

GSM02P15

150V P-Channel Enhancement MOSFETs

General Description

These P-Channel enhancement mode power field effect transistors are using trench DMOS technology.

This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode.

These devices are well suited for high efficiency fast switching applications.

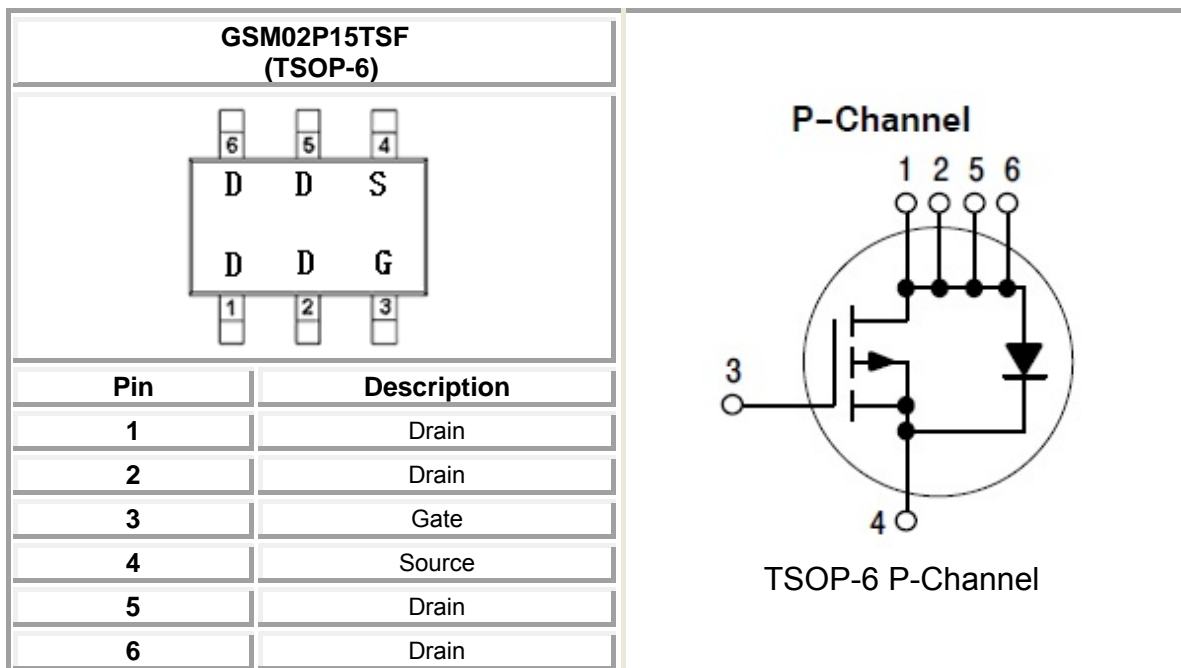
Features

- -150V/-1A, $R_{DS(ON)}=750m\Omega@V_{GS}=-1V$
- Improved dv/dt capability
- Fast switching
- Green Device Available

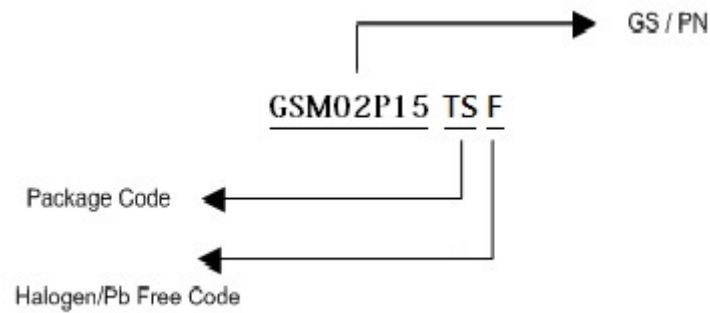
Applications

- Networking
- Load Switch
- LED applications

Packages & Pin Assignments

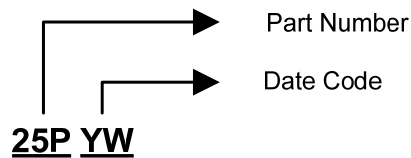


Ordering Information



Part Number	Package	Quantity Reel
GSM02P15TSF	TSOP-6	3000 PCS

Marking Information



Absolute Maximum Ratings

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

Symbol	Parameter	Typical	Unit
V_{DS}	Drain-Source Voltage	-150	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Drain Current- Continuous ($T_A=25^\circ\text{C}$)	-1	A
	Drain Current- Continuous ($T_A=100^\circ\text{C}$)	-0.63	A
I_{DM}	Drain Current- Pulsed ¹	-4	A
P_D	Power Dissipation ($T_A=25^\circ\text{C}$)	1.56	W
	Power Dissipation –Derate above 25°C	0.012	W/ $^\circ\text{C}$
T_J	Operating Junction Temperature Range	-50 to 150	$^\circ\text{C}$
T_{STG}	Storage Temperature Range	-50 to 150	$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Typ.	Max	Unit
$R_{\theta JA}$	Thermal Resistance-Junction to ambient	---	80	$^\circ\text{C}/\text{W}$

Electrical Characteristics (T_A=25°C unless otherwise noted)

Off Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	-150	---	---	V
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =-250uA	-2	-3	-4	
I _{GSS}	Gate-Source Leakage Current	V _{DS} =0V, V _{GS} =±20V	---	---	±100	nA
I _{DSS}	Drain-Source Leakage Current	V _{DS} =-150V, V _{GS} =0V, T _J =25°C	---	---	-1	uA
		V _{DS} =-120V, V _{GS} =0V, T _J =125°C	---	---	-10	
R _{DS(on)}	Drain-Source On-Resistance	V _{GS} =10V, I _D =-1A	---	650	800	mΩ
		V _{GS} =6V, I _D =-0.5A	---	700	650	
G _{FS}	Forward Transconductance	V _{DS} =10V, I _D =3A	---	2	---	S
Dynamic						
C _{iss}	Input Capacitance	V _{DS} =-25V, V _{GS} =0V, F=1MHz	---	430	700	pF
C _{oss}	Output Capacitance		---	38	60	
C _{rss}	Reverse Transfer Capacitance		---	28	56	
Q _g	Total Gate Charge ^{2,3}	V _{DS} =-75V, V _{GS} =10V, I _D =-1A	---	4.4	8	nC
Q _{gs}	Gate-Source Charge ^{2,3}		---	0.7	2	
Q _{gd}	Gate-Drain Charge ^{2,3}		---	1.5	3	
t _{d(on)}	Turn-On Time ^{2,3}	V _{DD} =-75V, V _{GS} =-10V, R _G =10Ω, I _D =-1A,	---	12.5	20	ns
t _r			---	8.9	18	
t _{d(off)}	Turn-Off Time ^{2,3}		---	17.3	36	
t _f			---	11.5	24	
R _g	Gate Resistance		V _{GS} =0V, V _{DS} =0V, F=1MHz	---	30	

Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current	V _G =V _D =0V, Force Current	---	---	-1	A
I _{SM}	Pulsed Source Current		---	---	-2	A
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =1A, T _J =25°C	---	---	-1	V

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
3. Essentially independent of operating temperature.

Typical Performance Characteristics

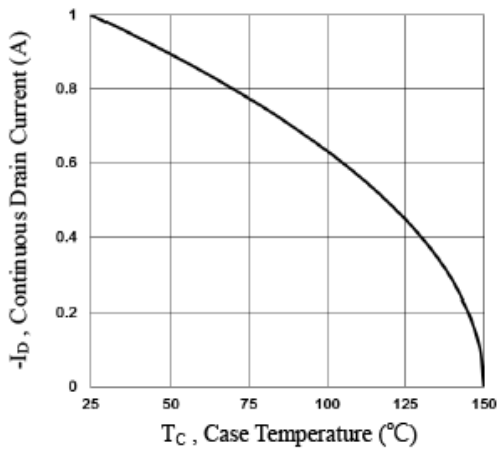


Fig.1 Continuous Drain Current vs. T_C

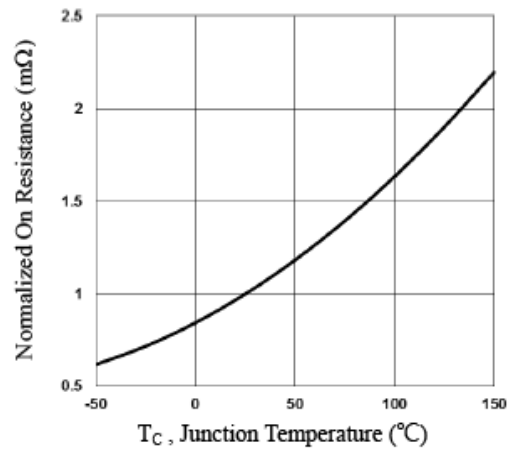


Fig.2 Continuous Drain Current vs. T_C

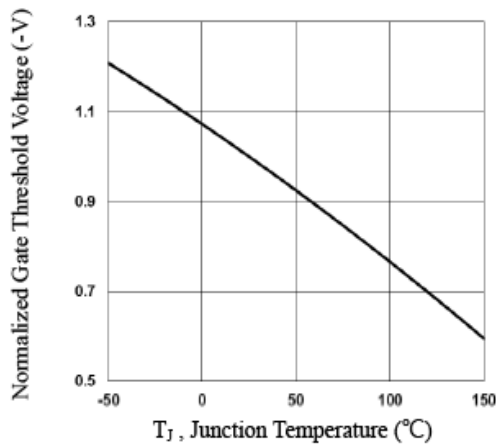


Fig.3 Normalized V_{th} vs. T_J

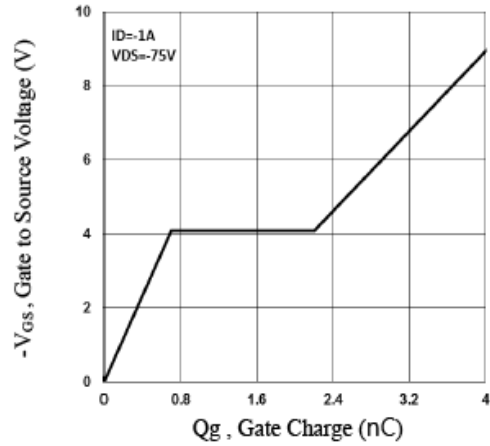


Fig.4 Gate Charge Waveform

Typical Performance Characteristics (Continue)

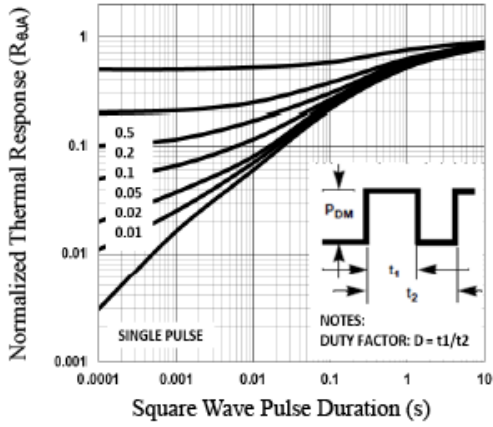


Fig.5 Normalized Transient Impedance

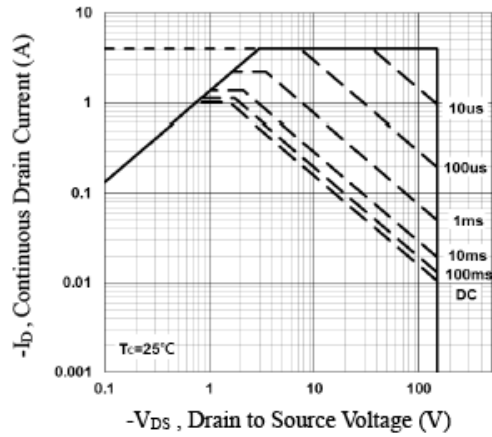


Fig.6 Maximum Safe Operation Area

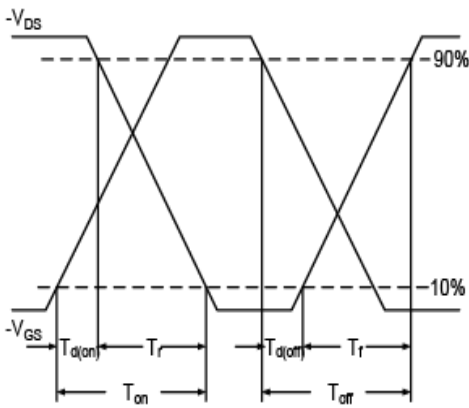


Fig.7 Switching Time Waveform

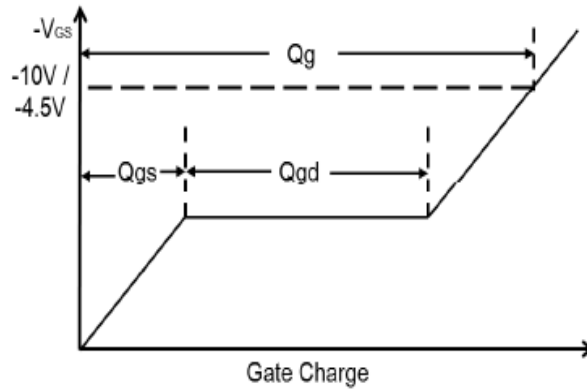
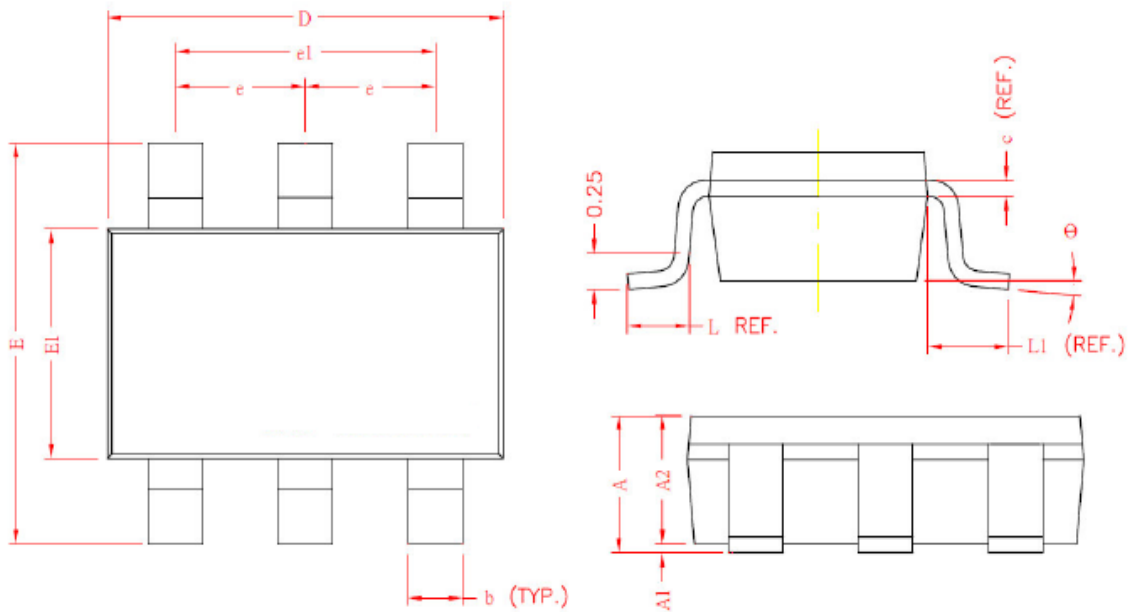


Fig.8 Gate Charge Waveform

Package Dimension

TSOP-6 Plastic Package Information







Dimensions				
Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	-	1.45	-	0.057
A1	0.00	0.10	0.000	0.004
A2	0.70	1.35	0.028	0.053
c	0.12 (REF)		0.005 (REF)	
D	2.70	3.10	0.106	0.122
E	2.60	3.00	0.102	0.118
E1	1.40	1.80	0.055	0.071
L	0.45 (REF)		0.018 (REF)	
L1	0.60 (REF)		0.024 (REF)	
θ	0°	10°	0°	10°
b	0.30	0.50	0.012	0.020
e	0.95 (REF)		0.037 (REF)	
e1	1.90 (REF)		0.075 (REF)	

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