

# GSM6405

## 30V P-Channel Enhancement Mode MOSFET

### Product Description

GSM6405TSF, 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.

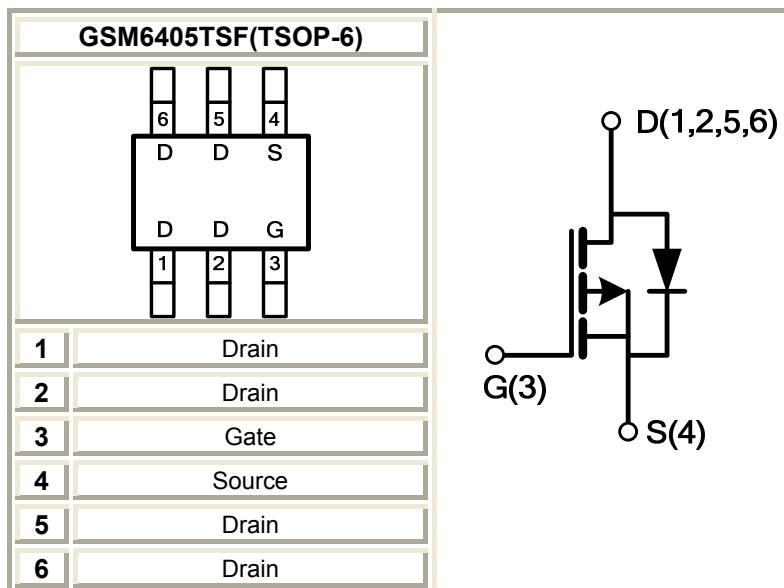
### Features

- -30V/-5.0A,  $R_{DS(ON)}=55m\Omega@VGS=-10.0V$
- -30V/-4.0A,  $R_{DS(ON)}=85m\Omega@VGS=-4.5V$
- Super high density cell design for extremely low  $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- TSOP-6 package design

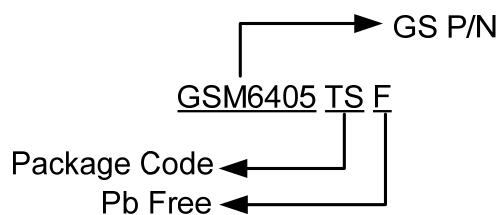
### Applications

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

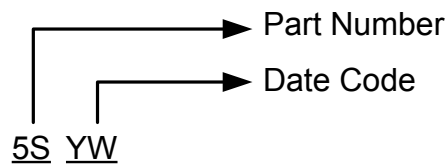
### Packages & Pin Assignments



### Ordering Information



## Marking Information



Part Number	Package	Part Marking
GSM6405TSF	TSOP-6	5SYW

## Absolute Maximum Ratings

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

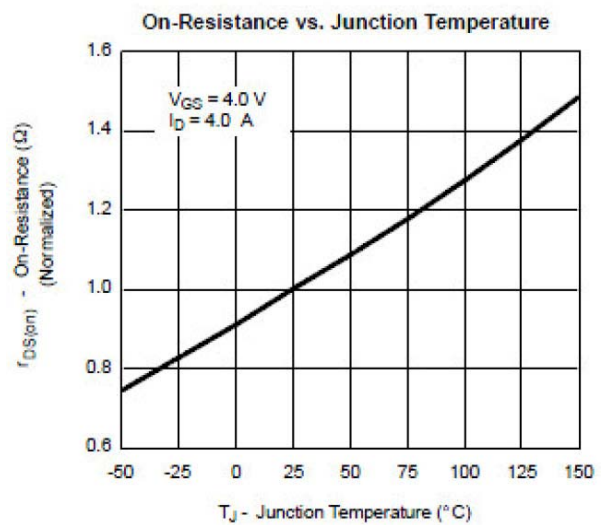
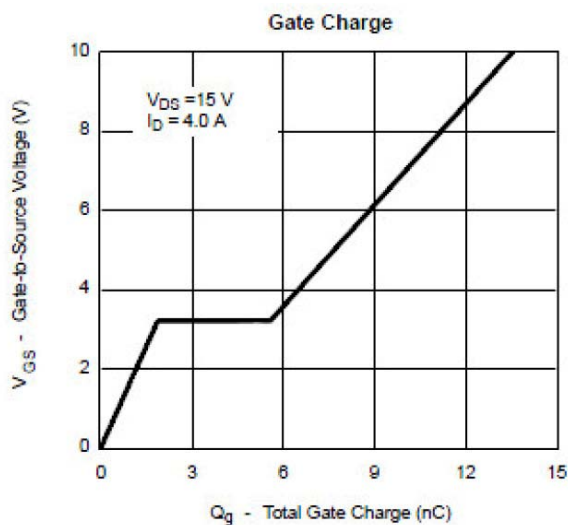
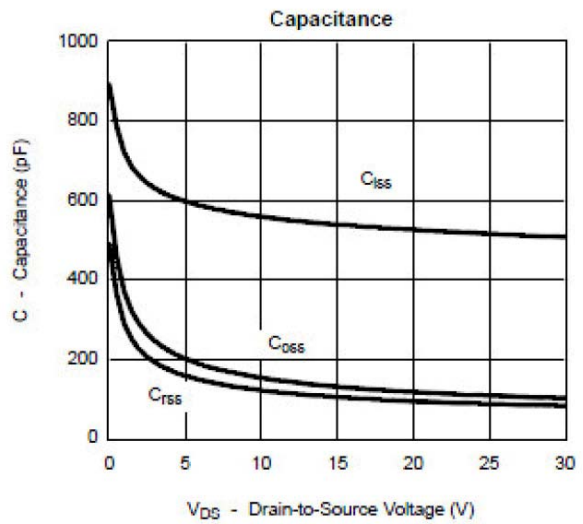
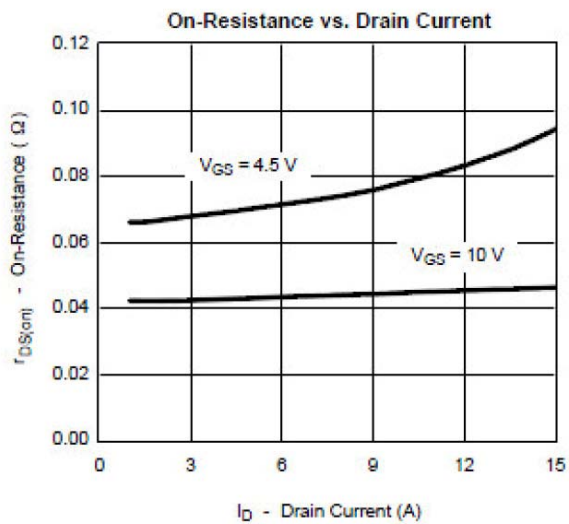
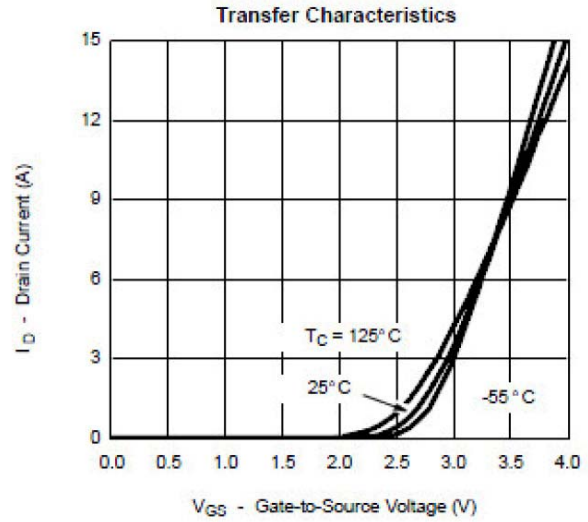
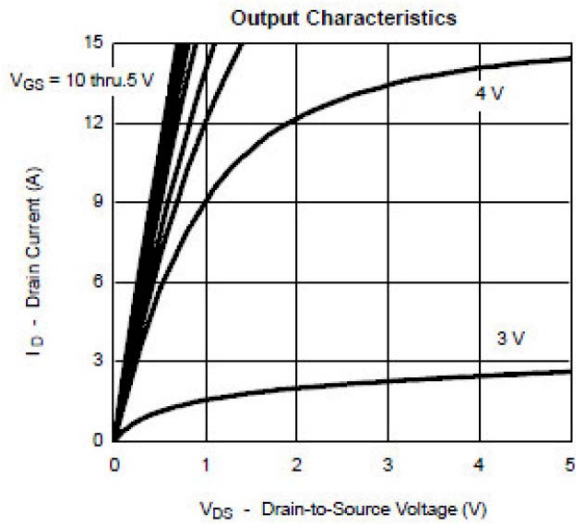
Symbol	Parameter	Typical	Unit	
V <sub>DSS</sub>	Drain-Source Voltage	-30	V	
V <sub>GSS</sub>	Gate –Source Voltage	±20	V	
I <sub>D</sub>	Continuous Drain Current(T <sub>J</sub> =150°C)	T <sub>A</sub> =25°C	-5.0	A
		T <sub>A</sub> =70°C	-4.0	
I <sub>DM</sub>	Pulsed Drain Current	-20	A	
I <sub>S</sub>	Continuous Source Current(Diode Conduction)	-1.7	A	
P <sub>D</sub>	Power Dissipation	T <sub>A</sub> =25°C	2.0	W
		T <sub>A</sub> =70°C	1.3	
T <sub>J</sub>	Operating Junction Temperature	150	°C	
T <sub>STG</sub>	Storage Temperature Range	-55/150	°C	
R <sub>θJA</sub>	Thermal Resistance-Junction to Ambient	120	°C/W	

## Electrical Characteristics

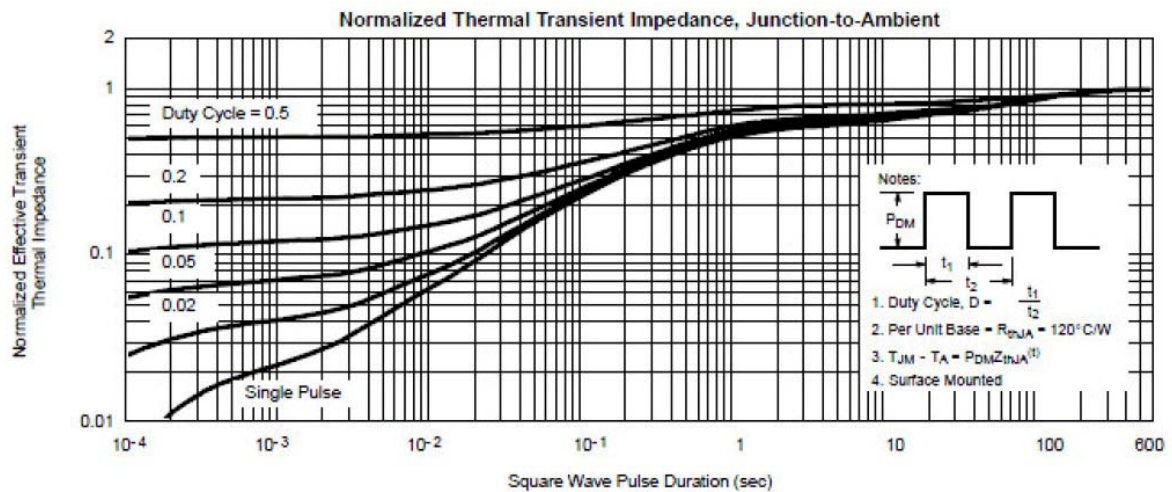
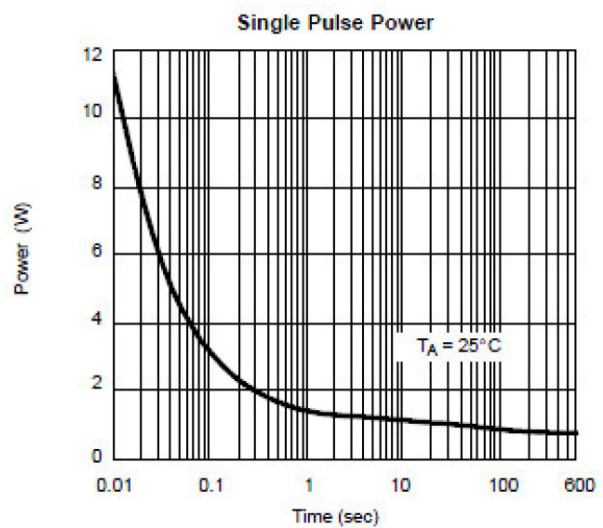
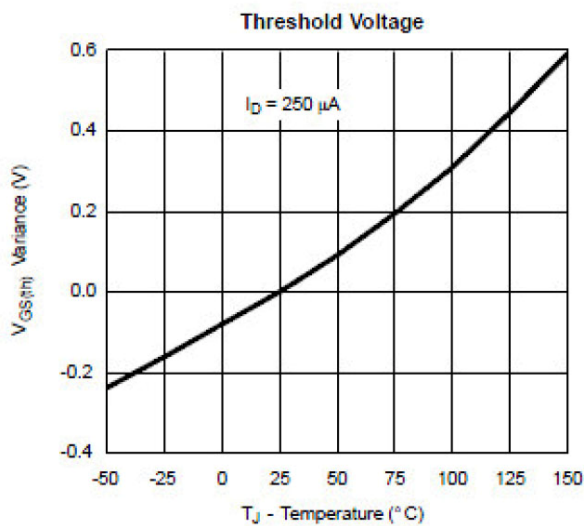
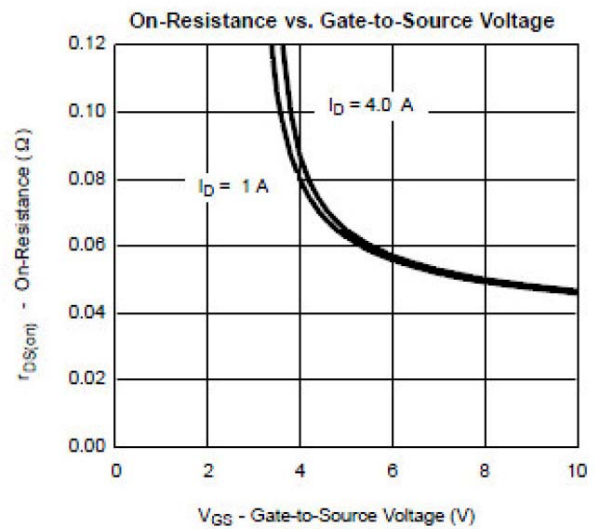
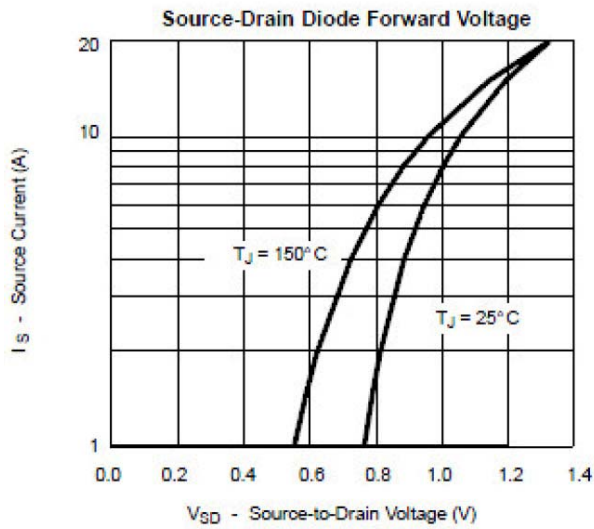
TA=25°C, unless otherwise noted

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Static</b>						
$V_{(BR)DSS}$	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		-2.5	
$I_{GSS}$	Gate Leakage Current	$V_{DS}=0V, V_{GS}=\pm 12V$			$\pm 100$	nA
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=-24V, V_{GS}=0V$			-1	uA
		$V_{DS}=-24V, V_{GS}=0V, T_J=85^\circ C$			-30	
$I_{D(on)}$	On-State Drain Current	$V_{DS} \leq -5V, V_{GS}=-10V$	-10			A
$R_{DS(on)}$	Drain-Source On-Resistance	$V_{GS}=-10V, I_D=-5.0A$		48	55	mΩ
		$V_{GS}=-4.5V, I_D=-4.0A$		75	85	
$g_{FS}$	Forward Transconductance	$V_{DS}=-5.0V, I_D=-4.0A$		10		S
$V_{SD}$	Diode Forward Voltage	$I_S=-1.7A, V_{GS}=0V$		-0.7	-1.3	V
<b>Dynamic</b>						
$Q_g$	Total Gate Charge	$V_{DS}=-15V, V_{GS}=-10V, I_D=-3.5A$		10	18	nC
$Q_{gs}$	Gate-Source Charge			1.6		
$Q_{gd}$	Gate-Drain Charge			3.0		
$C_{iss}$	Input Capacitance	$V_{DS}=-15V, V_{GS}=0V, f=1MHz$		450		pF
$C_{oss}$	Output Capacitance			95		
$C_{rss}$	Reverse Transfer Capacitance			55		
$t_{d(on)}$	Turn-On Time	$V_{DD}=-15V, R_L=15\Omega, I_D=-1.0A, V_{GEN}=-10V, R_G=6\Omega$		8	18	ns
$t_r$				8	18	
$t_{d(off)}$	Turn-Off Time			25	50	
$t_f$				25	35	

## Typical Performance Characteristics

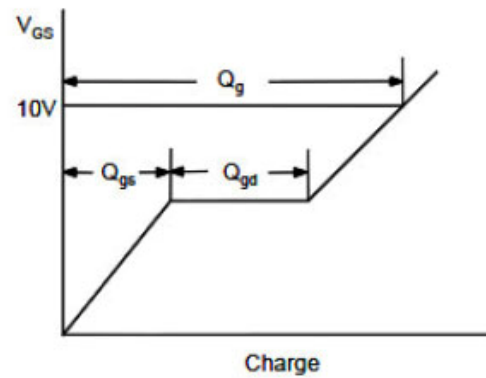
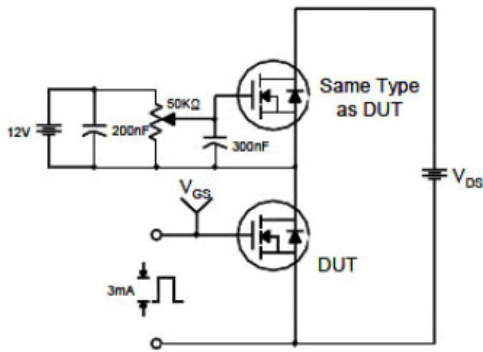


## Typical Performance Characteristics(Continue)

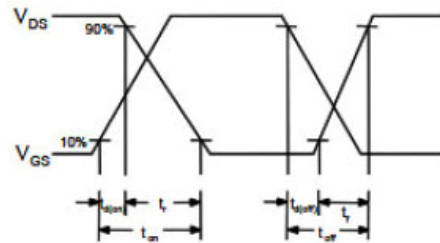
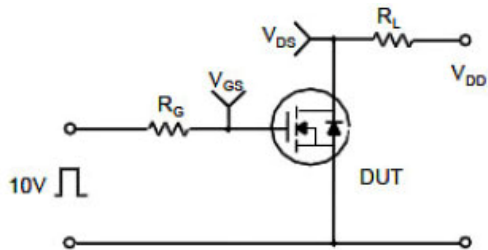


## Typical Performance Characteristics(Continue)

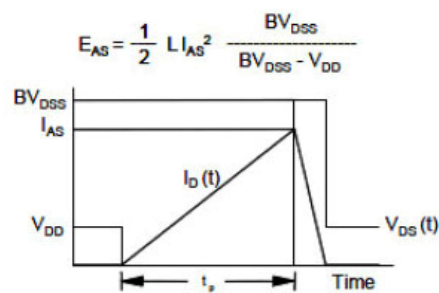
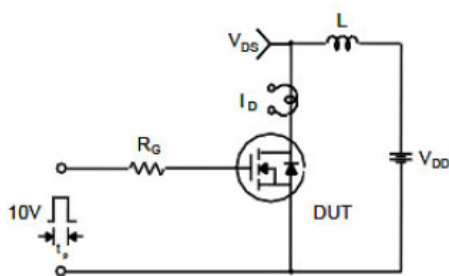
### Gate Charge Test Circuit & Waveform



### Resistive Switching Test Circuit & Waveforms

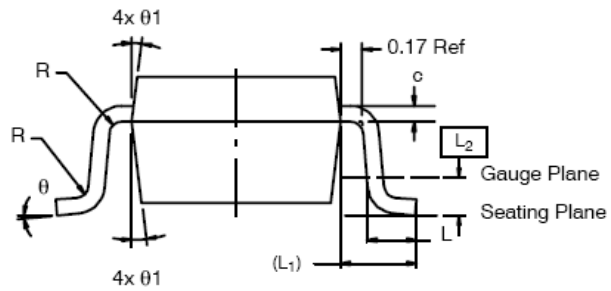
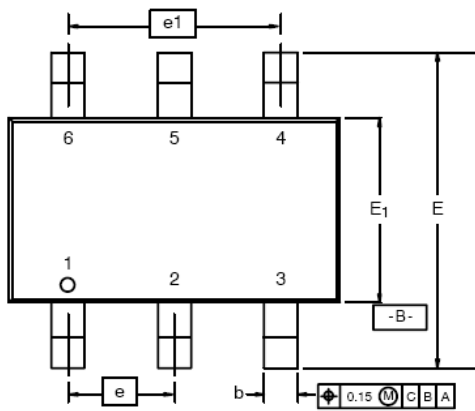


### Unclamped Inductive Switching Test Circuit & Waveforms



## 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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## CONTACT US

GS Headquarter	
	4F.,No.43-1,Lane11,Sec.6,Minquan E.Rd NeiHu District Taipei City 114, Taiwan (R.O.C)
	886-2-2657-9980
	886-2-2657-3630
	sales_twn@gs-power.com

Wu-Xi Branch	
	No.21 Changjiang Rd., WND, Wuxi, Jiangsu, China (INFO. & TECH. Science Park Building A 210 Room)
	86-510-85217051
	86-510-85211238
	sales_cn@gs-power.com

RD Division	
	824 Bolton Drive Milpitas. CA. 95035
	1-408-457-0587