

GSM2307P

20V P-Channel MOSFETs

Product 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.

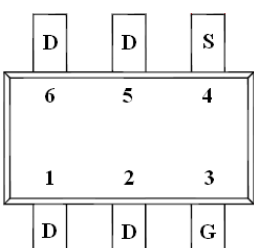
Features

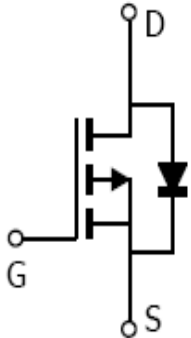
- -20V, -6.5A, $R_{DS(ON)}=26m\Omega@V_{GS}=-4.5$
- Improved dv/dt capability
- Fast switching
- Suit for -1.8V Gate Drive Applications
- Green Device Available
- SOT-23-6L package design

Applications

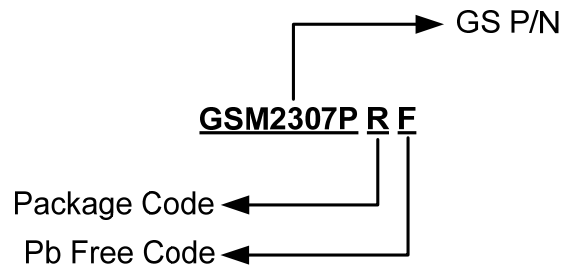
- Notebook
- Load Switch
- Networking

Packages & Pin Assignments

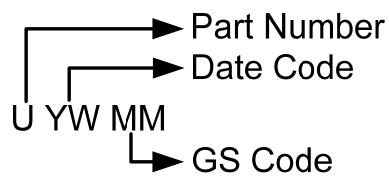
GSM2307PRF (SOT-23-6L)	
 <p style="text-align: center;">Top Views</p>	
Pin	Description
1	Drain
2	Drain
3	Gate
4	Source
5	Drain
6	Drain



Ordering Information



Marking Information



Part Number	Package	Part Marking	Quantity
GSM2307PRF	SOT-23-6L	UYWMM	3000pcs

Absolute Maximum Ratings

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

Symbol	Parameter	Typical	Unit
V_{DS}	Drain-Source Voltage	-20	V
V_{GS}	Gate-Source Voltage	± 10	V
I_D	Continuous Drain Current	$T_A=25^\circ\text{C}$	-6.5
		$T_A=100^\circ\text{C}$	-4.1
I_{DM}	Pulsed Drain Current	-26	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	-55 to +150	$^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to +150	$^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	80	$^\circ\text{C}/\text{W}$

Electrical Characteristics

T_A=25°C Unless otherwise noted

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250μA	-20			V
ΔBV _{DSS} /ΔT _J	BV _{DSS} Temperature Coefficient	Reference to 25°C, I _D =-1mA		-0.01		V/°C
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250μA	-0.3	-0.6	-1.0	V
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient			3		mV/°C
I _{GSS}	Gate Leakage Current	V _{DS} =0V, V _{GS} =±10V			±100	nA
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-20V, V _{GS} =0V			-1	μA
		V _{DS} =-16V, V _{GS} =0V, T _J =125°C			-10	
I _S	Continuous Source Current	V _G =V _D =0V, Force Current			-6.5	A
I _{SM}	Pulsed Source Current				-26	
R _{DS(on)}	Drain-Source On-Resistance	V _{GS} =-4.5V, I _D =-5A		21	26	mΩ
		V _{GS} =-2.5V, I _D =-4A		26	32	
		V _{GS} =-1.8V, I _D =-3A		32	40	
g _{FS}	Forward Transconductance	V _{DS} =-10V, I _S =-5A		15		S
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =-1A			-1	V
Dynamic						
Q _g	Total Gate Charge	V _{DS} =-10V, V _{GS} =-4.5V, I _D =-5A		19.5	29	nC
Q _{gs}	Gate-Source Charge			2	4	
Q _{gd}	Gate-Drain Charge			3.6	7	
C _{iss}	Input Capacitance	V _{DS} =-15V, V _{GS} =0V, f=1MHz		1670	2430	pF
C _{oss}	Output Capacitance			220	320	
C _{rss}	Reverse Transfer Capacitance			120	180	
t _{d(on)}	Turn-On Time	V _{DD} =-10V, I _D =-1A, V _{GS} =-4.5V, R _G =25Ω		10.4	20	ns
t _r				37.5	71	
t _{d(off)}	Turn-Off Time			89.1	129	
t _f				24.6	47	

Typical Performance Characteristics

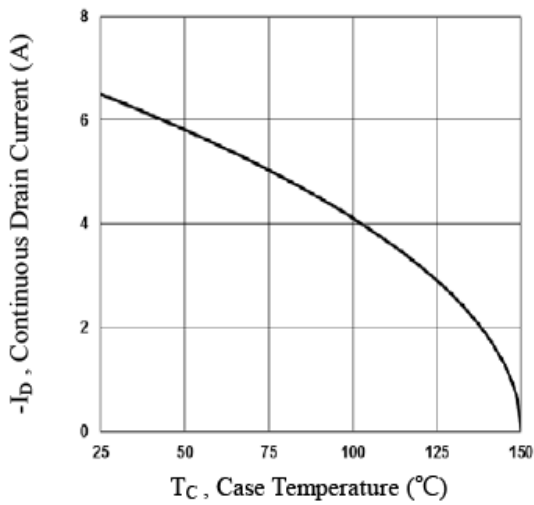


Fig.1 Continuous Drain Current vs. T_C

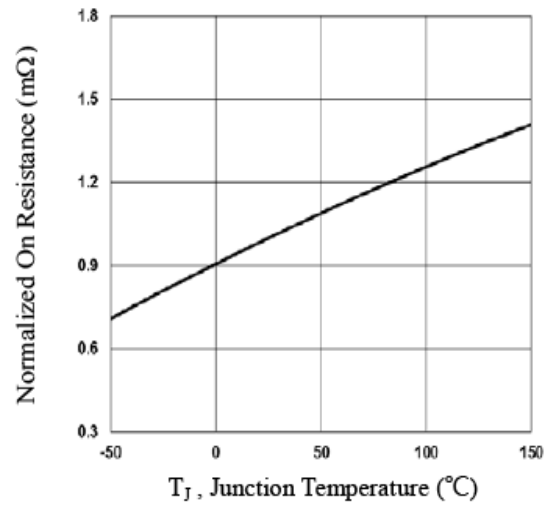


Fig.2 Normalized RDS(on) vs. T_J

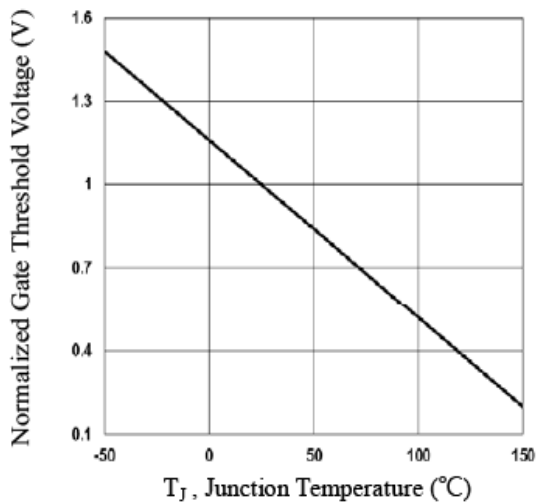


Fig.3 Normalized V_{th} vs. T_J

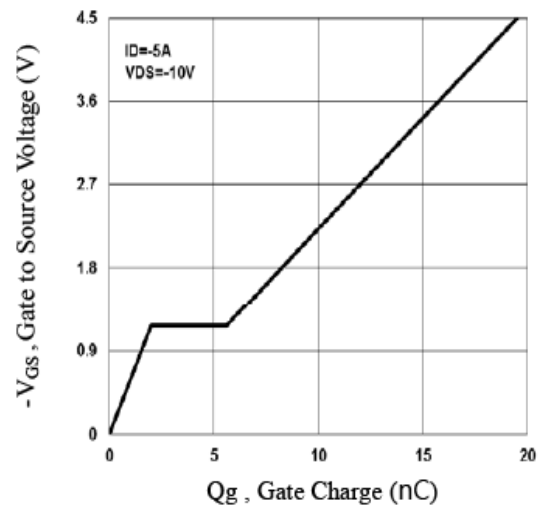


Fig.4 Gate Charge Waveform

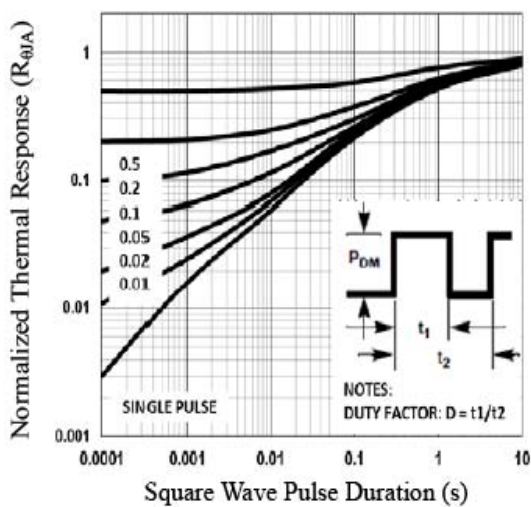


Fig.5 Normalized Transient Impedance

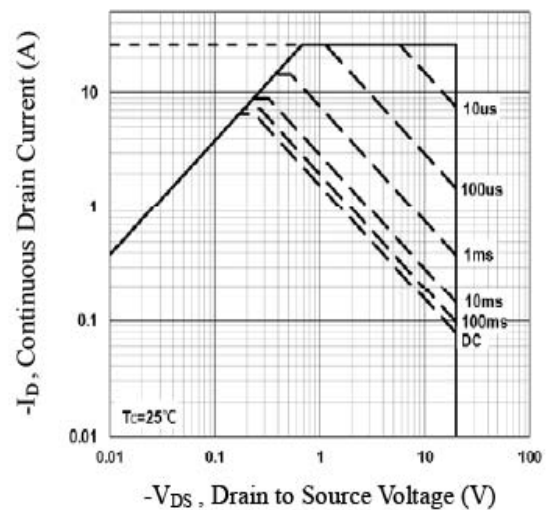
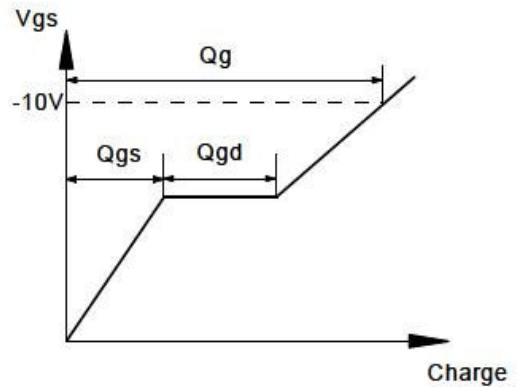
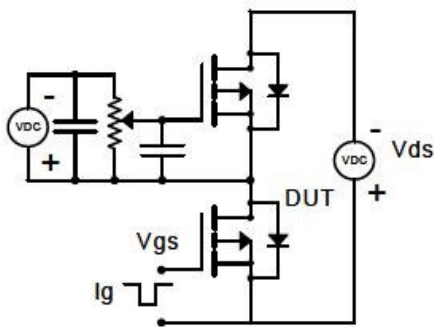


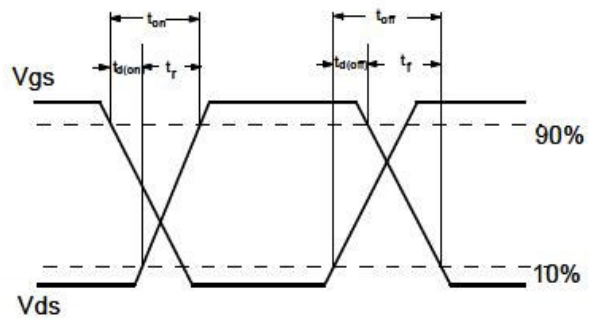
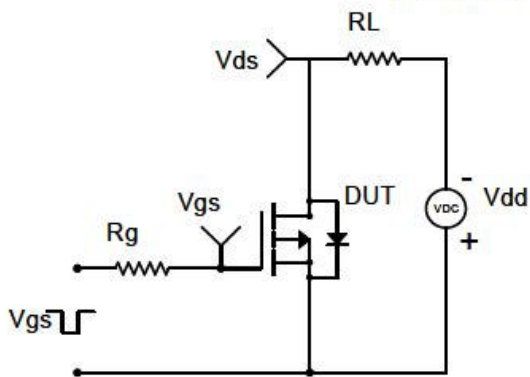
Fig.6 Maximum Safe Operation Area

Typical Performance Characteristics (Continue)

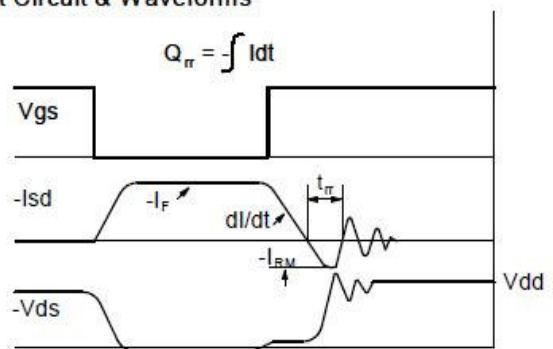
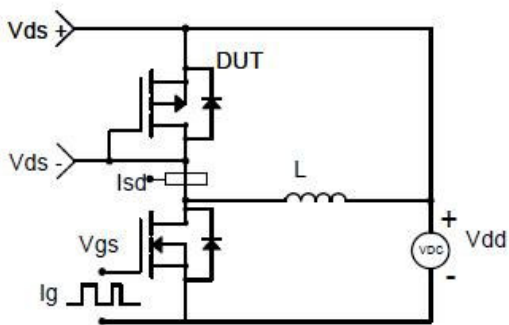
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

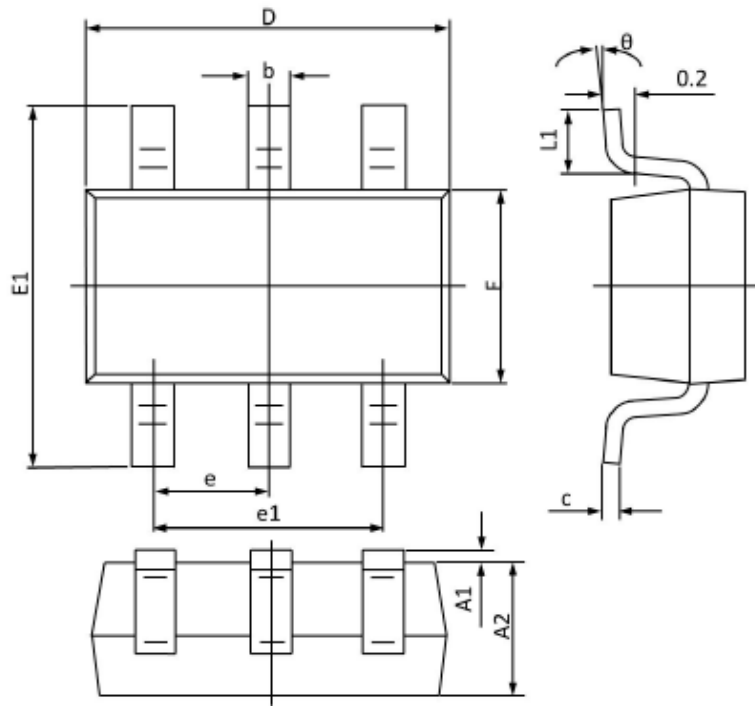


Diode Recovery Test Circuit & Waveforms



Package Dimension

SOT-23-6L







Dimensions




Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A1	0.000	0.100	0.000	0.004
A2	1.000	1.200	0.040	0.047
b	0.300	0.500	0.012	0.019
c	0.047	0.207	0.002	0.008
D	2.800	3.000	0.110	0.118
E1	2.600	3.000	0.103	0.118
e	0.950 (TYP)		0.037 (TYP)	
e1	1.900 (TYP)		0.075 (TYP)	
L1	0.250	0.550	0.010	0.021
θ	0°	8°	0°	8°



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