

# GSM6820

## 20V N-Channel Enhancement Mode MOSFET

### Product Description

GSM6820, 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

- 20V/3.4A,  $R_{DS(ON)}=58m\Omega@V_{GS}=4.5V$
- 20V/3.0A,  $R_{DS(ON)}=68m\Omega@V_{GS}=2.5V$
- 20V/2.4A,  $R_{DS(ON)}=88m\Omega@V_{GS}=1.8V$
- Super high density cell design for extremely low  $R_{DS(ON)}$
- TSOP-6 package design

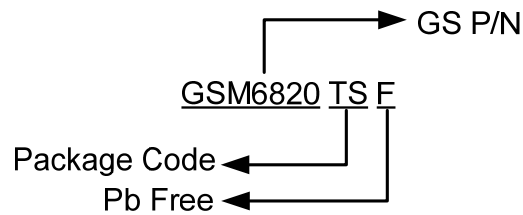
### Applications

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

### Packages & Pin Assignments

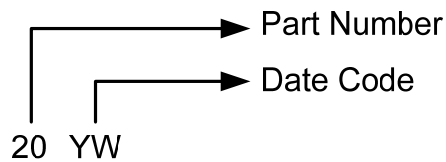
GSM6820TSF(TSOP-6)	
Pin	Description
1	Gate 1
2	Source 2
3	Gate 2
4	Drain 2
5	Source 1
6	Drain 1

## Ordering Information



Part Number	Package	Quantity Reel
GSM6820TSF	TSOP-6	3000 PCS

## Marking Information



## Absolute Maximum Ratings

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

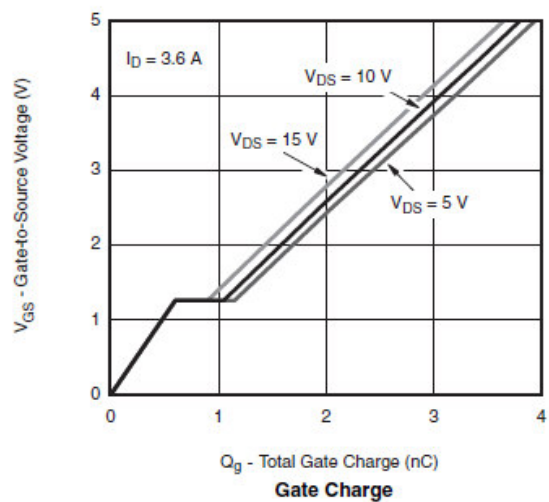
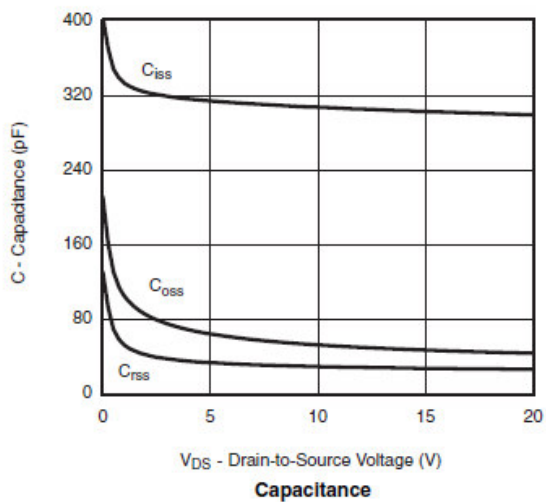
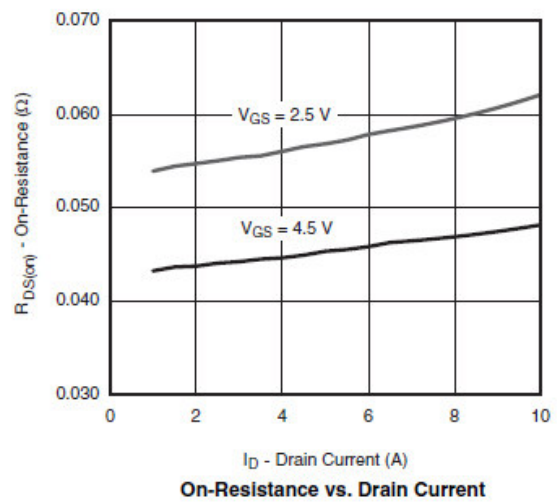
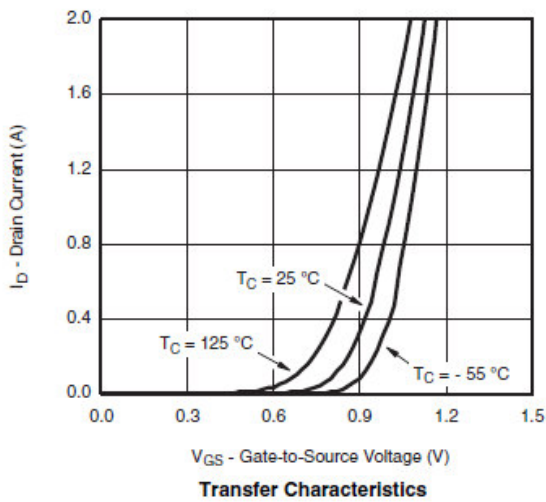
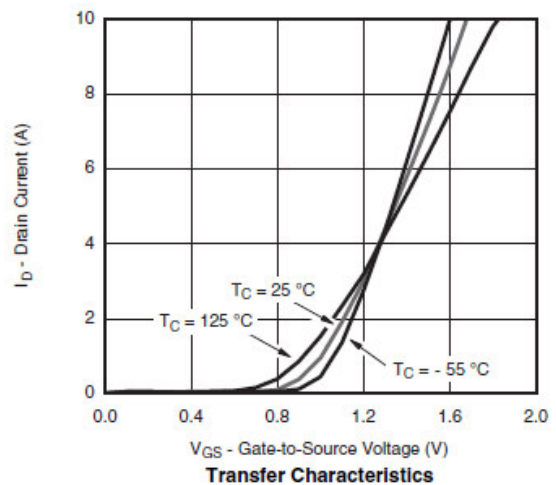
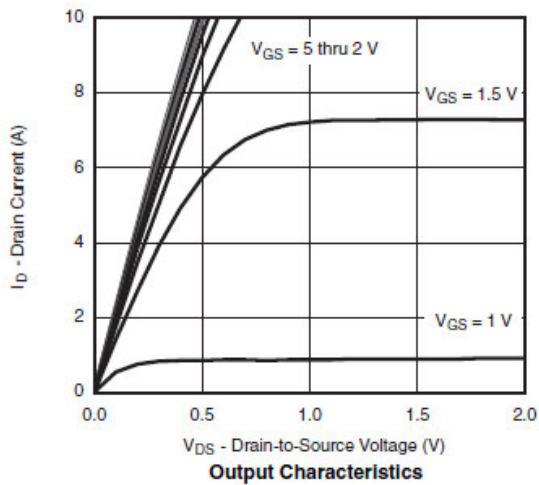
Symbol	Parameter	Typical	Unit	
$V_{DSS}$	Drain-Source Voltage	20	V	
$V_{GSS}$	Gate-Source Voltage	$\pm 12$	V	
$I_D$	Continuous Drain Current( $T_J=150^{\circ}\text{C}$ )	$T_A=25^{\circ}\text{C}$	3.4	A
		$T_A=70^{\circ}\text{C}$	2.4	
$I_{DM}$	Pulsed Drain Current	20	A	
$I_S$	Continuous Source Current(Diode Conduction)	1.7	A	
$P_D$	Power Dissipation	$T_A=25^{\circ}\text{C}$	2.0	W
		$T_A=70^{\circ}\text{C}$	1.3	
$T_J$	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

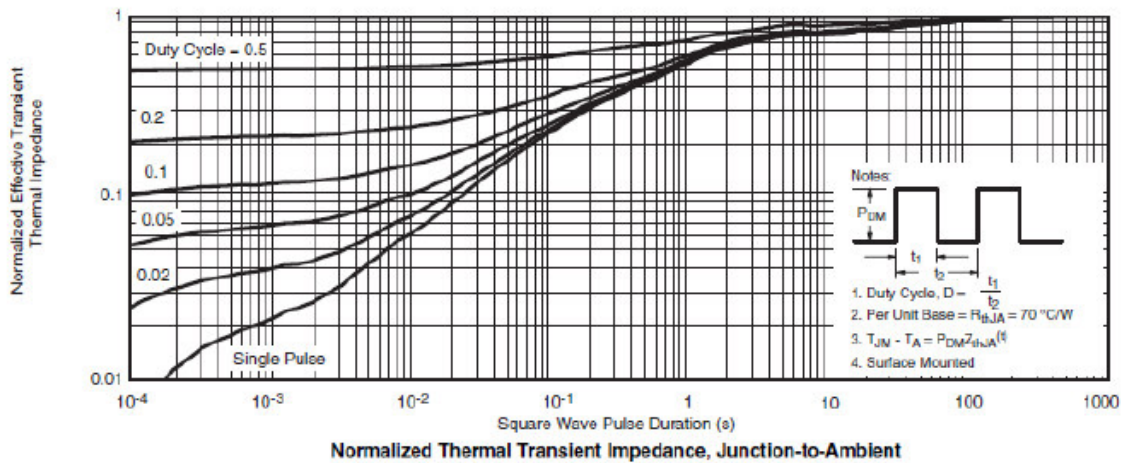
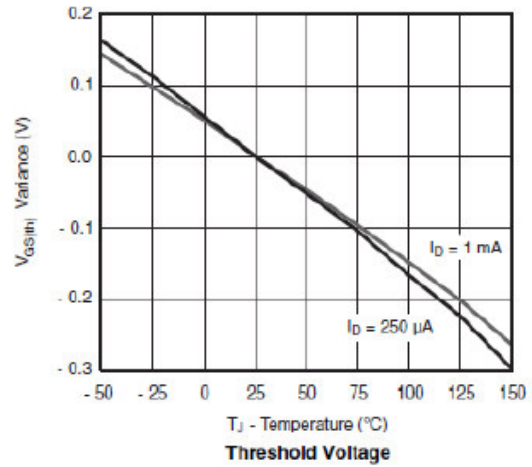
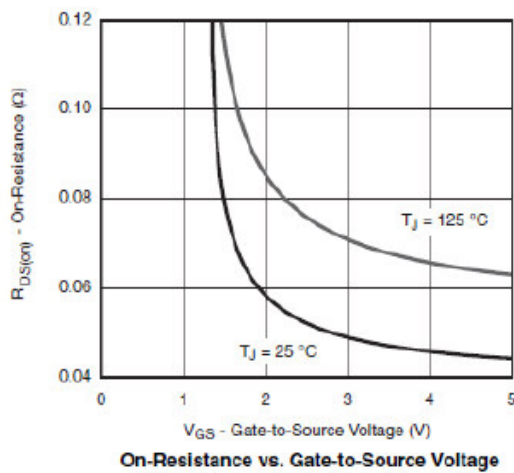
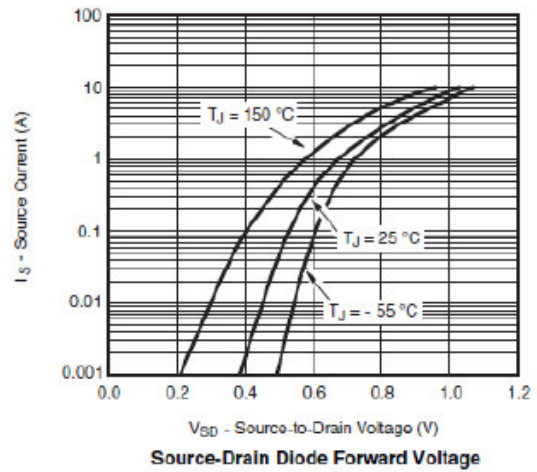
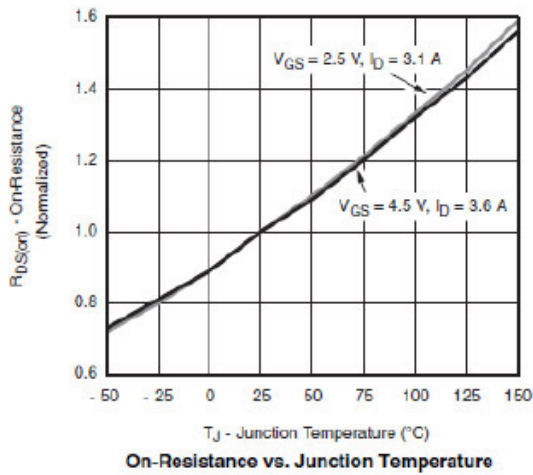
T<sub>A</sub>=25°C, unless otherwise noted

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> =250μA	20			V
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	0.3		0.8	
I <sub>GSS</sub>	Gate Leakage Current	V <sub>DS</sub> =0V, V <sub>GS</sub> =±12V			±100	nA
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =16V, V <sub>GS</sub> =0V			1	μA
		V <sub>DS</sub> =16V, 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
		V <sub>DS</sub> ≥5V, V <sub>GS</sub> =2.5V	4			
R <sub>DS(on)</sub>	Drain-Source On-Resistance	V <sub>GS</sub> =4.5V, I <sub>D</sub> =3.4A		46	58	mΩ
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =3.0A		56	68	
		V <sub>GS</sub> =1.8V, I <sub>D</sub> =2.4A		76	88	
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> =5V, I <sub>D</sub> =3.6A		10		S
V <sub>SD</sub>	Diode Forward Voltage	I <sub>S</sub> =1.6A, V <sub>GS</sub> =0V		0.85	1.2	V
<b>Dynamic</b>						
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =10V, V <sub>GS</sub> =4.5V, I <sub>D</sub> =3.6A		4.2	5.0	nC
Q <sub>gs</sub>	Gate-Source Charge			0.6		
Q <sub>gd</sub>	Gate-Drain Charge			0.4		
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =10V, V <sub>GS</sub> =0V, f=1MHz		340		pF
C <sub>oss</sub>	Output Capacitance			115		
C <sub>rss</sub>	Reverse Transfer Capacitance			33		
t <sub>d(on)</sub>	Turn-On Time	V <sub>DD</sub> =10V, R <sub>L</sub> =2.8Ω, I <sub>D</sub> =3.6A, V <sub>GEN</sub> =4.5V, R <sub>G</sub> =1Ω		8	15	ns
t <sub>r</sub>				8	15	
t <sub>d(off)</sub>	Turn-Off Time			25	40	
t <sub>f</sub>				8	15	

## Typical Performance Characteristics

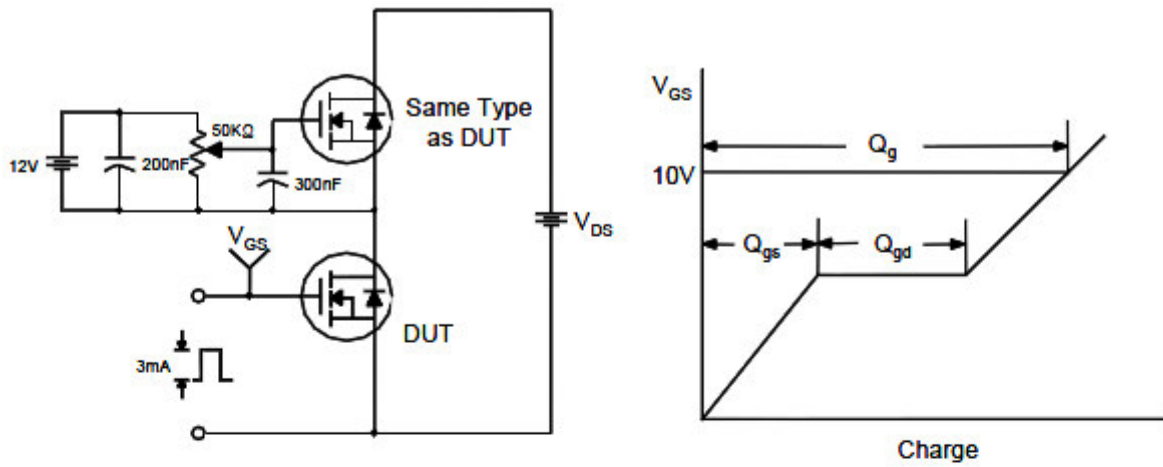


## Typical Performance Characteristics (continue)

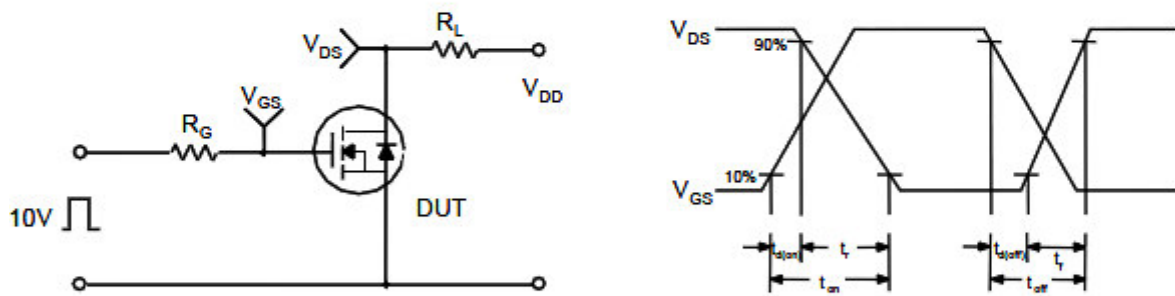


## Typical Performance Characteristics (continue)

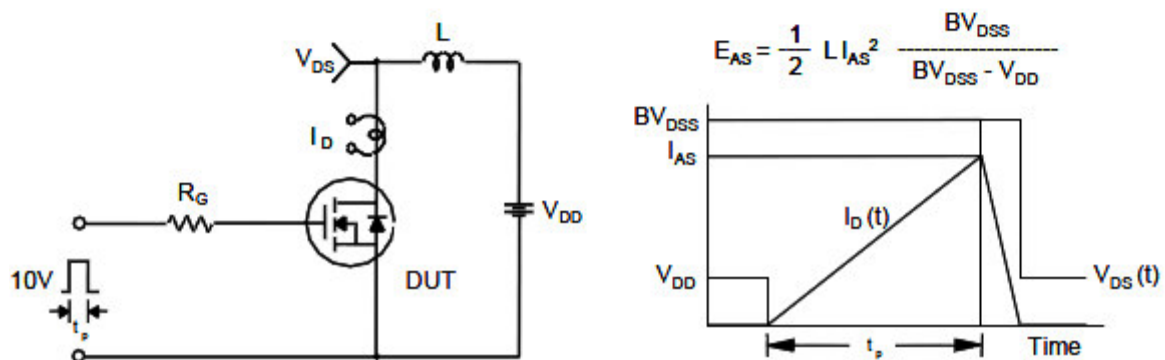
### Gate Charge Test Circuit & Waveform



### Resistive Switching Test Circuit & Waveforms

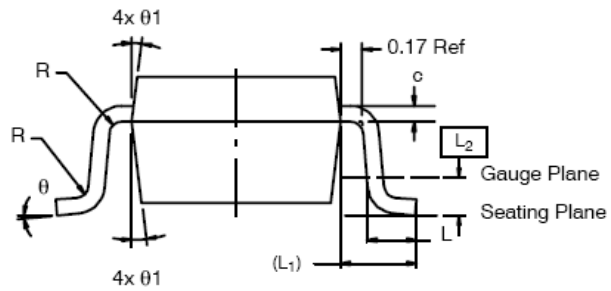
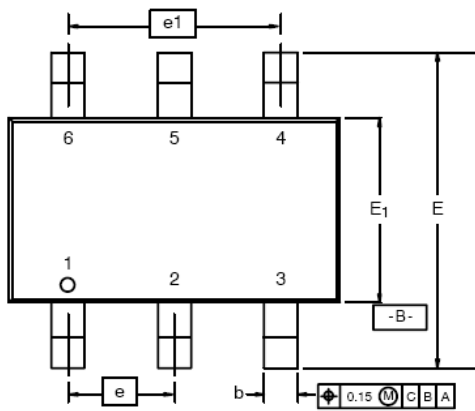


### Unclamped Inductive Switching Test Circuit & Waveforms



## Package Dimension

# TSOP-6







Symbol	Dimensions In Millimeters			Dimensions In Inches		
	Min	Nom	Max	Min	Nom	Max
<b>A</b>	0.91	-	1.10	0.036	-	0.043
<b>A1</b>	0.01	-	0.10	0.0004	-	0.004
<b>A2</b>	0.90	-	1.00	0.035	0.038	0.039
<b>b</b>	0.30	0.32	0.45	0.012	0.013	0.018
<b>c</b>	0.10	0.15	0.20	0.004	0.006	0.008
<b>D</b>	2.95	3.05	3.10	0.116	0.120	0.122
<b>E</b>	2.70	2.85	2.98	0.106	0.112	0.117
<b>E1</b>	1.55	1.65	1.70	0.061	0.065	0.067
<b>e</b>	1.00 BSC			0.0394 BSC		
<b>e1</b>	1.90	2.00	2.10	0.075	0.080	0.085
<b>L</b>	0.35	-	0.50	0.014	-	0.020
<b>L1</b>	0.60 Ref			0.024 Ref		
<b>L2</b>	0.25 BSC			0.010 BSC		
<b>R</b>	0.10	-	-	0.004	-	-
<b>θ</b>	0°	4°	8°	0°	4°	8°
<b>θ1</b>	7° Nom			7° Nom		



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