

# MOSFET – Power, P-Channel Single ECH8

**-30 V, -9 A, 17 mΩ**

## ECH8310

### Features

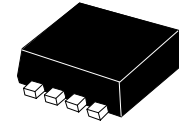
- 4 V Drive
- Halogen free compliance
- Protection diode in
- This Device is Pb-Free, Halogen Free and RoHS Compliant

### Specifications

#### ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub> = 25°C)

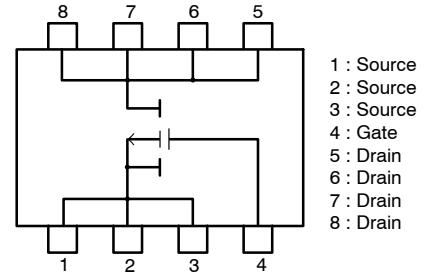
Symbol	Parameter	Conditions	Ratings	Unit
V <sub>DSS</sub>	Drain-to-Source Voltage		-30	V
V <sub>GSS</sub>	Gate-to-Source Voltage		±20	V
I <sub>D</sub>	Drain Current (DC)		-9	A
I <sub>DP</sub>	Drain Current (Pulse)	PW ≤ 10 μs, duty cycle ≤ 1%	-60	A
P <sub>D</sub>	Allowable Power Dissipation	When mounted on ceramic substrate (900 mm <sup>2</sup> X 0.8 mm)	1.5	W
T <sub>ch</sub>	Channel Temperature		150	°C
T <sub>stg</sub>	Storage Temperature		-55 to +150	°C

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

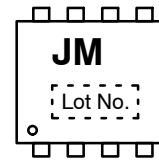


SOT-28FL/ECH8  
CASE 318BF

### ELECTRICAL CONNECTION



### MARKING DIAGRAM



### ORDERING INFORMATION

Device	Package	Shipping <sup>†</sup>
ECH8310-TL-H	SOT-28FL ECH8 (Pb-Free)	3000 / Tape & Reel

<sup>†</sup>For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, [BRD8011/D](#).

# ECH8310

## ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ )

Symbol	Parameter	Conditions	Ratings			Unit
			Min	Typ	Max	
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	$I_D = -1 \text{ mA}, V_{GS} = 0 \text{ V}$	-30	-	-	V
$I_{DSS}$	Zero-Gate Voltage Drain Current	$V_{DS} = -30 \text{ V}, V_{GS} = 0 \text{ V}$	-	-	-1	$\mu\text{A}$
$I_{GSS}$	Gate-to-Source Leakage Current	$V_{GS} = \pm 16 \text{ V}, V_{DS} = 0 \text{ V}$	-	-	$\pm 10$	$\mu\text{A}$
$V_{GS(off)}$	Cutoff Voltage	$V_{DS} = -10 \text{ V}, I_D = -1 \text{ mA}$	-1.2	-	-2.6	V
$ y_{fs} $	Forward Transfer Admittance	$V_{DS} = -10 \text{ V}, I_D = -4.5 \text{ A}$	-	12	-	S
$R_{DS(on)1}$	Static Drain to Source On-State Resistance	$I_D = -4.5 \text{ A}, V_{GS} = -10 \text{ V}$	9	13	17	$\text{m}\Omega$
$R_{DS(on)2}$		$I_D = -2 \text{ A}, V_{GS} = -4.5 \text{ V}$	12	20	28	$\text{m}\Omega$
$R_{DS(on)3}$		$I_D = -2 \text{ A}, V_{GS} = -4.0 \text{ V}$	13.5	23	32.5	$\text{m}\Omega$
$C_{iss}$	Input Capacitance	$V_{DS} = -10 \text{ V}, f = 1 \text{ MHz}$	-	1400	-	$\text{pF}$
$C_{oss}$	Output Capacitance		-	350	-	$\text{pF}$
$C_{rss}$	Reverse Transfer Capacitance		-	250	-	$\text{pF}$
$t_{d(on)}$	Turn-ON Delay Time	See specified Test Circuit.	-	10	-	ns
$t_r$	Rise Time		-	45	-	ns
$t_{d(off)}$	Turn-OFF Delay Time		-	134	-	ns
$t_f$	Fall Time		-	87	-	ns
$Q_g$	Total Gate Charge	$V_{DS} = -15 \text{ V}, V_{GS} = -10 \text{ V}, I_D = -9 \text{ A}$	-	28	-	nC
$Q_{gs}$	Gate-to-Source Charge		-	4	-	nC
$Q_{gd}$	Gate-to-Drain "Miller" Charge		-	6	-	nC
$V_{SD}$	Diode Forward Voltage	$I_S = -9 \text{ A}, V_{GS} = 0 \text{ V}$	-	-0.8	-1.2	V

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

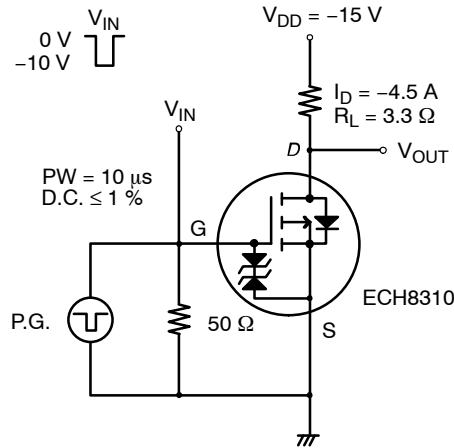
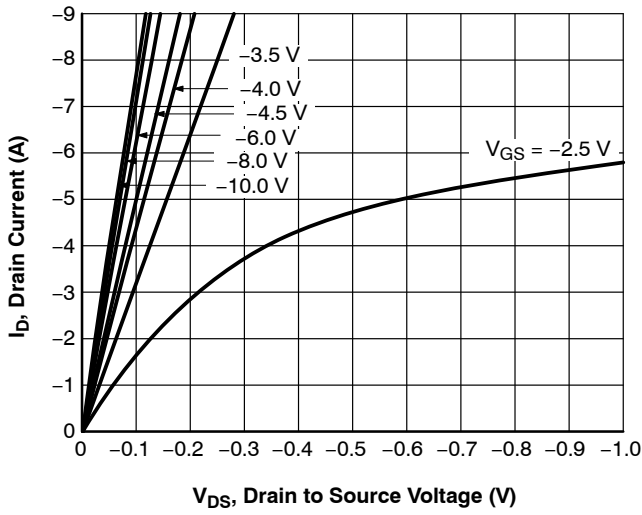


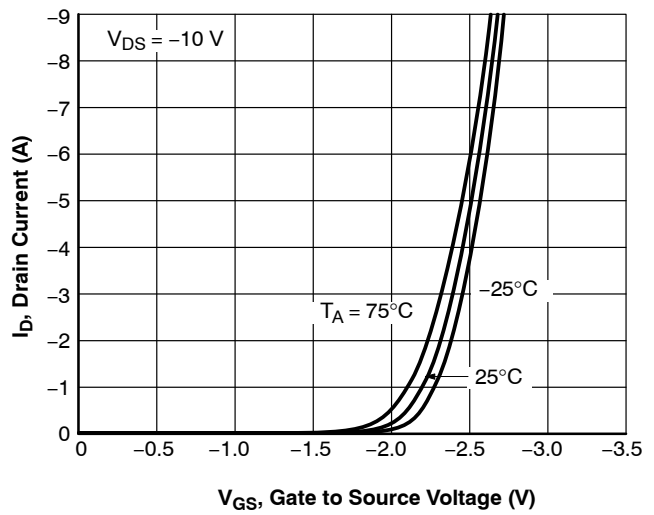
Figure 1. Switching Time Test Circuit

TYPICAL CHARACTERISTICS



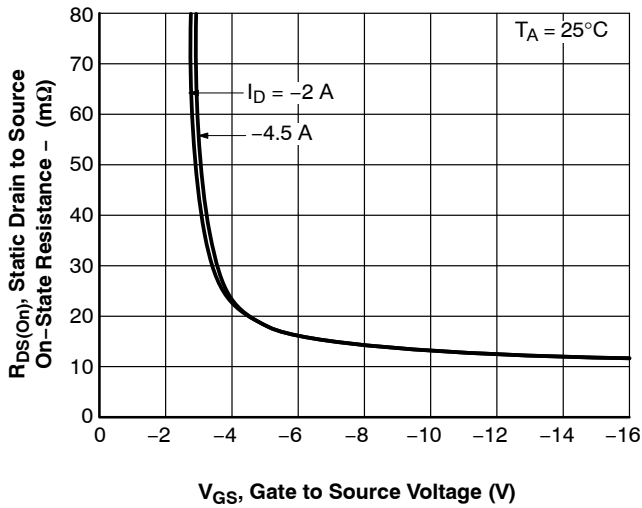
$V_{DS}$ , Drain to Source Voltage (V)

Figure 2.  $I_D - V_{DS}$



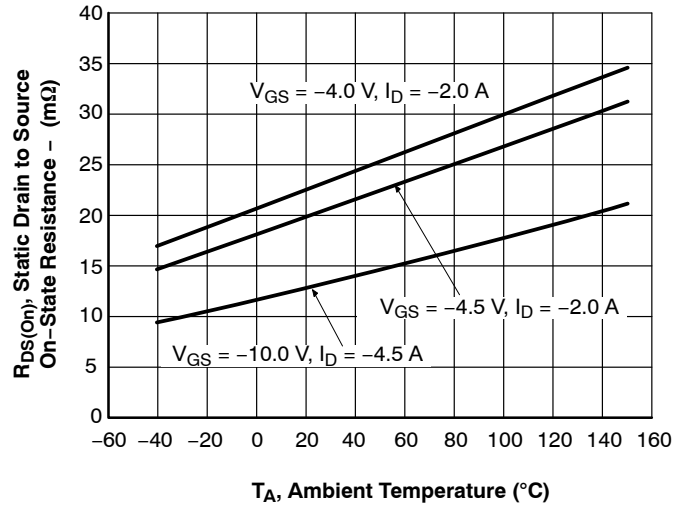
$V_{GS}$ , Gate to Source Voltage (V)

Figure 3.  $I_D - V_{GS}$



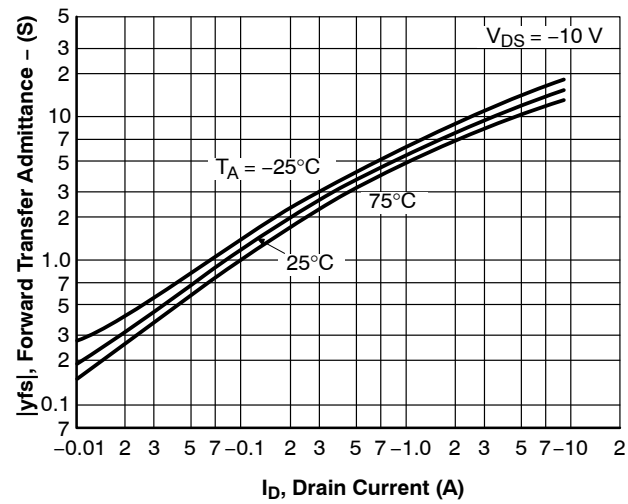
$V_{GS}$ , Gate to Source Voltage (V)

Figure 4.  $R_{DS(on)} - V_{GS}$



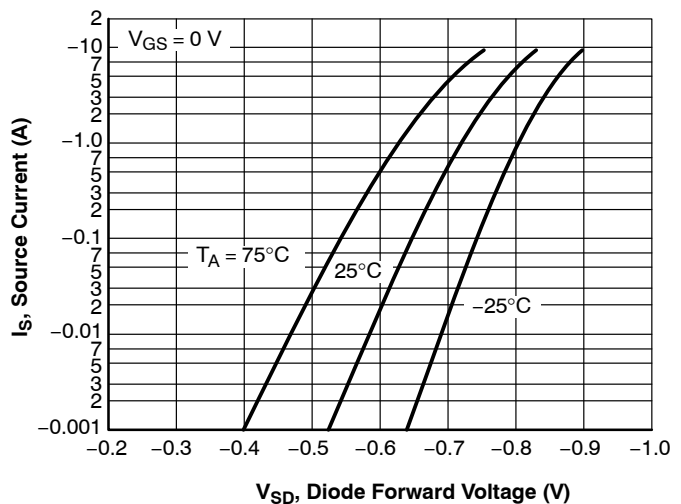
$T_A$ , Ambient Temperature ( $^{\circ}C$ )

Figure 5.  $R_{DS(on)} - T_A$



$I_D$ , Drain Current (A)

Figure 6.  $|Y_{fs}| - I_D$



$V_{SD}$ , Diode Forward Voltage (V)

Figure 7.  $I_S - V_{SD}$

# ECH8310

## TYPICAL CHARACTERISTICS (CONTINUED)

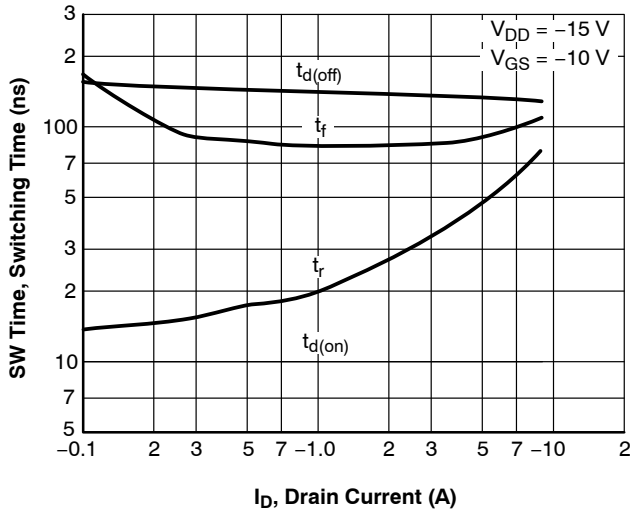


Figure 8.  $I_D - S/W$  Time

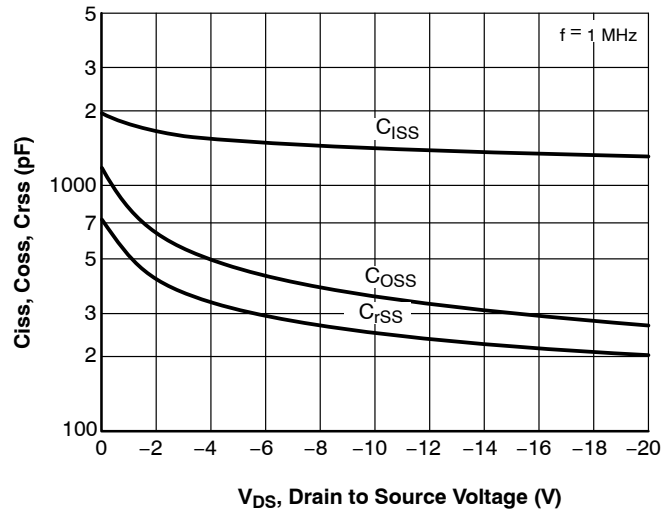


Figure 9.  $C_{iss}, C_{oss}, C_{rss} - V_{DS}$

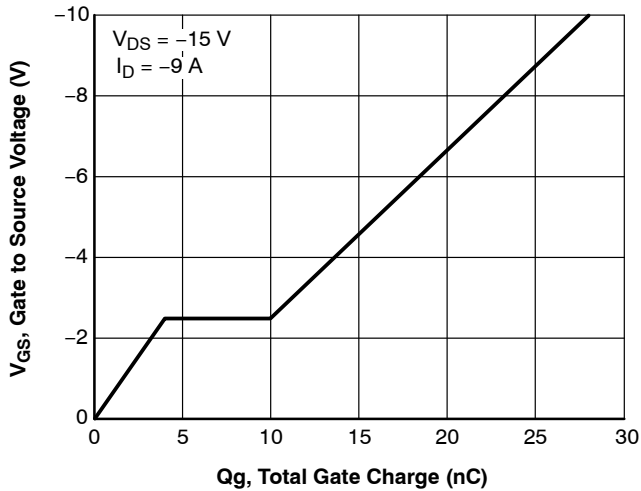


Figure 10.  $V_{GS} - Q_g$

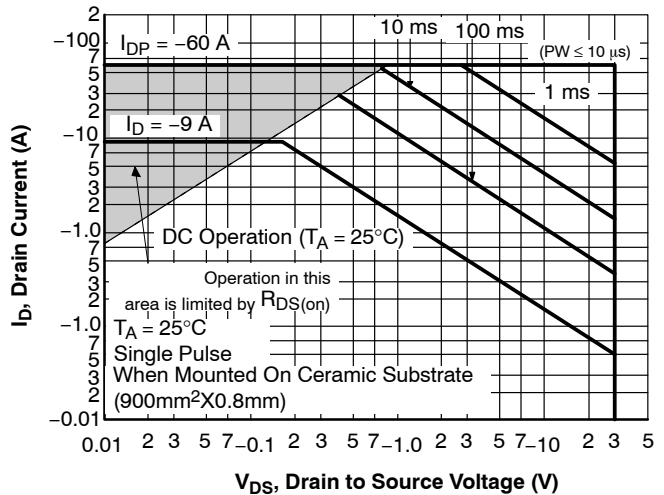


Figure 11. S O A

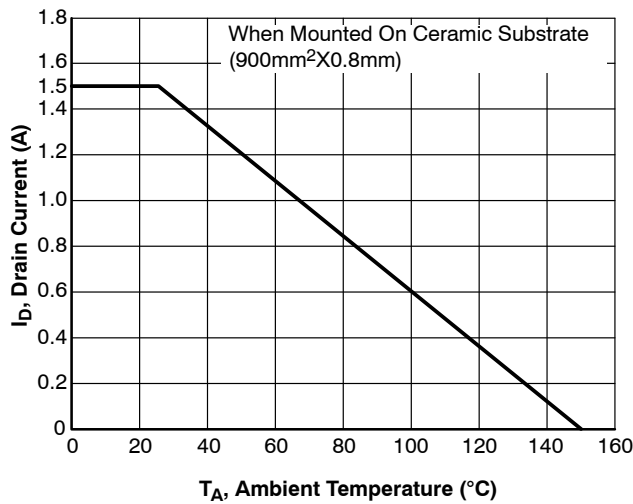


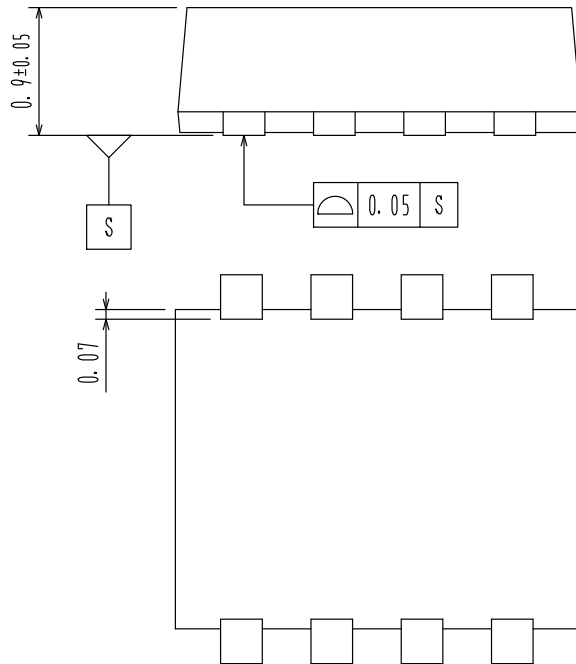
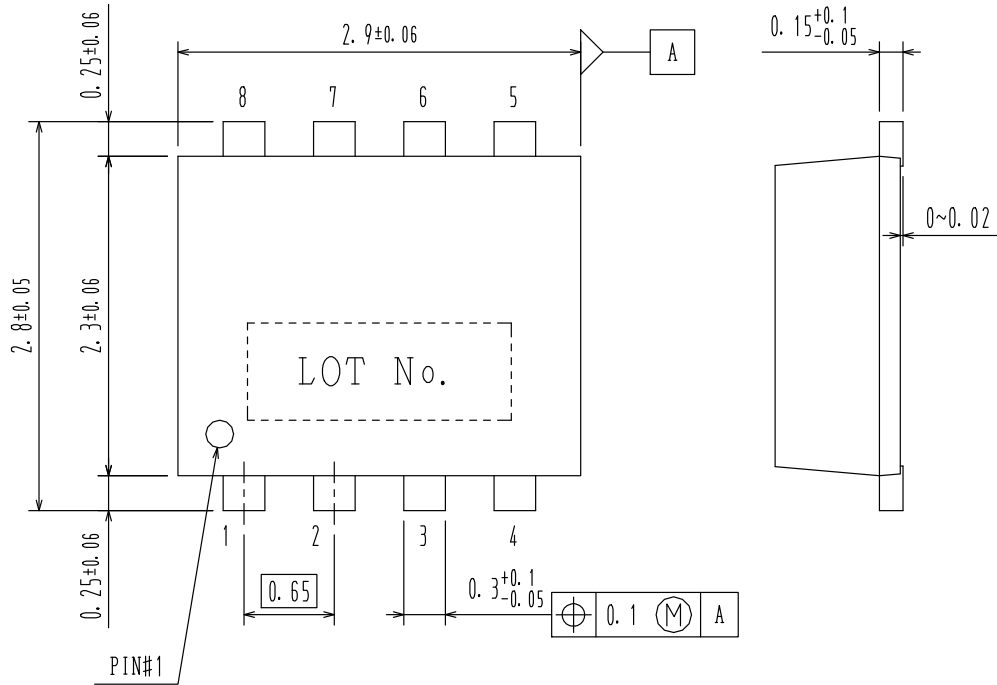
Figure 12.  $I_D - T_A$

Note on usage : Since the ECH8310 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

**MECHANICAL CASE OUTLINE**  
**PACKAGE DIMENSIONS**

**SOT-28FL / ECH8**  
**CASE 318BF**  
**ISSUE O**

DATE 31 MAR 2012



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