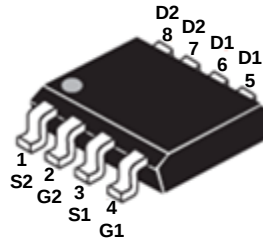


General Description

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.



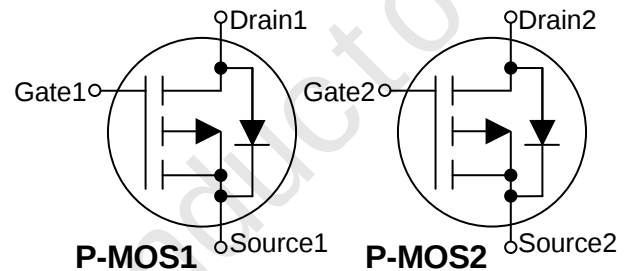
- | | |
|-------------|------------|
| 1. Source 2 | 8. Drain 2 |
| 2. Gate 2 | 7. Drain 1 |
| 3. Source 1 | 6. Drain 1 |
| 4. Gate 1 | 5. Drain 1 |

Features

- $V_{DS} = -30V$
- $I_D = -7.5A$ @ $V_{GS} = -10V$
- $R_{DS(on)} = 17m\Omega$ (Typ.) @ $V_{GS} = -10V$
- $R_{DS(on)} = 26m\Omega$ (Typ.) @ $V_{GS} = -4.5V$
- Fast switching
- Suit for -4.5V gate drive applications
- Package: SOP-8
- Pb-Free and Green devices are available

Applications

- MB / VGA / Vcore
- POL Applications
- Load Switch
- LED Applications



Absolute Maximum Ratings ($T_A = 25^\circ C$ 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 =25°C	I _D	-7.5	A
	T _C =70°C		-4.13	
Drain Current –Pulsed ^a		I _{DM}	-30	A
Power Dissipation (T _C =25°C)		P _D	2.1	W
Power Dissipation – Decrease above 25°C			0.017	W/°C
Storage Temperature Range		T _{STG}	-55 ~ +150	°C
Operating Junction Temperature Range		T _J	-55 ~ +150	°C
Thermal Resistance, Junction-to-Ambient1		R _{θJA}	62.5	°C/W

Electrical Characteristics ($T_A = 25^\circ C$ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_D = -250\mu A$	-30	---	---	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -30V, V_{GS} = 0V$	---	---	-1	μA
		$V_{DS} = -24V, V_{GS} = 0V$	---	---	-10	μA
Gate-Body Leakage	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$	---	---	± 100	nA
On Characteristics ^a						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-1.0	-1.6	-2.5	V

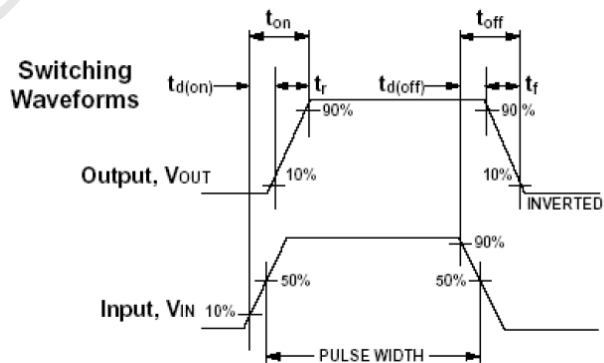
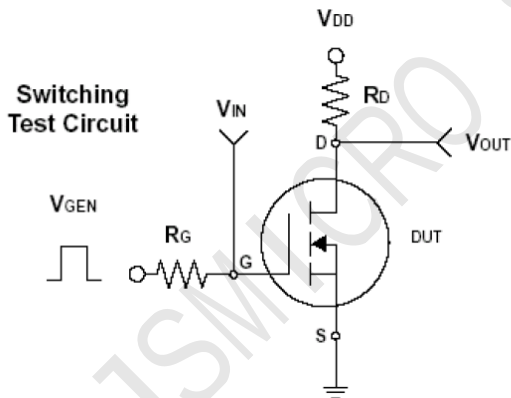
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-7.5A$	---	17	24	mΩ
		$V_{GS}=-4.5V, I_D=-5.0A$	---	26	40	
Forward Transconductance	g_{fs}	$V_{DS}=-10V, I_D=-3A$	---	6.8	---	S
Drain-Source Diode Characteristics ^a						
Continuous Source Current	I_S	$V_G=V_D=0V$, Force Current	---	---	-7.5	A
Pulsed Source Current	I_{SM}		---	---	-30	A
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=-1.0A, T_J=25^{\circ}C$	---	---	-1.0	V
Dynamic Characteristics ^b						
Input Capacitance	C_{iss}	$V_{DS}=-15V, V_{GS}=0V, F=1MHz$	---	1250	1820	pF
Output Capacitance	C_{oss}		---	160	235	
Reverse Transfer Capacitance	C_{rss}		---	90	130	
Switching Characteristics ^b						
Total Gate Charge	Q_g	$V_{DS}=-15V, V_{GS}=-4.5V, I_D=-5A$	---	11	17	nC
Gate-Source Charge	Q_{gs}		---	3.4	6	
Gate-Drain Charge	Q_{gd}		---	4.2	8	
Turn-On Delay Time	$T_{d(on)}$	$V_{DD}=-15V, V_{GS}=-10V, R_G=6\Omega$ $I_D=-1A$	---	5.8	11	ns
Rise Time	T_r		---	18.8	36	
Turn-Off Delay Time	$T_{d(off)}$		---	46.9	89	
Fall Time	T_f		---	12.3	23	

Notes: a. Repetitive Rating: Pulsed width limited by maximum junction temperature.

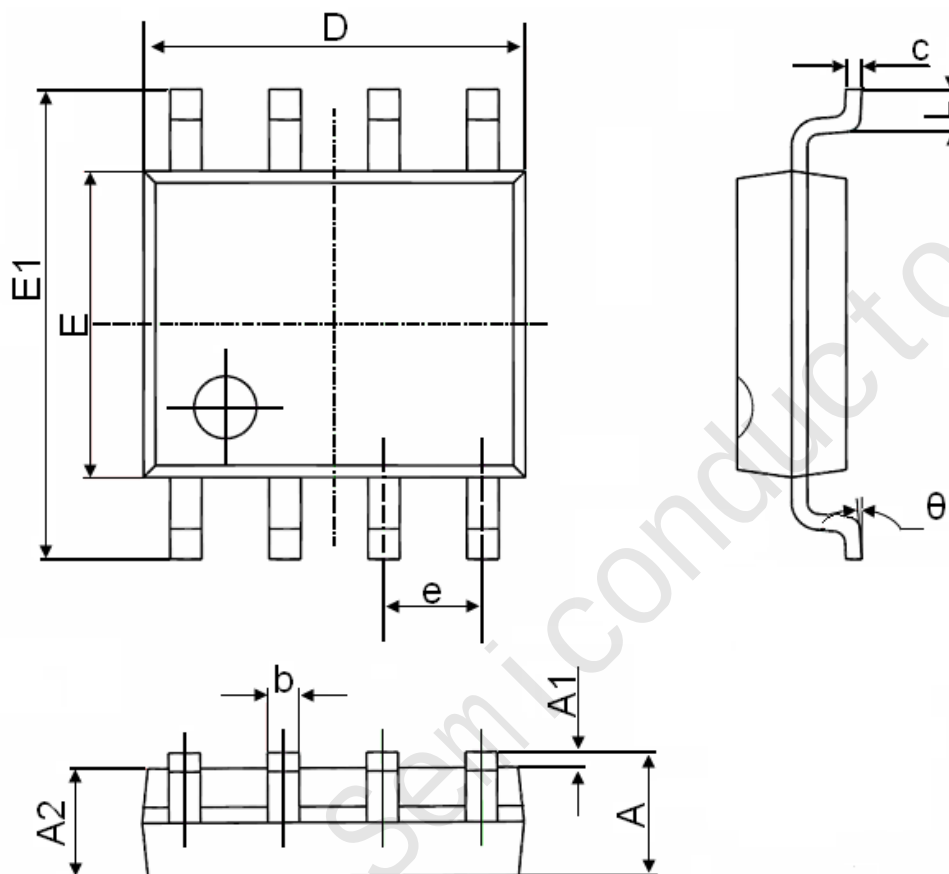
b. Pulse test: pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

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=10°C~35°C, Humidity=65%±15%
2. Reflow soldering of surface mount devices

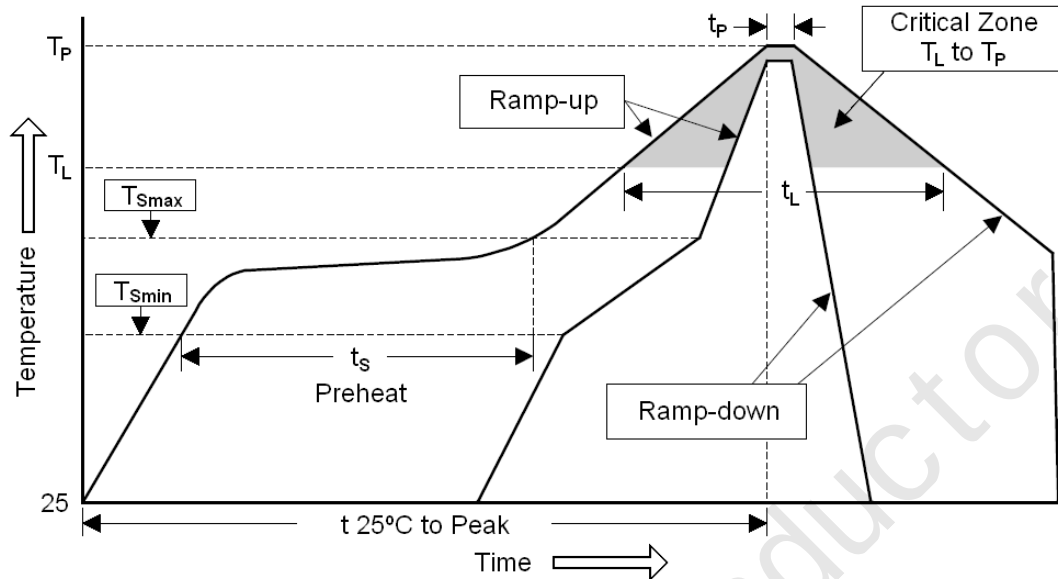


Figure : Temperature Profile

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

3. Flow (wave) soldering (solder dipping)

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

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