

**ECH8315**

## Power MOSFET -30V, 25mΩ, -7.5A, Single P-Channel

This Power MOSFET is produced using ON Semiconductor'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
- 4V drive
- ESD Diode-Protected Gate
- Pb-Free, Halogen Free and RoHS compliance

## Typical Applications

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

## SPECIFICATIONS

**ABSOLUTE MAXIMUM RATING** at  $T_a = 25^\circ\text{C}$  (Note 1)

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	A
Drain Current (Pulse) PW ≤ 10μs, duty cycle ≤ 1%	I <sub>DP</sub>	-40	A
Power Dissipation When mounted on ceramic substrate (900mm <sup>2</sup> × 0.8mm)	P <sub>D</sub>	1.5	W
Junction Temperature	T <sub>j</sub>	150	°C
Storage Temperature	T <sub>stg</sub>	-55 to +150	°C

Note 1 : 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 RESISTANCE RATINGS**

Parameter	Symbol	Value	Unit
Junction to Ambient When mounted on ceramic substrate (900mm <sup>2</sup> × 0.8mm)	R <sub>0JA</sub>	83.3	°C/W

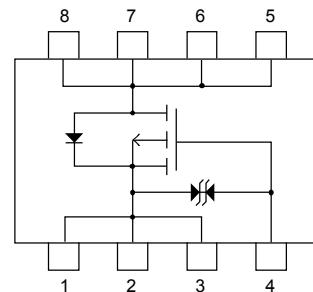


ON Semiconductor®

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V <sub>DSS</sub>	R <sub>Ds(on)</sub> Max	I <sub>D</sub> Max
-30V	25m $\Omega$ @ -10V	-7.5A
	44m $\Omega$ @ -4.5V	
	49m $\Omega$ @ -4V	

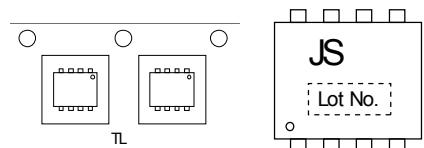
## **ELECTRICAL CONNECTION P-Channel**



1 : Source  
2 : Source  
3 : Source  
4 : Gate  
5 : Drain  
6 : Drain  
7 : Drain  
8 : Drain

**PACKING TYPE : TL**

## MARKING



## ORDERING INFORMATION

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

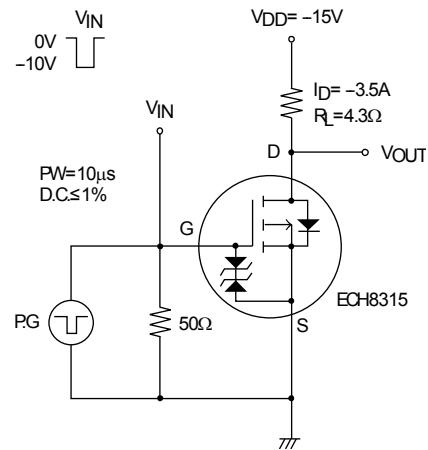
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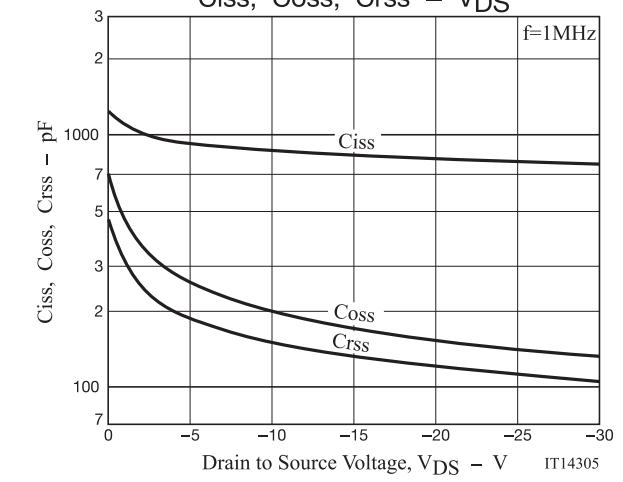
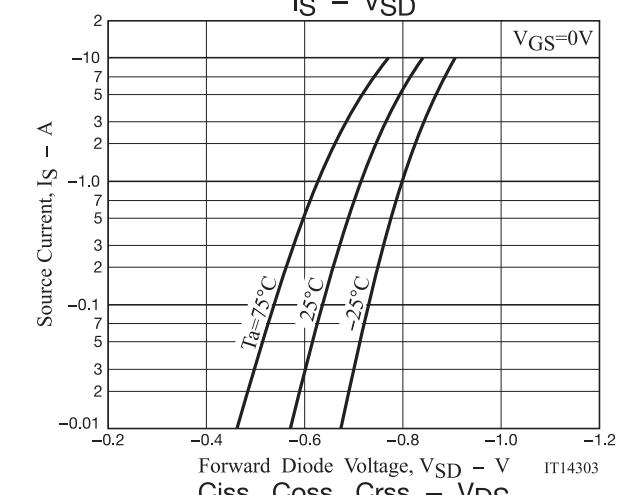
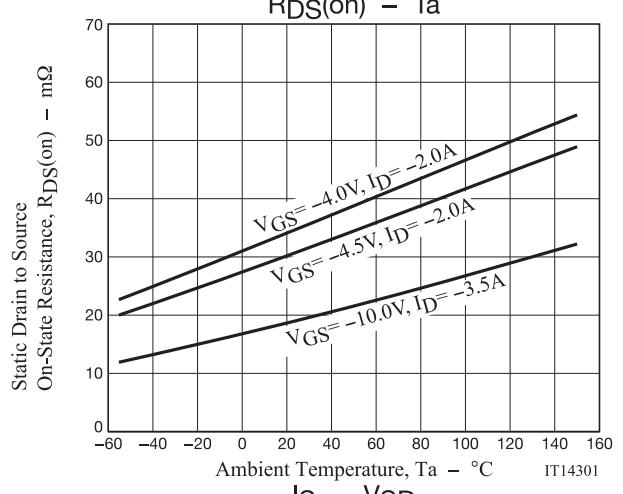
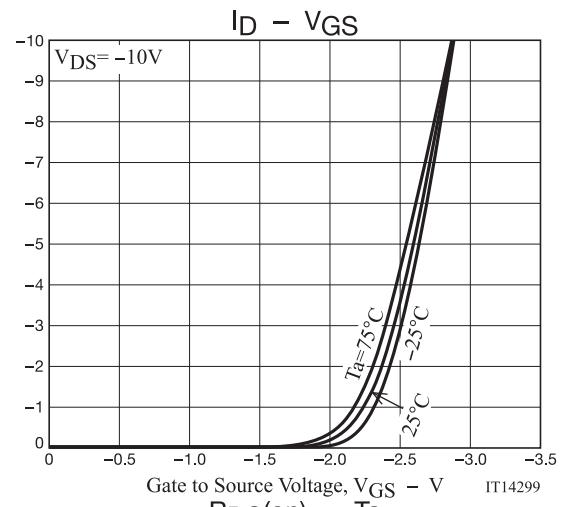
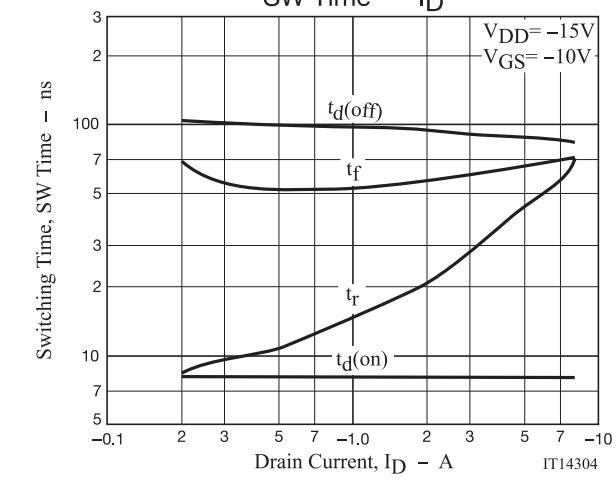
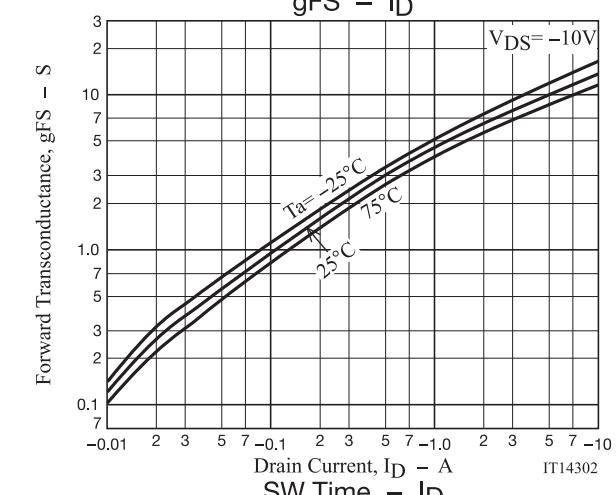
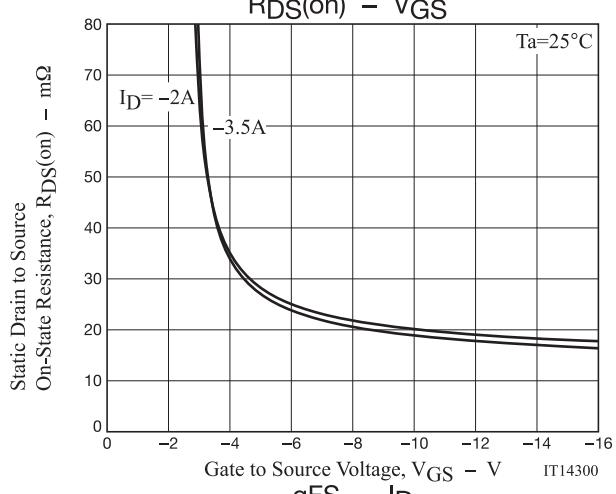
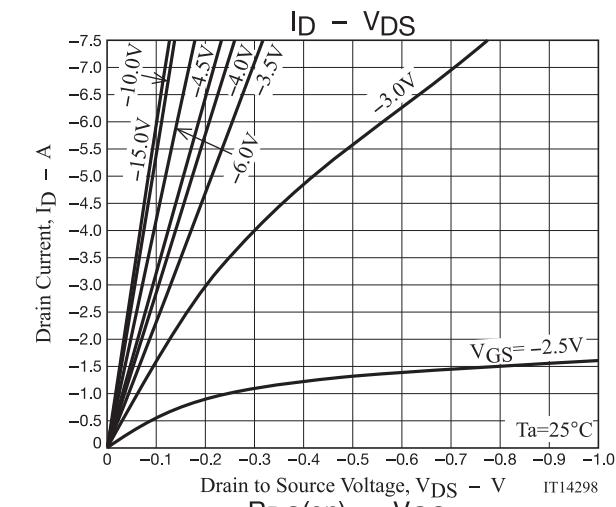
## ELECTRICAL CHARACTERISTICS at $T_a = 25^\circ\text{C}$ (Note 2)

Parameter	Symbol	Conditions	Value			Unit
			min	typ	max	
Drain to Source Breakdown Voltage	$V(\text{BR})_{\text{DSS}}$	$I_D = -1\text{mA}, V_{GS} = 0\text{V}$	-30			V
Zero-Gate Voltage Drain Current	$I_{\text{DSS}}$	$V_{DS} = -30\text{V}, V_{GS} = 0\text{V}$			-1	$\mu\text{A}$
Gate to Source Leakage Current	$I_{\text{GSS}}$	$V_{GS} = \pm 16\text{V}, V_{DS} = 0\text{V}$			$\pm 10$	$\mu\text{A}$
Gate Threshold Voltage	$V_{GS(\text{th})}$	$V_{DS} = -10\text{V}, I_D = -1\text{mA}$	-1.2		-2.6	V
Forward Transconductance	$g_{\text{FS}}$	$V_{DS} = -10\text{V}, I_D = -3.5\text{A}$	5	8.4		S
Static Drain to Source On-State Resistance	$R_{DS(\text{on})1}$	$I_D = -3.5\text{A}, V_{GS} = -10\text{V}$		19	25	$\text{m}\Omega$
	$R_{DS(\text{on})2}$	$I_D = -2\text{A}, V_{GS} = -4.5\text{V}$		31	44	$\text{m}\Omega$
	$R_{DS(\text{on})3}$	$I_D = -2\text{A}, V_{GS} = -4\text{V}$		35	49	$\text{m}\Omega$
Input Capacitance	$C_{\text{iss}}$	$V_{DS} = -10\text{V}, f = 1\text{MHz}$		875		$\text{pF}$
Output Capacitance	$C_{\text{oss}}$			200		$\text{pF}$
Reverse Transfer Capacitance	$C_{\text{rss}}$			150		$\text{pF}$
Turn-ON Delay Time	$t_{\text{d(on)}}$	See specified Test Circuit		8.1		ns
Rise Time	$t_r$			33		ns
Turn-OFF Delay Time	$t_{\text{d(off)}}$			92		ns
Fall Time	$t_f$			60		ns
Total Gate Charge	$Q_g$	$V_{DS} = -15\text{V}, V_{GS} = -10\text{V}, I_D = -7.5\text{A}$		18		$\text{nC}$
Gate to Source Charge	$Q_{gs}$			2.1		$\text{nC}$
Gate to Drain "Miller" Charge	$Q_{gd}$			4.7		$\text{nC}$
Forward Diode Voltage	$V_{SD}$	$I_S = -7.5\text{A}, V_{GS} = 0\text{V}$		-0.82	-1.2	V

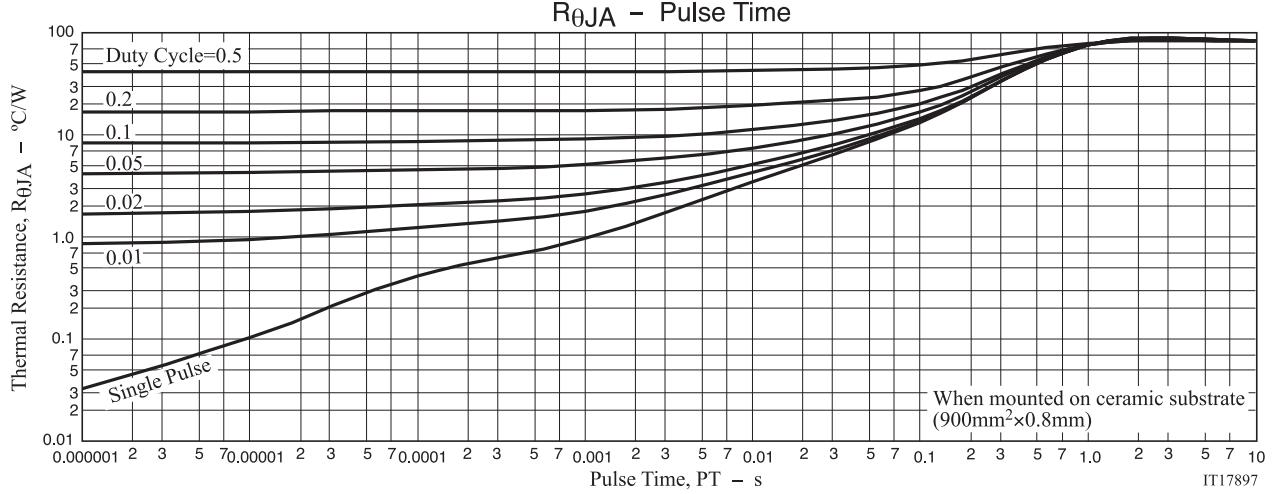
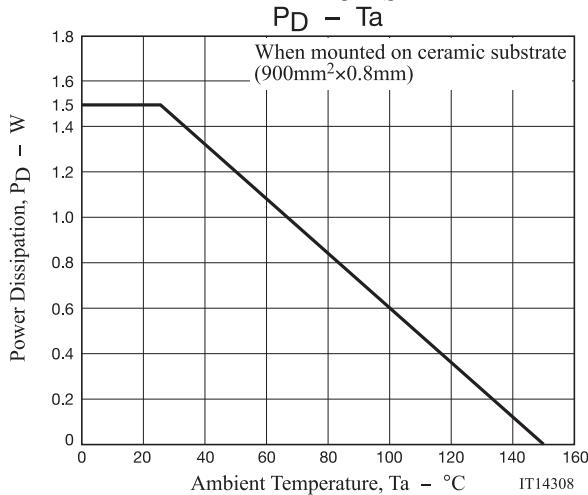
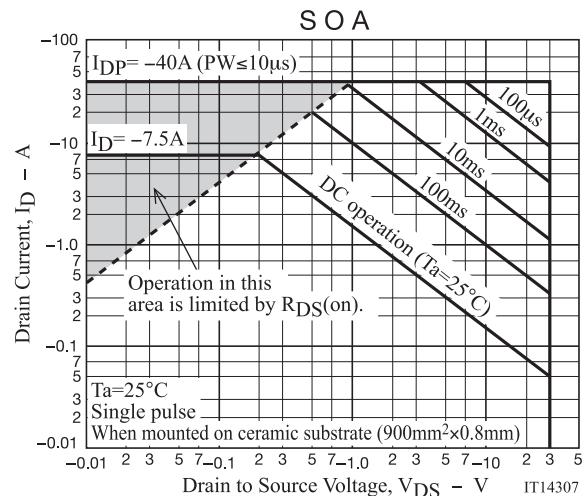
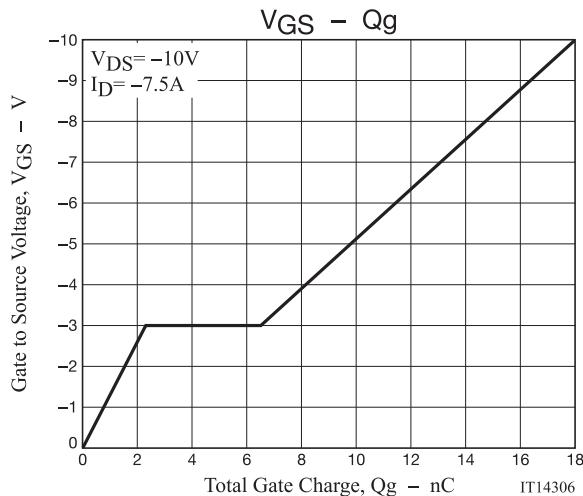
Note 2 : Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted.  
Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

## Switching Time Test Circuit





# ECH8315

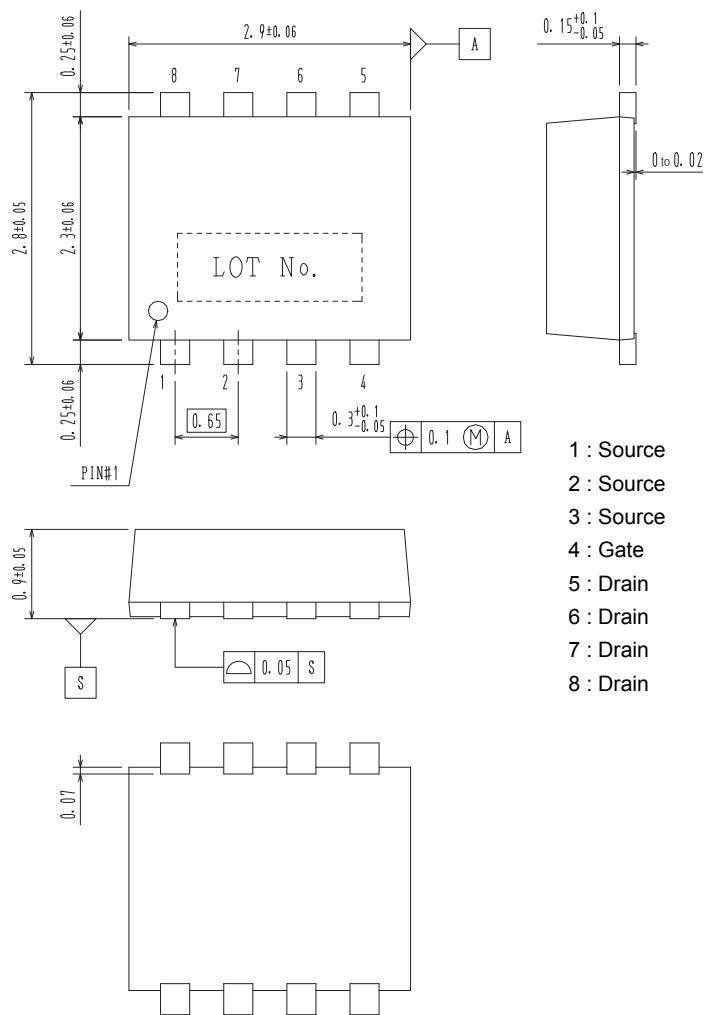


# ECH8315

## PACKAGE DIMENSIONS

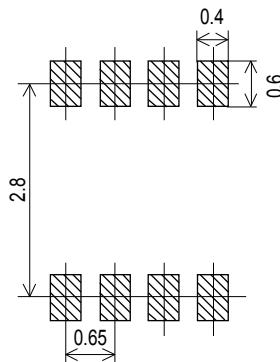
unit : mm

SOT-28FL / ECH8  
CASE 318BF  
ISSUE O



1 : Source  
2 : Source  
3 : Source  
4 : Gate  
5 : Drain  
6 : Drain  
7 : Drain  
8 : Drain

### Recommended Soldering Footprint



## ORDERING INFORMATION

Device	Marking	Package	Shipping (Qty / Packing)
ECH8315-TL-H	JS	SOT-28FL / ECH8 (Pb-Free / Halogen Free)	3,000 / Tape & Reel
ECH8315-TL-W			

† 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. [http://www.onsemi.com/pub\\_link/Collateral/BRD8011-D.PDF](http://www.onsemi.com/pub_link/Collateral/BRD8011-D.PDF)

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

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