SI1489EDH

PRODUCT SUMMARY

V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)[a]	Q_g (Typ.)
- 8	0.048 at V_{GS} = - 4.5 V	- 2.0[e]	10.5 nC
	0.059 at V_{GS} = - 2.5 V	- 2.0[e]	
	0.073 at V_{GS} = - 1.8 V	- 2.0[e]	
	0.097 at V_{GS} = - 1.5 V	- 1.5	
	0.190 at V_{GS} = - 1.2 V	- 0.5	

FEATURES

RoHS COMPLIANT

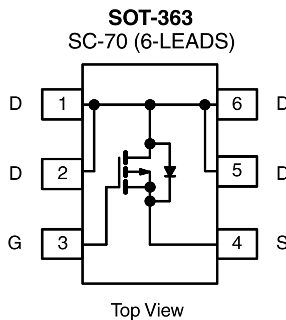
HALOGEN FREE

- **Halogen-free According to IEC 61249-2-21 Definition**
- TrenchFET® Power MOSFET
- 100 % R_g Tested
- Typical ESD Performance 2000 V in HBM
- Built in ESD Protection with Zener Diode
- Compliant to RoHS Directive 2002/95/EC

APPLICATIONS

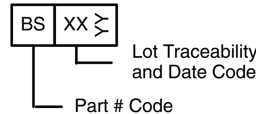
- Load Switch for Portable Devices
  - Cellular Phone/Smart Phone
  - DSC
  - Portable Game Console
  - MP3
  - GPS
  - Tablet PC

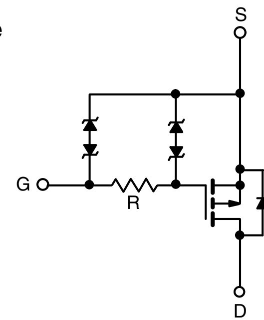
SOT-363
SC-70 (6-LEADS)



Top View

Marking Code





P-Channel MOSFET

Ordering Information: Si1489EDH-T1-GE3 (Lead (Pb)-free and Halogen-free)

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

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	- 8	V
Gate-Source Voltage		V_{GS}	± 5	
Continuous Drain Current (T_J = 150 °C)	T_C = 25 °C	I_D	- 2.0[a, e]	A
	T_C = 70 °C		- 2.0[e]	
	T_A = 25 °C		- 2.0[b, c, e]	
	T_A = 70 °C		- 2.0[b, c, e]	
Pulsed Drain Current (t = 300 µs)		I_{DM}	- 8	
Continuous Source-Drain Diode Current	T_C = 25 °C	I_S	- 2.0[a, e]	
	T_A = 25 °C		- 1.3[b, c]	
Maximum Power Dissipation	T_C = 25 °C	P_D	2.8	W
	T_C = 70 °C		1.8	
	T_A = 25 °C		1.56[b, c]	
	T_A = 70 °C		1[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}	60	80	°C/W
Maximum Junction-to-Foot (Drain)	Steady State	R_{thJF}	34	45	

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 125 °C/W.
e. Package limited.

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	- 8			V
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	I_D = - 250 µA		- 2		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	- 0.35		- 0.7	V
Gate-Source Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 5 V			± 5	µA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = - 8 V, V_{GS} = 0 V			- 1	
		V_{DS} = - 8 V, V_{GS} = 0 V, T_J = 55 °C			- 10	
On-State Drain Current[a]	$I_{D(on)}$	V_{DS} ≤ - 5 V, V_{GS} = - 4.5 V	- 8			A
Drain-Source On-State Resistance[a]	$R_{DS(on)}$	V_{GS} = - 4.5 V, I_D = - 3.0 A		0.040	0.048	Ω
		V_{GS} = - 2.5 V, I_D = - 1.0 A		0.048	0.059	
		V_{GS} = - 1.8 V, I_D = - 1.0 A		0.060	0.073	
		V_{GS} = - 1.5 V, I_D = - 0.5 A		0.070	0.097	
		V_{GS} = - 1.2 V, I_D = - 0.5 A		0.110	0.190	
Forward Transconductance[a]	g_{fs}	V_{DS} = - 4 V, I_D = - 3.0 A		12		S
Dynamic[b]						
Gate-Source Charge	Q_g	V_{DS} = - 4 V, V_{GS} = - 4.5 V, I_D = - 7.4 A		10.5	16	nC
	Q_{gs}			1.5		
Gate-Drain Charge	Q_{gd}			3.3		
Gate Resistance	R_g	f = 1 MHz	80	400	800	Ω
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = - 4 V, R_L = 0.7 Ω I_D ≅ - 6 A, V_{GEN} = - 4.5 V, R_g = 1 Ω		90	180	ns
Rise Time	t_r			170	340	
Turn-Off Delay Time	$t_{d(off)}$			690	1380	
Fall Time	t_f			630	1260	
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I_S	T_C = 25 °C			- 2.0	A
Pulse Diode Forward Current	I_{SM}				- 8	
Body Diode Voltage	V_{SD}	I_S = - 2 A, V_{GS} = 0 V		- 0.8	- 1.2	V
Body Diode Reverse Recovery Time	t_{rr}	I_F = - 2 A, dI/dt = 100 A/µs, T_J = 25 °C		30	60	ns
Body Diode Reverse Recovery Charge	Q_{rr}			12	25	nC
Reverse Recovery Fall Time	t_a			12		ns
Reverse Recovery Rise Time	t_b			18		

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