



# SI1563EDH

PRODUCT SUMMARY			
	V <sub>DS</sub> (V)	r <sub>DS(on)</sub> (Ω)	I <sub>D</sub> (A)
N-Channel	20	0.280 at V <sub>GS</sub> = 4.5 V	1.28
		0.360 at V <sub>GS</sub> = 2.5 V	1.13
		0.450 at V <sub>GS</sub> = 1.8 V	1.0
P-Channel	-20	0.490 at V <sub>GS</sub> = -4.5 V	-1.0
		0.750 at V <sub>GS</sub> = -2.5 V	-0.81
		1.10 at V <sub>GS</sub> = -1.8 V	-0.67

## FEATURES

- TrenchFET® Power MOSFETS: 1.8 V Rated
- ESD Protected: 2000 V
- Thermally Enhanced SC-70 Package

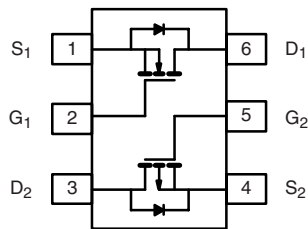


RoHS\*  
COMPLIANT

## APPLICATIONS

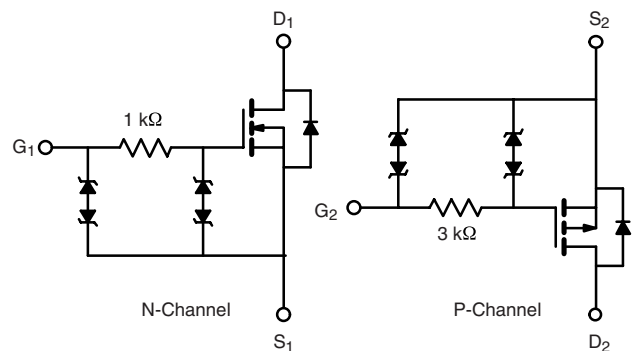
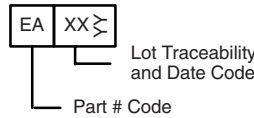
- Load Switching
- PA Switch
- Level Switch

SOT-363  
SC-70 (6-LEADS)



Top View

Marking Code



Ordering Information: SI1563EDH-T1  
SI1563EDH-T1-E3 (Lead (Pb)-free)

ABSOLUTE MAXIMUM RATINGS T <sub>A</sub> = 25 °C, unless otherwise noted							
Parameter	Symbol	N-Channel		P-Channel		Unit	
		5 s	Steady State	5 s	Steady State		
Drain-Source Voltage	V <sub>DS</sub>	20		-20		V	
Gate-Source Voltage	V <sub>GS</sub>	±12		±12		V	
Continuous Drain Current (T <sub>J</sub> = 150 °C)	I <sub>D</sub>	T <sub>A</sub> = 25 °C	1.28	1.13	-1.0	-0.88	A
		T <sub>A</sub> = 85 °C	0.92	0.81	-0.72	-0.63	
Pulsed Drain Current	I <sub>DM</sub>	4.0		-3.0		A	
Continuous Source Current (Diode Conduction) <sup>a</sup>	I <sub>S</sub>	0.61	0.48	-0.61	-0.48	A	
Maximum Power Dissipation <sup>a</sup>	P <sub>D</sub>	T <sub>A</sub> = 25 °C	0.74	0.57	0.30	0.57	W
		T <sub>A</sub> = 85 °C	0.38	0.30	0.16	0.3	
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	-55 to 150				°C	

THERMAL RESISTANCE RATINGS					
Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient <sup>a</sup>	t ≤ 5 s	R <sub>thJA</sub>	130	170	°C/W
	Steady State		170	220	
Maximum Junction-to-Foot (Drain)	Steady State	R <sub>thJF</sub>	80	100	

Notes:

a. Surface Mounted on 1" x 1" FR4 Board.

\* Pb containing terminations are not RoHS compliant, exemptions may apply.



SI1563EDH

SPECIFICATIONS $T_J = 25\text{ }^\circ\text{C}$ , unless otherwise noted							
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit	
<b>Static</b>							
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 100\text{ }\mu\text{A}$	N-Ch	0.45			V
		$V_{DS} = V_{GS}, I_D = -100\text{ }\mu\text{A}$	P-Ch	-0.45			
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0\text{ V}, V_{GS} = \pm 4.5\text{ V}$	N-Ch			$\pm 1$	$\mu\text{A}$
		$V_{DS} = 0\text{ V}, V_{GS} = \pm 12\text{ V}$	P-Ch			$\pm 1$	
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 16\text{ V}, V_{GS} = 0\text{ V}$	N-Ch			1	$\mu\text{A}$
		$V_{DS} = -16\text{ V}, V_{GS} = 0\text{ V}$	P-Ch			-1	
		$V_{DS} = 16\text{ V}, V_{GS} = 0\text{ V}, T_J = 85\text{ }^\circ\text{C}$	N-Ch			5	
		$V_{DS} = -16\text{ V}, V_{GS} = 0\text{ V}, T_J = 85\text{ }^\circ\text{C}$	P-Ch			-5	
On-State Drain Current <sup>a</sup>	$I_{D(on)}$	$V_{DS} \geq 5\text{ V}, V_{GS} = 4.5\text{ V}$	N-Ch	2			A
		$V_{DS} \leq -5\text{ V}, V_{GS} = -4.5\text{ V}$	P-Ch	-2			
Drain-Source On-State Resistance <sup>a</sup>	$r_{DS(on)}$	$V_{GS} = 4.5\text{ V}, I_D = 1.13\text{ A}$	N-Ch		0.220	0.280	$\Omega$
		$V_{GS} = -4.5\text{ V}, I_D = -0.88\text{ A}$	P-Ch		0.400	0.490	
		$V_{GS} = 2.5\text{ V}, I_D = 0.99\text{ A}$	N-Ch		0.281	0.360	
		$V_{GS} = -2.5\text{ V}, I_D = -0.71\text{ A}$	P-Ch		0.610	0.750	
		$V_{GS} = 1.8\text{ V}, I_D = 0.20\text{ A}$	N-Ch		0.344	0.450	
		$V_{GS} = -1.8\text{ V}, I_D = -0.20\text{ A}$	P-Ch		0.850	1.10	
Forward Transconductance <sup>a</sup>	$g_{fs}$	$V_{DS} = 10\text{ V}, I_D = 1.13\text{ A}$	N-Ch		2.6		S
		$V_{DS} = -10\text{ V}, I_D = -0.88\text{ A}$	P-Ch		1.5		
Diode Forward Voltage <sup>a</sup>	$V_{SD}$	$I_S = 0.48\text{ V}, V_{GS} = 0\text{ V}$	N-Ch		0.8	1.2	V
		$I_S = -0.48\text{ V}, V_{GS} = 0\text{ V}$	P-Ch		-0.8	-1.2	
<b>Dynamic<sup>b</sup></b>							
Total Gate Charge	$Q_g$	N-Channel $V_{DS} = 10\text{ V}, V_{GS} = 4.5\text{ V}, I_D = 1.13\text{ A}$	N-Ch		0.65	1.0	nC
Gate-Source Charge	$Q_{gs}$		P-Ch		1.2	1.8	
Gate-Drain Charge	$Q_{gd}$	P-Channel $V_{DS} = -10\text{ V}, V_{GS} = -4.5\text{ V}, I_D = -0.88\text{ A}$	N-Ch		0.2		
			P-Ch		0.3		
Turn-On Delay Time	$t_{d(on)}$	N-Channel $V_{DD} = 10\text{ V}, R_L = 20\text{ }\Omega$ $I_D \cong 0.5\text{ A}, V_{GEN} = 4.5\text{ V}, R_g = 6\text{ }\Omega$	N-Ch		45	70	ns
			P-Ch		150	230	
Rise Time	$t_r$		N-Ch		85	130	
			P-Ch		480	720	
Turn-Off Delay Time	$t_{d(off)}$	P-Channel $V_{DD} = -10\text{ V}, R_L = 20\text{ }\Omega$ $I_D \cong -0.5\text{ A}, V_{GEN} = -4.5\text{ V}, R_g = 6\text{ }\Omega$	N-Ch		350	530	
			P-Ch		840	1200	
Fall Time	$t_f$		N-Ch		210	320	
			P-Ch		850	1200	

Notes:

a. Pulse test; pulse width  $\leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2\%$ .

b. Guaranteed by design, not subject to production testing.