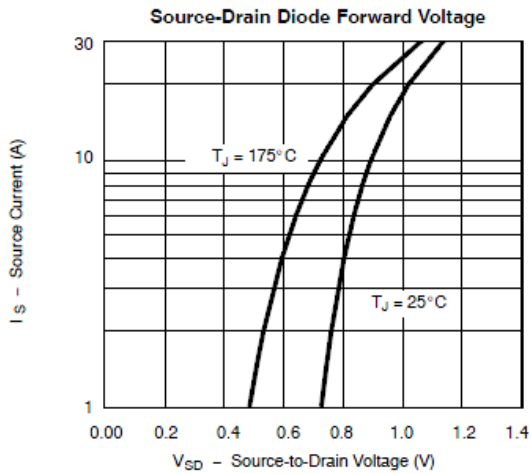
($T_A=25^\circ\text{C}$ unless otherwise noted)

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	uA
		$V_{DS}=60V, V_{GS}=0V$ $T_J=85^\circ\text{C}$			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						
Q_g	Total Gate Charge	$V_{DS}=30V, V_{GS}=5V$ $I_D=5.6A$		10	15	nC
Q_{gs}	Gate-Source Charge			3.5		
Q_{gd}	Gate-Drain Charge			3.6		
C_{iss}	Input Capacitance	$V_{DS}=30V, V_{GS}=0V$ $f=1\text{MHz}$		890		pF
C_{oss}	Output Capacitance			85		
C_{rss}	Reverse Transfer Capacitance			48		
$t_{d(on)}$	Turn-On Time	$V_{DD}=30V, R_L=6.8\Omega$ $I_D=5.0A, V_{GEN}=4.5V$ $R_G=6\Omega$		10	15	ns
t_r				12	20	
$t_{d(off)}$	Turn-Off Time			25	35	
t_f				10	15	

Typical Performance Characteristics

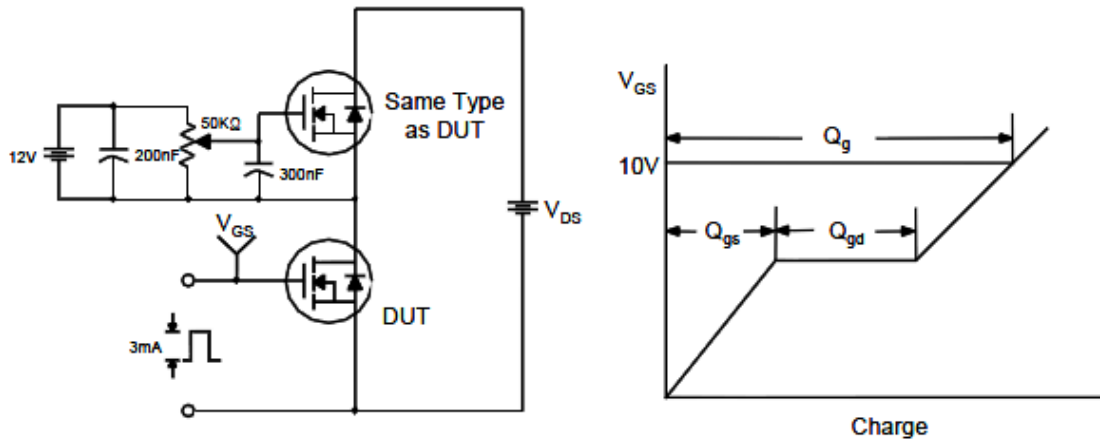


Typical Performance Characteristics (continue)

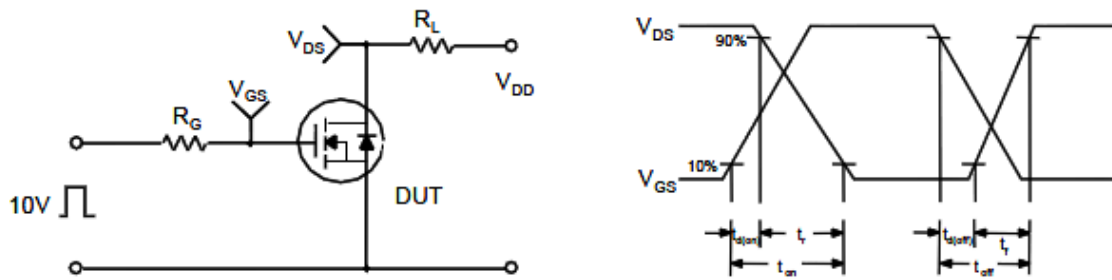


Typical Characteristics

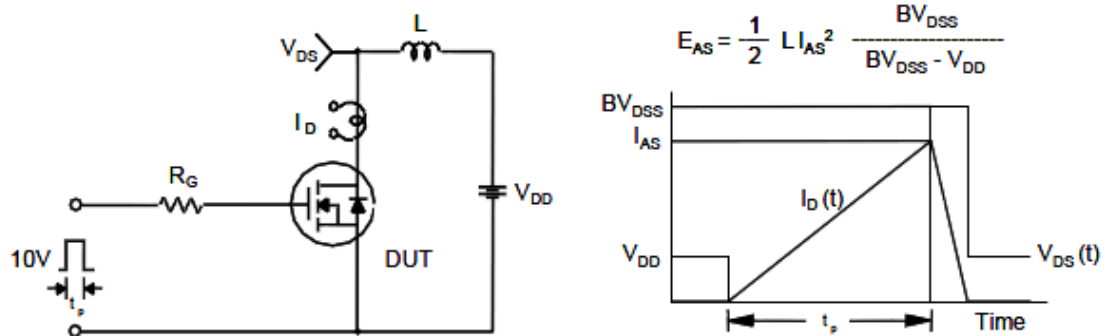
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

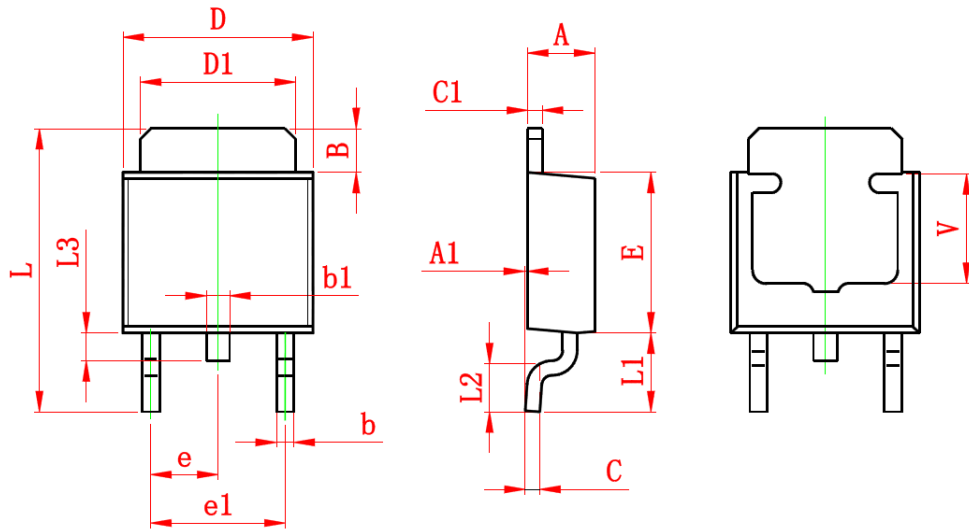


Unclamped Inductive Switching Test Circuit & Waveforms



Package Dimension

TO-252-2L PLASTIC PACKAGE







Dimensions				
SYMBOL	Millimeters		Inches	
	MIN	MAX	MIN	MAX
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
B	1.350	1.650	0.053	0.065
b	0.500	0.700	0.020	0.028
b1	0.700	0.900	0.028	0.035
c	0.430	0.580	0.017	0.023
c1	0.430	0.580	0.017	0.023
D	6.350	6.650	0.250	0.262
D1	5.200	5.400	0.205	0.213
E	5.400	5.700	0.213	0.224
e	2.300 TYP		0.091 TYP	
e1	4.500	4.700	0.177	0.185
L	9.500	9.900	0.374	0.390
L1	2.550	2.900	0.100	0.114
L2	1.400	1.780	0.055	0.070
L3	0.600	0.900	0.024	0.035
V	3.800 REF		0.150 REF	



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