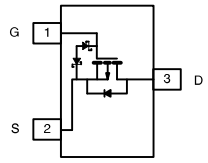
P-Channel 30 V (D-S) MOSFET

PRODUCT SUMMARY			
V_{DS} (V)	$R_{DS(on)}$ (Ω) Max.	I_D (A)[a]	Q_g (Typ.)
- 30	0.045 at V_{GS} = - 10 V	- 4.8	10.6 nC
	0.053 at V_{GS} = - 4.5 V	- 4.4	
	0.080 at V_{GS} = - 2.5 V	- 3.6	

TO-236
(SOT-23)



Top View

Si2371EDS (E6)*
* Marking Code

Ordering Information:
Si2371EDS-T1-GE3 (Lead (Pb)-free and Halogen-free)

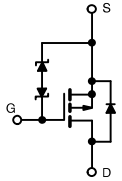
FEATURES

- TrenchFET® Power MOSFET
- 100 % R_g Tested
- Built-in ESD Protection
  - Typical ESD Performance 3000 V
- Material categorization:
  For definitions of compliance please see
  www.vishay.com/doc?99912

RoHS COMPLIANT
HALOGEN FREE

APPLICATIONS

- Power Management for Portable and Consumer
  - Load Switches
  - OVP (Over Voltage Protection) Switch



P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C, unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	- 30	V
Gate-Source Voltage		V_{GS}	± 12	
Continuous Drain Current (T_J = 150 °C)	T_C = 25 °C	I_D	- 4.8	A
	T_C = 70 °C		- 3.8	
	T_A = 25 °C		- 3.7[b,c]	
	T_A = 70 °C		- 2.9[b,c]	
Pulsed Drain Current (t = 300 µs)		I_{DM}	- 20	
Continuous Source-Drain Diode Current	T_C = 25 °C	I_S	- 1.4	
	T_A = 25 °C		- 1[b,c]	
Maximum Power Dissipation	T_C = 25 °C	P_D	1.7	W
	T_C = 70 °C		1.1	
	T_A = 25 °C		1[b,c]	
	T_A = 70 °C		0.6[b,c]	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	- 55 to 150	°C
Soldering Recommendations (Peak Temperature)[d, e]			260	

THERMAL RESISTANCE RATINGS

Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient[b, d]	t ≤ 5 s	R_{thJA}	100	130	°C/W
Maximum Junction-to-Foot (Drain)	Steady State	R_{thJF}	60	75	

Notes:
a. T_C = 25 °C.
b. Surface mounted on 1" x 1" FR4 board.
c. t = 5 s.
d. Maximum under steady state conditions is 175 °C/W.

Si2371EDS
Vishay Siliconix

SPECIFICATIONS (T_J = 25 °C, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V_{DS}	V_{GS} = 0 V, I_D = - 250 µA	- 30			V
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	I_D = - 250 µA		- 24		mV/°C
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}/T_J$			2.2		
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = - 250 µA	- 0.6		- 1.5	V
Gate-Source Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 12 V			± 10	µA
		V_{DS} = 0 V, V_{GS} = ± 4.5 V			± 1	
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = - 30 V, V_{GS} = 0 V			- 1	
		V_{DS} = - 30 V, V_{GS} = 0 V, T_J = 55 °C			- 10	
On-State Drain Current[a]	$I_{D(on)}$	V_{DS} ≤ - 5 V, V_{GS} = - 10 V	- 15			A
Drain-Source On-State Resistance[a]	$R_{DS(on)}$	V_{GS} = - 10 V, I_D = - 3.7 A		0.037	0.045	Ω
		V_{GS} = - 4.5 V, I_D = - 2 A		0.044	0.053	
		V_{GS} = - 2.5 V, I_D = - 2 A		0.066	0.080	
Dynamic[b]						
Total Gate Charge	Q_g	V_{DS} = - 15 V, V_{GS} = - 10 V, I_D = - 3.7 A		22.8	35	nC
		V_{DS} = - 15 V, V_{GS} = - 4.5 V, I_D = - 3.7 A		10.6	16	
Gate-Source Charge	Q_{gs}			1.7		
Gate-Drain Charge	Q_{gd}			2.6		
Gate Resistance	R_g	f = 1 MHz	2.2	11	22	Ω
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = - 15 V, R_L = 5.2 Ω I_D ≅ - 2.9 A, V_{GEN} = - 4.5 V, R_g = 1 Ω		28	42	ns
Rise Time	t_r			65	98	
Turn-Off Delay Time	$t_{d(off)}$			47	71	
Fall Time	t_f			62	93	
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = - 15 V, R_L = 5.2 Ω I_D ≅ - 2.9 A, V_{GEN} = - 10 V, R_g = 1 Ω		7	14	
Rise Time	t_r			8	16	
Turn-Off Delay Time	$t_{d(off)}$			52	78	
Fall Time	t_f			52	78	
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I_S	T_C = 25 °C			- 1.4	A
Pulse Diode Forward Current	I_{SM}				- 20	
Body Diode Voltage	V_{SD}	I_S = - 2.9 A, V_{GS} = 0 V		- 0.8	- 1.2	V
Body Diode Reverse Recovery Time	t_{rr}	I_F = - 2.9 A, dI/dt = 100 A/µs, T_J = 25 °C		13	20	ns
Body Diode Reverse Recovery Charge	Q_{rr}			6	12	nC
Reverse Recovery Fall Time	t_a			9		ns
Reverse Recovery Rise Time	t_b			4		

Notes:
a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %.
b. Guaranteed by design, not subject to production testing.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.