# onsemi

# MOSFET – Power, Single, P-Channel

-30 V, 25 mΩ, -7,5 A

# ECH8315

#### Description

This Power MOSFET is produced using **onsemi**'s trench technology, which is specifically designed to low on resistance. This devices is suitable for applications with low on resistance requirements.

## Features

- Low On–Resistance
- 4 V Drive
- ESD Diode-Protected Gate
- Pb-Free, Halogen Free and RoHS Compliant

# **Typical Applications**

- Load Switch
- Protection Switch for Lithium-ion Battery
- Motor Driver

## ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

Parameter	Symbol	Value	Unit
Drain to Source Voltage	V <sub>DSS</sub>	-30	V
Gate to Source Voltage	V <sub>GSS</sub>	±20	V
Drain Current (DC)	I <sub>D</sub>	-7.5	А
Drain Current (Pulse) PW $\leq$ 10 $\mu$ s, duty cycle $\leq$ 1%	I <sub>DP</sub>	-40	A
Power Dissipation When mounted on ceramic substrate (900 mm <sup>2</sup> x 0.8 mm)	P <sub>D</sub>	1.5	W
Junction Temperature	Tj	150	°C
Storage Temperature	Tstg	-55 to +150	°C
When mounted on ceramic substrate   (900 mm² x 0.8 mm)   Junction Temperature   Storage Temperature	Tj Tstg	150	°C °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.

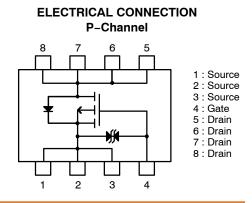
#### THERMAL CHARACTERISTICS

Parameter	Symbol	Value	Unit
Junction to Ambient When mounted on ceramic substrate (900 mm <sup>2</sup> x 0.8 mm)	$R_{\theta JA}$	83.3	°C/W

V <sub>DSS</sub>	R <sub>DS(on)</sub> Max	I <sub>D</sub> Max
–30 V	25 mΩ @ –10 V	–7.5 A
	44 mΩ @ −4.5 V	
	49 mΩ @ –4 V	



SOT-28FL/ECH8 CASE 318BF



#### MARKING DIAGRAM



# **ORDERING INFORMATION**

See detailed ordering and shipping information on page 5 of this data sheet.

# **ELECTRICAL CHARACTERISTICS** (Ta = 25°C)

			Value			<u> </u>
Parameter	Symbol	Conditions	Min	Тур	Max	Unit
Drain to Source Breakdown Voltage	V <sub>(BR)DSS</sub>	$I_D = -1 \text{ mA}, V_{GS} = 0 \text{ V}$	-30	-	-	V
Zero-Gate Voltage Drain Current	I <sub>DSS</sub>	$V_{DS} = -30$ V, $V_{GS} = 0$ V	-	-	-1	μA
Gate to Source Leakage Current	I <sub>GSS</sub>	$I_{GSS}$ $V_{GS} = \pm 16$ V, $V_{DS} = 0$ V		-	±10	μA
Gate Threshold Voltage	V <sub>GS(th)</sub>	$V_{GS(th)}$ $V_{DS} = -10 \text{ V}, \text{ I}_{D} = -1 \text{ mA}$		-	-2.6	V
Forward Transconductance	9 <sub>FS</sub>	$V_{DS} = -10 \text{ V}, \text{ I}_{D} = -3.5 \text{ A}$	5	8.4	-	S
Static Drain to Source On-State Resistance	R <sub>DS(on)</sub>	$I_D = -3.5 \text{ A}, \text{ V}_{GS} = -10 \text{ V}$	-	19	25	mΩ
		$I_D = -2 \text{ A}, \text{ V}_{GS} = -4.5 \text{ V}$	_	31	44	mΩ
		$I_D = -2 \text{ A}, V_{GS} = -4 \text{ V}$	_	35	49	mΩ
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = -10 V, f = 1 MHz	_	875	-	pF
Output Capacitance	C <sub>oss</sub>		_	200	-	1
Reverse Transfer Capacitance	C <sub>rss</sub>		_	150	-	1
Turn-ON Delay Time	t <sub>d(on)</sub>	See Figure 1	_	8.1	-	ns
Rise Time	t <sub>r</sub>		_	33	-	ns
Turn-OFF Delay Time	t <sub>d(off)</sub>		_	92	-	ns
Fall Time	t <sub>f</sub>		_	60	-	ns
Total Gate Charge	Qg		-	18	-	nC
Gate to Source Charge	Qgs	$V_{DS}$ = -15 V, $V_{GS}$ = -10 V, $I_D$ = -7.5 A	-	2.1	-	nC
Gate to Drain "Miller" Charge	Qgd	1	-	4.7	-	nC
Forward Diode Voltage	V <sub>SD</sub>	I <sub>S</sub> = -7.5 A, V <sub>GS</sub> = 0 V	-	-0.82	-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.

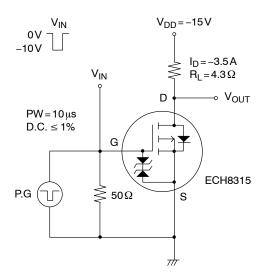
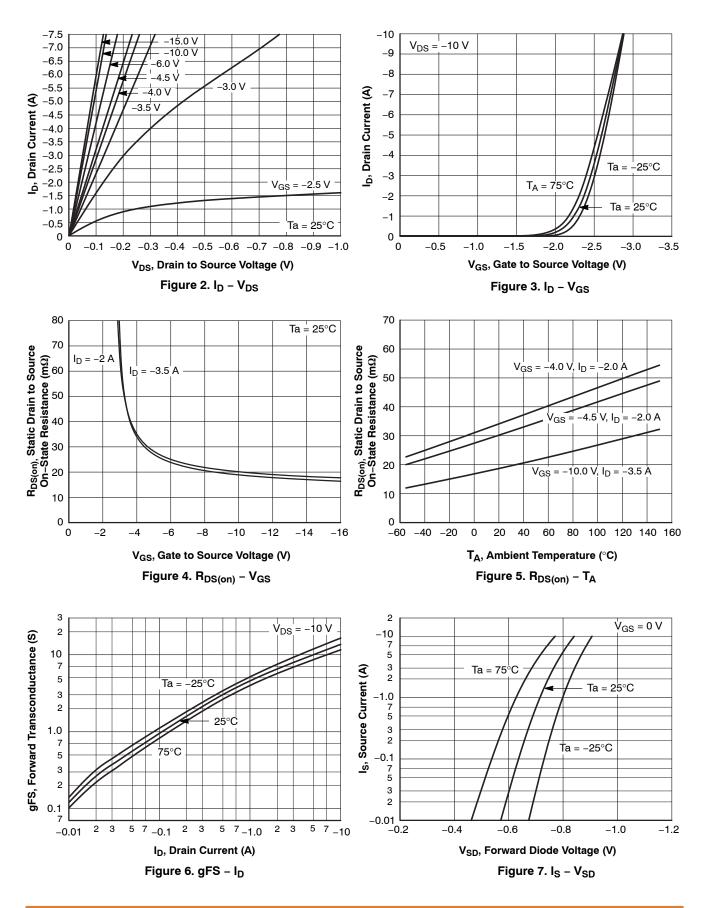
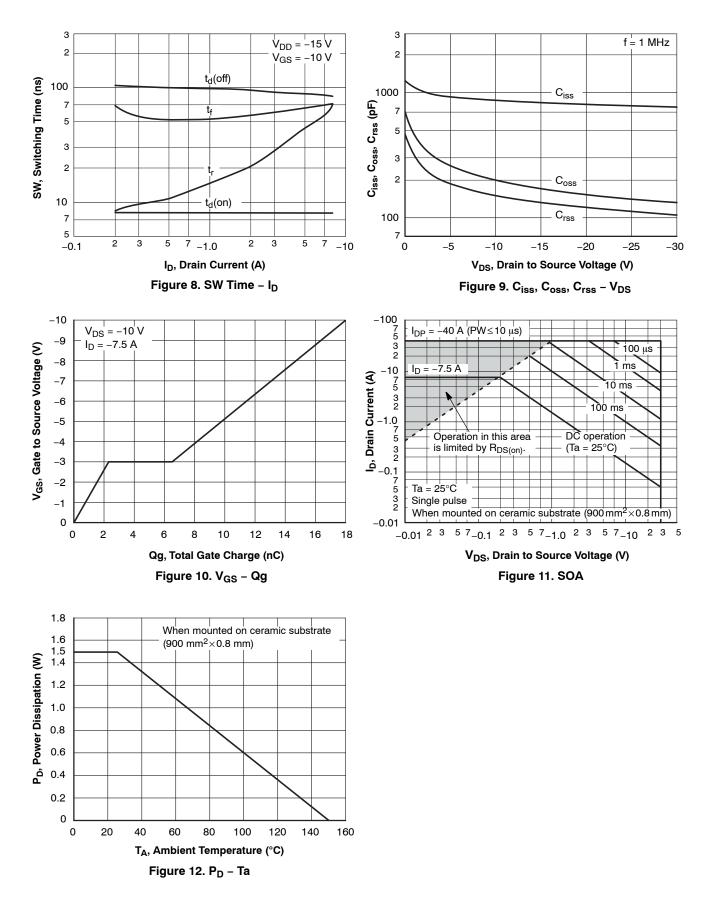


Figure 1. Switching Time Test Circuit 1

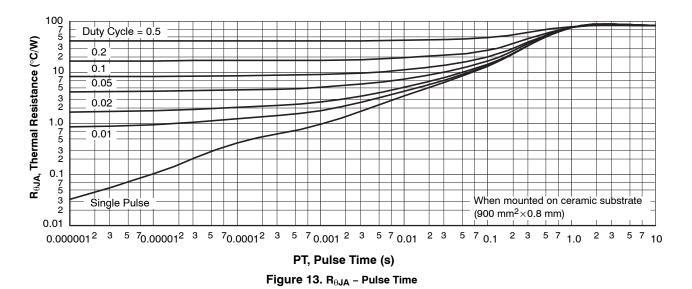
# **TYPICAL CHARACTERISTICS**



#### TYPICAL CHARACTERISTICS (continued)



# TYPICAL CHARACTERISTICS (CONTINUED)



#### **ORDERING INFORMATION**

Product Number	Marking	Package	Shipping (Qty / Packing) <sup>†</sup>
ECH8315-TL-H	JS	SOT–28FL / ECH8 (Pb–Free / Halogen Free)	3000 / Tape and Reel

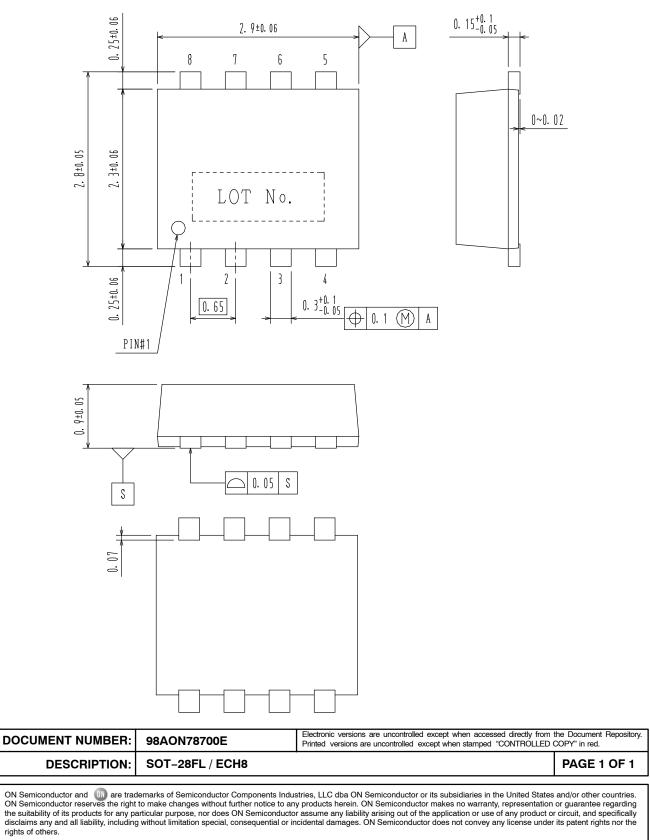
+For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, <u>BRD8011/D</u>.

Note on usage : Since the ECH8315 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.



SOT-28FL / ECH8 CASE 318BF ISSUE O

DATE 31 MAR 2012



onsemi, ONSEMI, and other names, marks, and brands are registered and/or common law trademarks of Semiconductor Components Industries, LLC dba "onsemi" or its affiliates and/or subsidiaries in the United States and/or other countries. onsemi owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of onsemi's product/patent coverage may be accessed at <u>www.onsemi.com/site/pdf/Patent-Marking.pdf</u>. onsemi reserves the right to make changes at any time to any products or information herein, without notice. The information herein is provided "as-is" and onsemi makes no warranty, representation or guarantee regarding the accuracy of the information, product features, availability, functionality, or suitability of its products for any particular purpose, nor does onsemi assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or indental damages. Buyer is responsible for its products and applications using onsemi products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by onsemi. "Typical" parameters which may be provided in onsemi data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. onsemi does not convey any license under any of its intellectual property rights nor the rights of others. onsemi products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification. Buyer shall indemnify and hold onsemi and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs,

#### ADDITIONAL INFORMATION

TECHNICAL PUBLICATIONS:

Technical Library: www.onsemi.com/design/resources/technical-documentation onsemi Website: www.onsemi.com ONLINE SUPPORT: <u>www.onsemi.com/support</u> For additional information, please contact your local Sales Representative at www.onsemi.com/support/sales