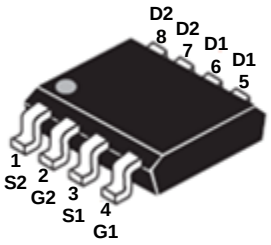
UT4957G-S08-R
-30V Dual P-Channel Enhancement-Mode MOSFET

General Description

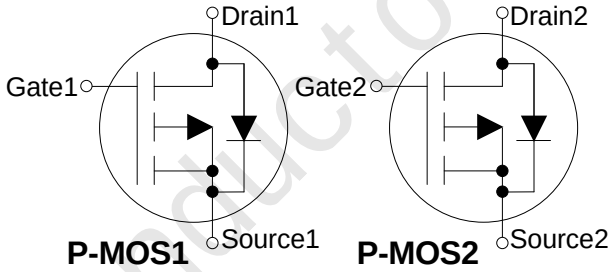
These -30V dual P-Channel enhancement mode power field effect transistors in one package are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency fast switching applications.



1. Source 2
2. Gate 2
3. Source 1
4. Gate 1
8. Drain 2
7. Drain 2
6. Drain 1
5. Drain 1

Features

- V_{DS}=-30V
- I_D=-9A @V_{GS}=-10V
- Rds(on)=14mΩ(Typ.)@V_{GS}=-10V
- Rds(on)=19mΩ(Typ.)@V_{GS}=-4.5V
- Fast switching speed
- High power and current handling capability
- Package: SOP-8L
- Pb-Free and Green devices are available



Applications

- POL Applications
- Load Switch
- LED Applications

Absolute Maximum Ratings (T_A=25ºC unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	-30	V
Gate-Source Voltage		V_{GS}	±20	V
Drain Current [a]	T_C=25ºC	I_D	-9	A
	T_C=70ºC		-5	
Drain Current –Pulsed [a]		I_{DM}	-36	A
Power Dissipation (T_C=25ºC)		P_D	2.1	W
Power Dissipation – Decrease above 25ºC			0.017	W/ºC
Storage Temperature Range		T_{STG}	-55 ~ +150	ºC
Operating Junction Temperature Range		T_J	-55 ~ +150	ºC
Thermal Resistance, Junction-to-Ambient1		$R_{\theta JA}$	62.5	ºC/W

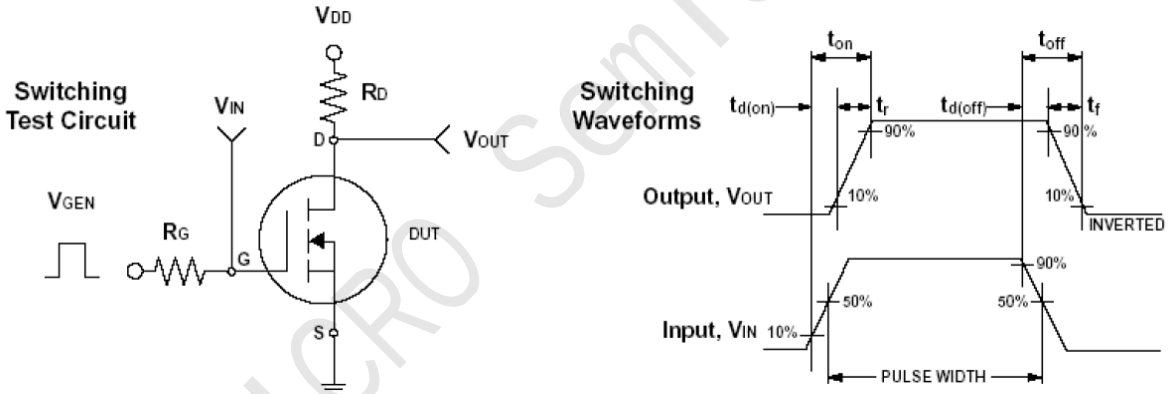
Electrical Characteristics (T_A=25ºC unless otherwise noted)

Parameter		Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics							
Drain-Source Breakdown Voltage		BV_{DSS}	V_{GS}=0V, I_D=-250μA	-30	---	---	V
Zero Gate Voltage Drain Current	T_J=25°C	I_{DSS}	V_{DS}=-30V, V_{GS}=0V	---	---	-1	μA
	T_J=125°C		V_{DS}=-24V, V_{GS}=0V	---	---	-10	μA
Gate-Body Leakage		I_{GSS}	V_{GS}=±20V, V_{DS}=0V	---	---	±100	nA
On Characteristics [a]							
Gate Threshold Voltage		$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-250μA	-1.2	---	-2.5	V
Drain-Source On-State Resistance		$R_{DS(on)}$	V_{GS}=-10V, I_D=-9.0A	---	14	18	mΩ
			V_{GS}=-4.5V, I_D=-5.0A	---	19	29	
Forward Transconductance		gfs	V_{DS}=-5V, I_D=-9A	---	18	---	S

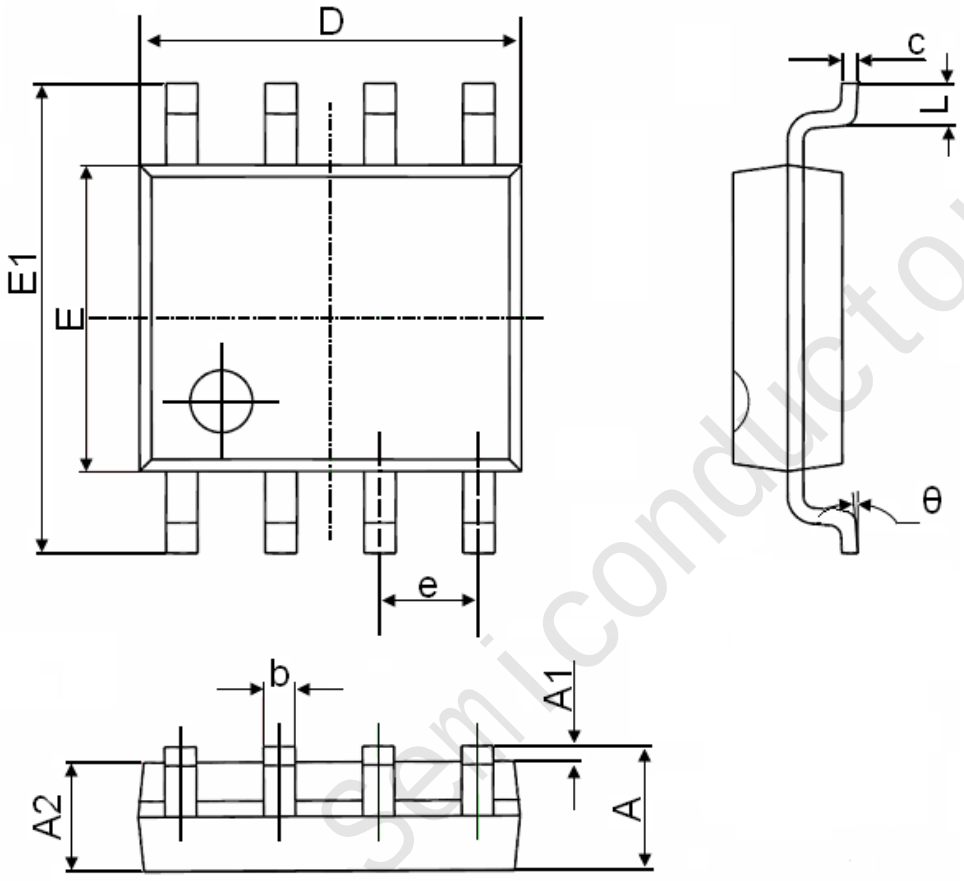
Drain-Source Diode Characteristics [a]						
Continuous Source Current	I_S	V_G=V_D=0V, Force Current	---	---	-9	A
Pulsed Source Current	I_{SM}		---	---	-36	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=-1.0A, T_J=25℃	---	---	-1.0	V
Dynamic Characteristics [b]						
Input Capacitance	Ciss	VDS=-15V, VGS=0V, F=1MHz	---	1800	---	pF
Output Capacitance	Coss		---	305	---	
Reverse Transfer Capacitance	Crss		---	216	---	
Switching Characteristics [b]						
Total Gate Charge	Qg	V_{DS}=-15V, V_{GS}=-10V, I_D=-9A	---	30	---	nC
Gate-Source Charge	Qgs		---	6	---	
Gate-Drain Charge	Qgd		---	9	---	
Turn-On Delay Time	Td(on)	V_{DD}=-15V, V_{GS}=-10V, R_L=15Ω I_D=-1A, R_G=2.5Ω	---	10	---	ns
Rise Time	Tr		---	26	---	
Turn-Off Delay Time	Td(off)		---	35	---	
Fall Time	Tf		---	8	---	

Notes: a. Repetitive Rating: Pulsed width limited by maximum junction temperature.
b. Pulse test: pulse width ≤ 300us, duty cycle ≤ 2%.
c. Guaranteed by design, not subject to production testing.

Switching Time Test Circuit and Waveforms



SOP-8 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

Soldering Methods For Products

1. Storage environment : Temperature=10ºC~35ºC, Humidity=65%±15%
2. Reflow soldering of surface mount devices

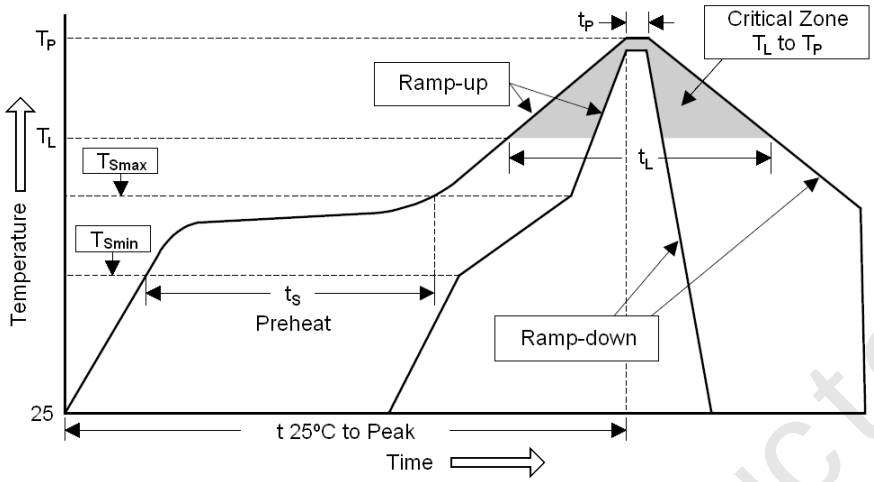


Figure : Temperature Profile

Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Average ramp-up rate (T_L to T_P)	< 3ºC/sec	< 3ºC/sec
Preheat - Temperature Min (TSmin) - Temperature Max (TSmax) - Time (Min to Max) (ts)	 100ºC 150ºC 60 ~ 120 sec	 100ºC 200ºC 60 ~ 180 sec
TSmax to T_L - Ramp-up rate	 < 3ºC/sec	 < 3ºC/sec
Time maintained above: - Temperature (T_L) - Time (t_L)	 183ºC 60 ~ 150 sec	 217ºC 60 ~ 150 sec
Peak Temperature (T_P)	240ºC +0/-5ºC	260ºC +0/-5ºC
Time within 5ºC of actual Peak Temperature (t_P)	10 ~ 30 sec	20 ~ 40 sec
Ramp-down rate	< 6ºC/sec	< 6ºC/sec
Time 25ºC to Peak Temperature	< 6 minutes	< 8 minutes

3. Flow (wave) soldering (solder dipping)

Product	Peak Temperature	Dipping Time
Pb devices	245ºC ±5ºC	5sec ±1sec
Pb-Free devices	260ºC +0/-5ºC	5sec ±1sec

- 经锡炉或回焊炉的温度切勿超过 260 ºC (Max safe temperature: 260℃)。

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- MOS 管电路是静电敏感元器件，且对生产环境要求较严，建议在存放、运输及生产操作时一定要避免静电干扰。
- 由于每个 PCB 版图和设计都不同，每个 MOSFET 的结构也不同，因此，没有通用的流程可用来计算每个应用的最大允许电流，建议在选用 MOS 管器件时考虑到余量，以免 MOS 管因此而造成损坏。