

# GSM3825EX7F

## 30V P-Channel Enhancement Mode MOSFET

### Product Description

GSM3825EX7F, 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, such as smart phone and notebook computer, and low in-line power loss are needed in commercial industrial surface mount applications.

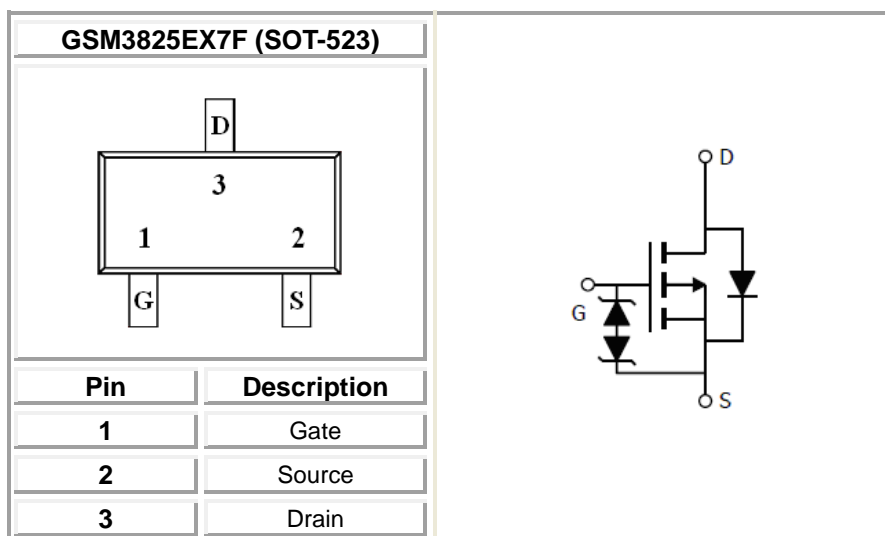
### Features

- -30V/-0.27A,  $R_{DS(ON)}=2500m\Omega@V_{GS}=-4.5V$   
 $R_{DS(ON)}=2900m\Omega@V_{GS}=-2.5V$   
 $R_{DS(ON)}=5000m\Omega@V_{GS}=-1.8V$
- Low-Voltage Operation
- High-Speed Circuits
- ESD Protection
- SOT-523 package design

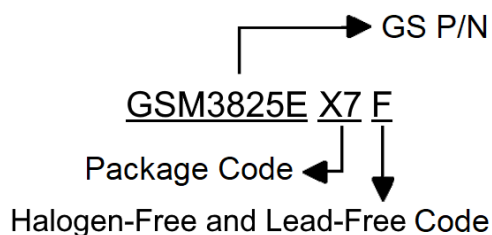
### Applications

- Drivers : Relays, Solenoids, Lamps, Hammers
- Battery Operated Systems
- Power Supply Converter Circuits
- Load/Power Switching Smart Phones, Pagers

### Packages & Pin Assignments

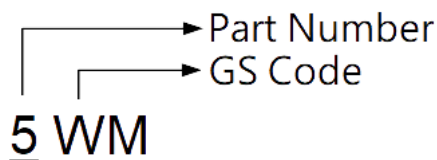


## Ordering Information



Part Number	Package	Quantity Reel
GSM3825EX7F	SOT-523	3000 PCS

## Marking Information



## 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	±10	V
I <sub>D</sub>	Continuous Drain Current <sup>2</sup>	T <sub>A</sub> =25°C	-0.27
		T <sub>A</sub> =70°C	-0.22
I <sub>DM</sub>	Pulsed Drain Current	-1.2	A
P <sub>D</sub>	Power Dissipation <sup>2</sup>	T <sub>A</sub> =25°C	0.28
		T <sub>A</sub> =70°C	0.18
R <sub>θJA</sub>	Thermal Resistance Junction to ambient <sup>1</sup>	530	°C/W
R <sub>θJA</sub>	Thermal Resistance Junction to ambient <sup>2</sup>	450	°C/W
T <sub>J</sub>	Operating Junction Temperature Range	-55 to +150	°C
T <sub>STG</sub>	Storage Temperature Range	-55 to +150	°C

Note1. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.  
 Note2. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

## 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> =-250uA	-30			V
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250uA	-0.4		-1.0	
I <sub>GSS</sub>	Gate Leakage Current	V <sub>DS</sub> =0V, V <sub>GS</sub> =±8V			±10	uA
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =-24V, V <sub>GS</sub> =0V			-1	uA
R <sub>DS(on)</sub>	Drain-Source On-Resistance	V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-0.5A		1.45	2.5	Ω
		V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-0.2A		1.85	2.9	
		V <sub>GS</sub> =-1.8V, I <sub>D</sub> =-0.1A		2.4	5.0	
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> =10V, I <sub>D</sub> =0.25A		610		mS
V <sub>SD</sub>	Diode Forward Voltage	I <sub>S</sub> =-0.5A, V <sub>GS</sub> =0V			1.3	V
<b>Dynamic</b>						
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =-15V, V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-1A		1.0		nC
Q <sub>gs</sub>	Gate-Source Charge	V <sub>DS</sub> =-15V, V <sub>GS</sub> =-8V, I <sub>D</sub> =-1A		0.2		
Q <sub>gd</sub>	Gate-Drain Charge	V <sub>DS</sub> =-15V, V <sub>GS</sub> =-8V, I <sub>D</sub> =-1A		0.1		
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =-15V, V <sub>GS</sub> =0V f=1MHz		54		pF
C <sub>oss</sub>	Output Capacitance			10.9		
C <sub>rss</sub>	Reverse Transfer Capacitance			5.8		
t <sub>d(on)</sub>	Turn-On Time	V <sub>DD</sub> =-10V, R <sub>L</sub> =47Ω, I <sub>D</sub> =-0.2A V <sub>GEN</sub> =-4.5V, R <sub>G</sub> =10Ω		3.8		ns
t <sub>r</sub>				11		
t <sub>d(off)</sub>	Turn-Off Time			45		
t <sub>f</sub>				20		

## Typical Performance Characteristics

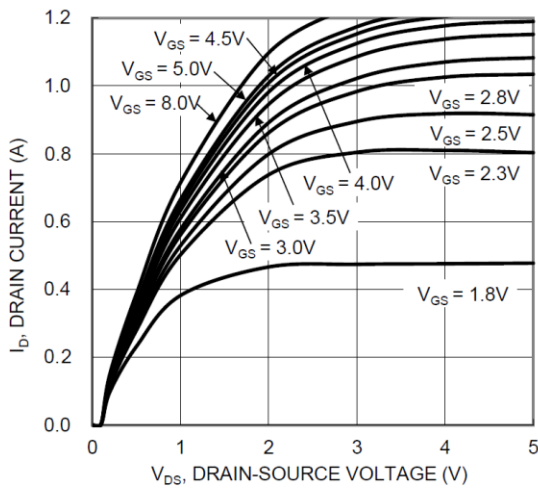


Fig. 1 Typical Output Characteristics

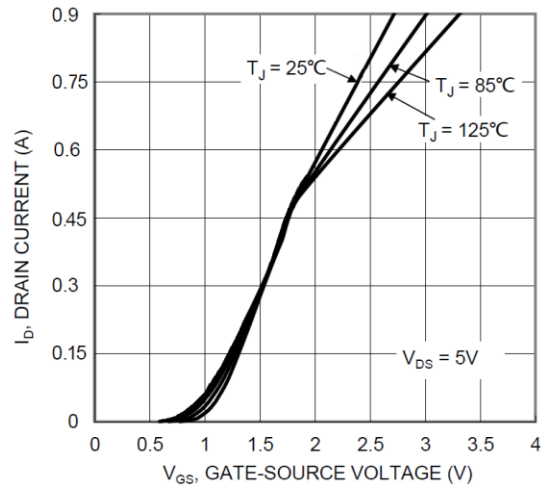


Fig. 2 Typical Transfer Characteristics

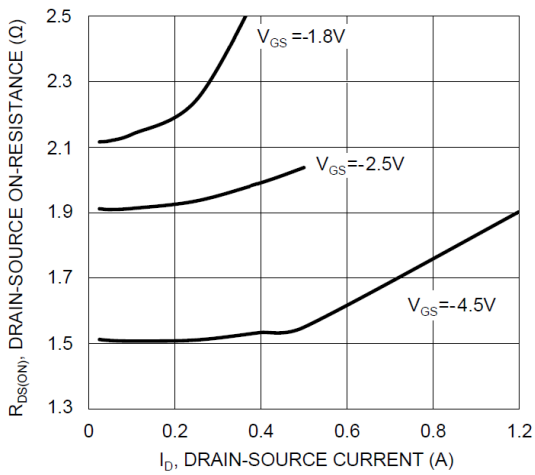


Fig. 3 Typical On-Resistance vs.  $I_D$  and  $V_{GS}$

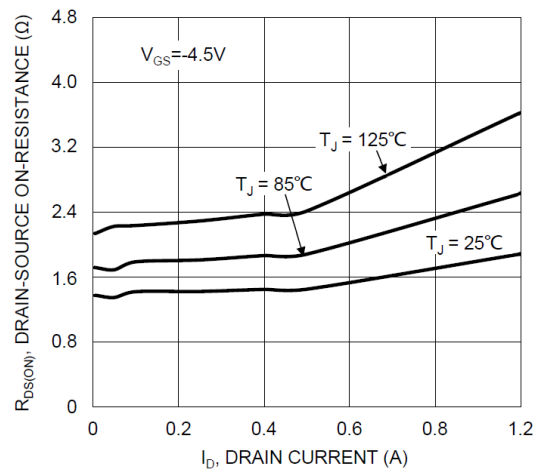


Fig. 4 Typical Drain-Source On-Resistance vs.  $I_D$  and  $T_J$

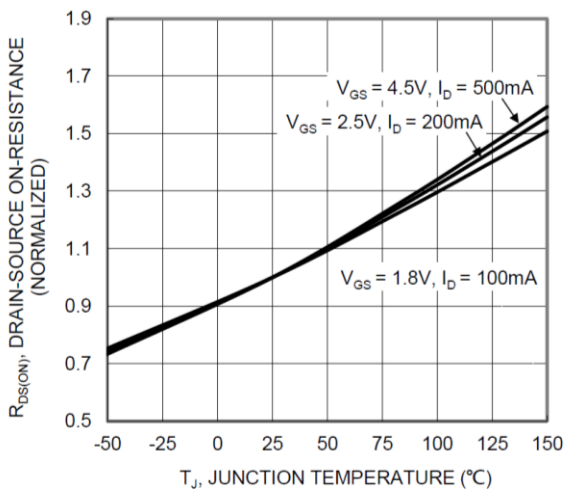


Fig. 5 On-Resistance Variation with  $T_J$

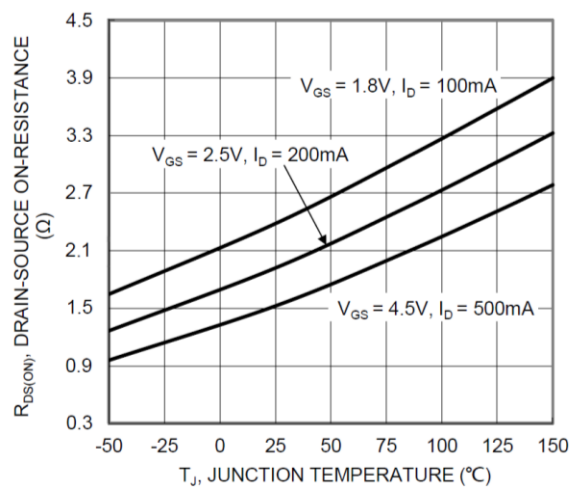


Fig. 6 On-Resistance Variation with  $T_J$

## Typical Performance Characteristics (continue)

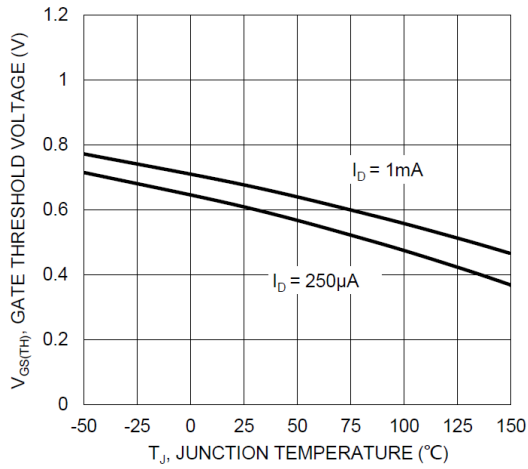


Fig. 7 Gate Threshold Variation vs.  $T_j$

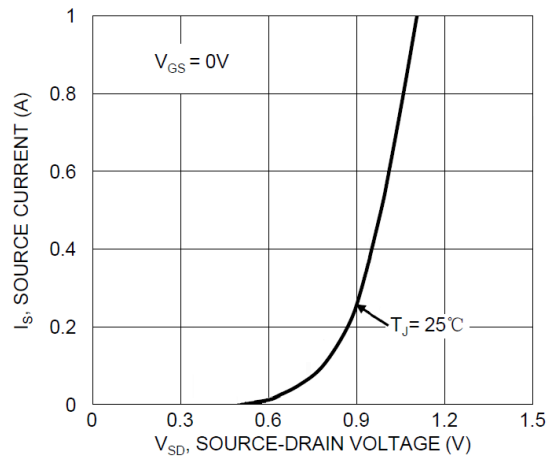


Fig. 8 Diode Forward Voltage vs. Current

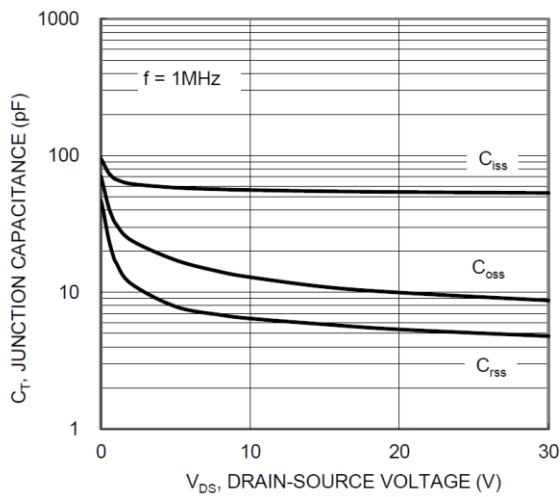


Fig. 9 Typical Capacitance

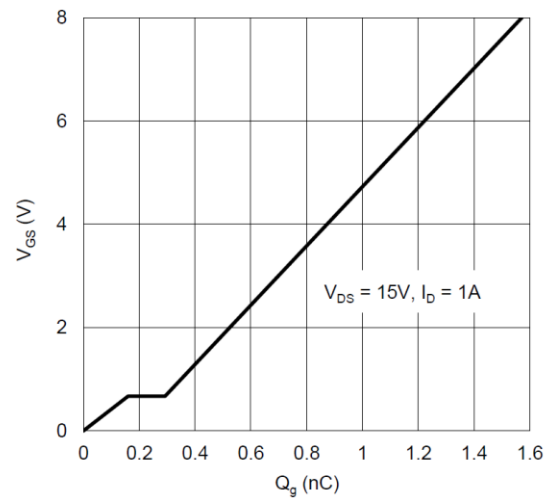


Fig. 10 Gate Charge

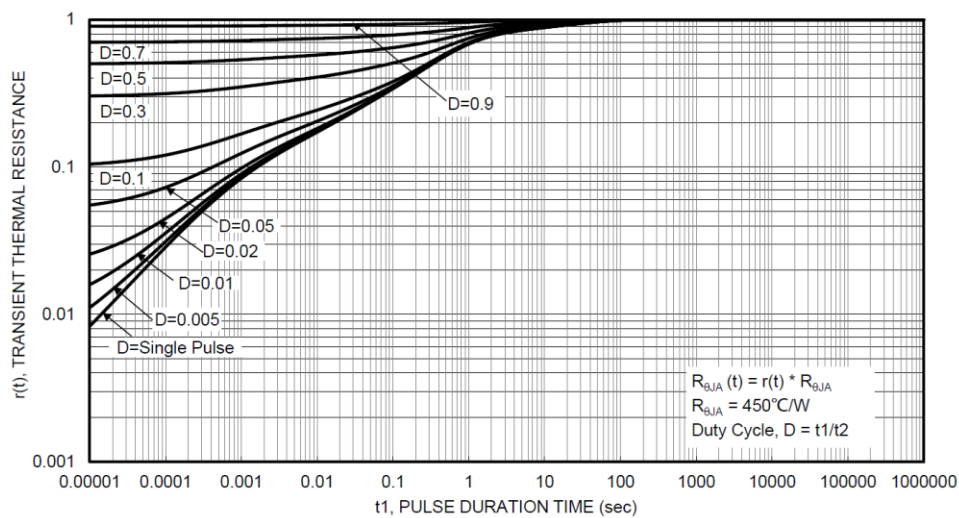
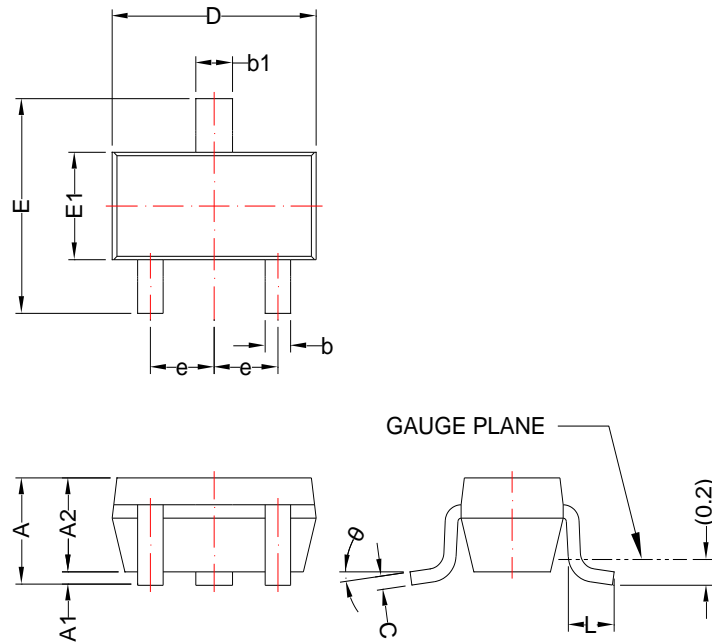


Fig. 11 Transient Thermal Response

## Package Dimension

### SOT-523



DIMENSION D AND E1 DO NOT INCLUDE MOLD FLASH, TIE BAR BURRS, GATE BURRS, AND INTERLEAD FLASH, NOT INCLUDING ANY MISMATCH BETWEEN THE TOP AND BOTTOM OF THE PLASTIC BODY

Dimensions				
Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	0.60	0.95	0.024	0.037
A1	0.00	0.10	0.000	0.004
A2	0.60	0.85	0.024	0.033
b	0.15	0.30	0.006	0.012
b1	0.25	0.40	0.010	0.016
c	0.08	0.25	0.003	0.010
D	1.40	1.80	0.055	0.071
E	1.40	1.80	0.055	0.071
E1	0.70	0.90	0.028	0.035
e	0.50 BSC		0.020 BSC	
L	0.26	0.46	0.010	0.018
θ	0°	8°	0°	8°





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