

ECH8659

Power MOSFET 30V, 24mΩ, 7A, Dual N-Channel

This Power MOSFET is produced using ON Semiconductor's trench technology, which is specifically designed to minimize gate charge and low on resistance. This device is suitable for applications with low gate charge driving or low on resistance requirements.

Features

- 4V drive
- Composite type, Facilitating high-density mounting
- ESD Diode-Protected Gate
- Pb-Free, Halogen Free and RoHS compliance

Typical Applications

- LiB Protection Switch
- Motor Drive

SPECIFICATIONS

ABSOLUTE MAXIMUM RATING at Ta = 25°C (Note 1)

Parameter	Symbol	Value	Unit
Drain to Source Voltage	V _{DSS}	30	V
Gate to Source Voltage	V _{GSS}	±20	V
Drain Current (DC)	I _D	7	A
Drain Current (Pulse) PW ≤ 10μs, duty cycle ≤ 1%	I _{DP}	40	A
Power Dissipation When mounted on ceramic substrate (900mm ² × 0.8mm) 1unit	P _D	1.3	W
Total Dissipation When mounted on ceramic substrate (900mm ² × 0.8mm)	P _T	1.5	W
Junction Temperature	T _J	150	°C
Storage Temperature	T _{stg}	-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 ² × 0.8mm) 1unit	R _{θJA}	96.1	°C/W

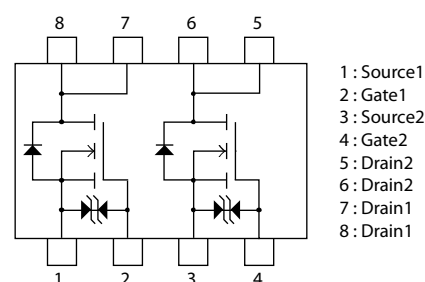


ON Semiconductor®

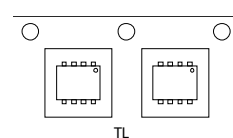
www.onsemi.com

V _{DSS}	R _{DS(on)} Max	I _D Max
30V	24mΩ@ 10V	7A
	41mΩ@ 4.5V	
	55mΩ@ 4V	

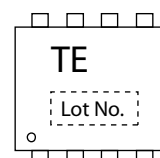
ELECTRICAL CONNECTION N-Channel



PACKING TYPE : TL



MARKING



ORDERING INFORMATION

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

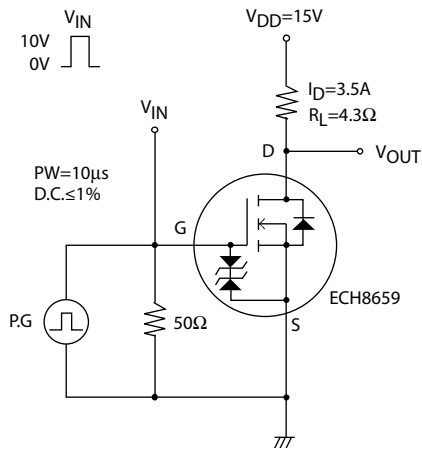
ECH8659

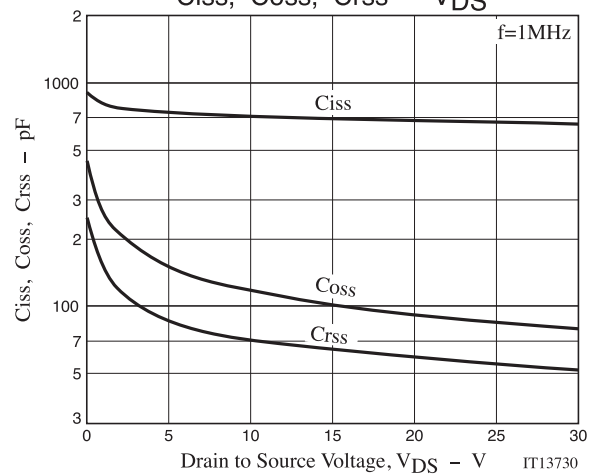
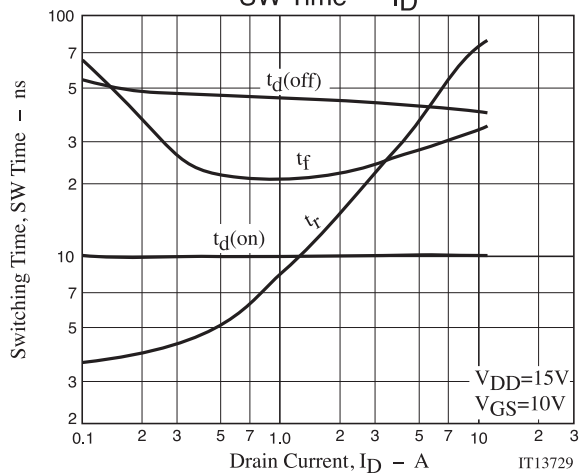
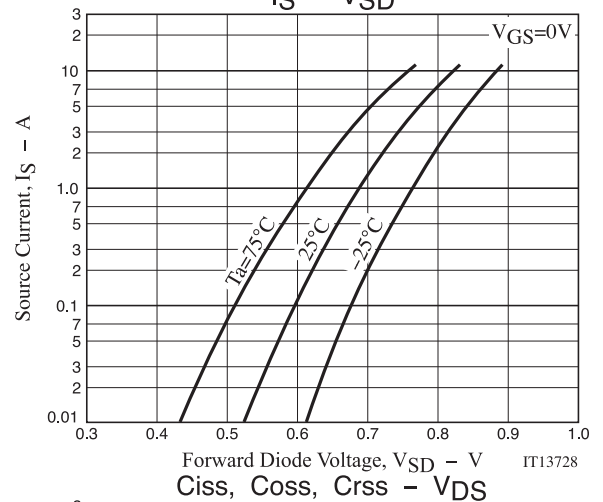
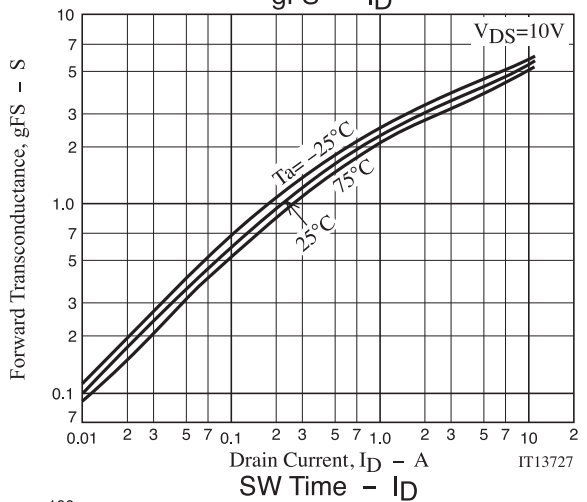
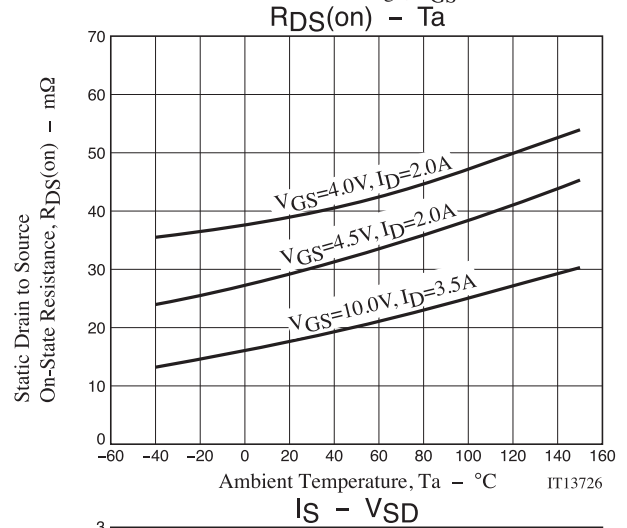
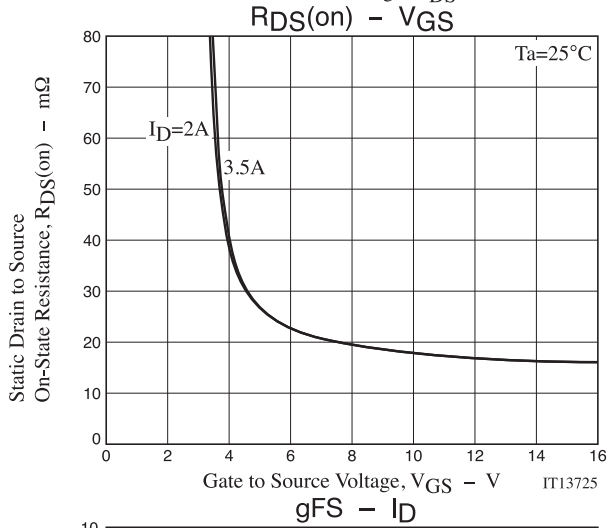
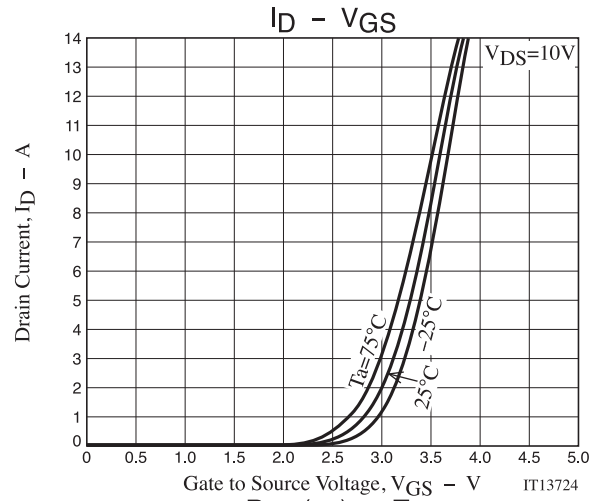
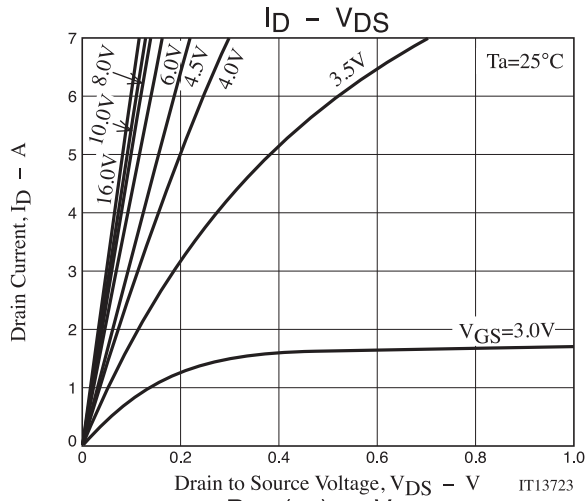
ELECTRICAL CHARACTERISTICS at Ta = 25°C (Note 2)

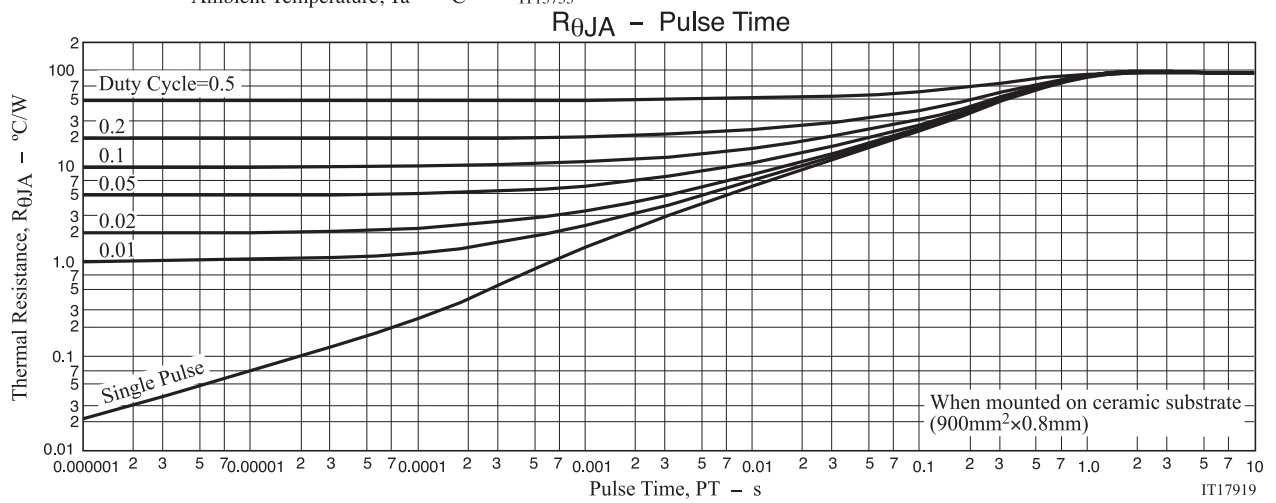
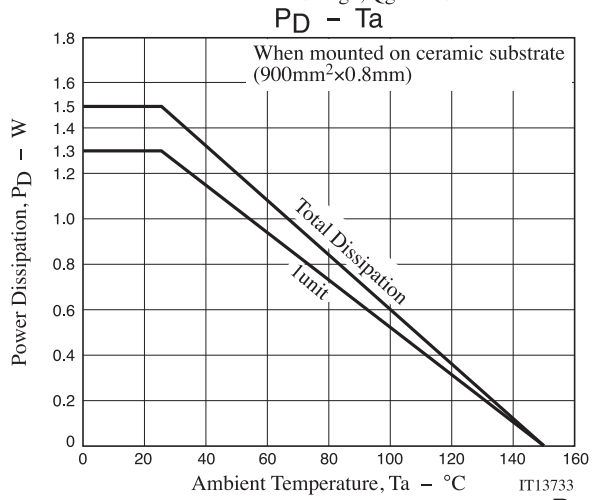
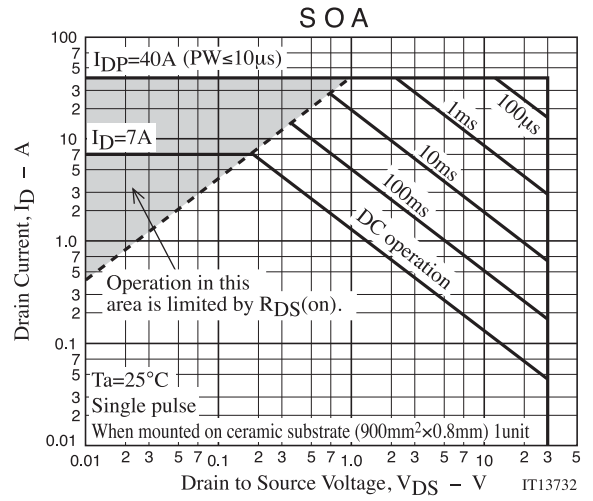
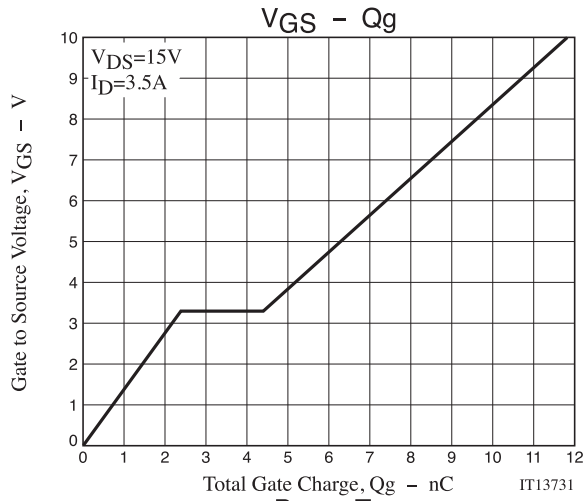
Parameter	Symbol	Conditions	Value			Unit
			min	typ	max	
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=1mA, V_{GS}=0V$	30			V
Zero-Gate Voltage Drain Current	I_{DSS}	$V_{DS}=30V, V_{GS}=0V$			1	μA
Gate to Source Leakage Current	I_{GSS}	$V_{GS}=\pm 16V, V_{DS}=0V$			± 10	μA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=10V, I_D=1mA$	1.2		2.6	V
Forward Transconductance	g_{FS}	$V_{DS}=10V, I_D=3.5A$	2.2	3.7		S
Static Drain to Source On-State Resistance	$R_{DS(on)1}$	$I_D=3.5A, V_{GS}=10V$		18	24	$m\Omega$
	$R_{DS(on)2}$	$I_D=2A, V_{GS}=4.5V$		29	41	$m\Omega$
	$R_{DS(on)3}$	$I_D=2A, V_{GS}=4V$		39	55	$m\Omega$
Input Capacitance	C_{iss}	$V_{DS}=10V, f=1MHz$		710		pF
Output Capacitance	C_{oss}			120		pF
Reverse Transfer Capacitance	C_{rss}			72		pF
Turn-ON Delay Time	$t_{d(on)}$	See specified Test Circuit		10		ns
Rise Time	t_r			25		ns
Turn-OFF Delay Time	$t_{d(off)}$			43		ns
Fall Time	t_f			25		ns
Total Gate Charge	Q_g	$V_{DS}=15V, V_{GS}=10V, I_D=3.5A$		11.8		nC
Gate to Source Charge	Q_{gs}			2.4		nC
Gate to Drain "Miller" Charge	Q_{gd}			2.0		nC
Forward Diode Voltage	V_{SD}	$I_S=7A, V_{GS}=0V$		0.79	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





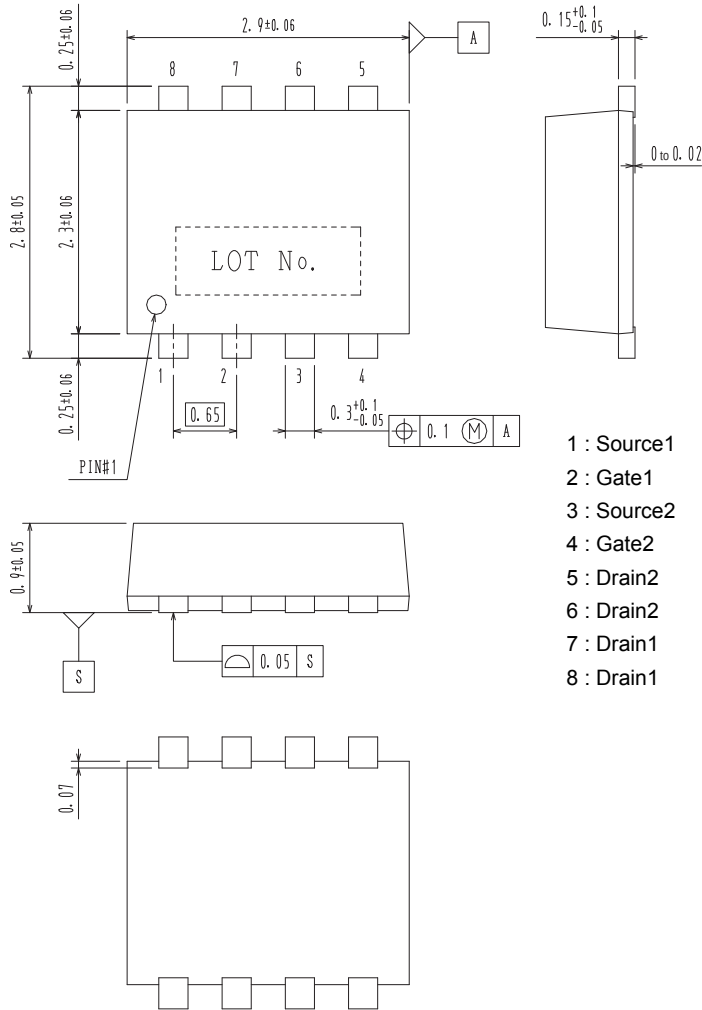


ECH8659

PACKAGE DIMENSIONS

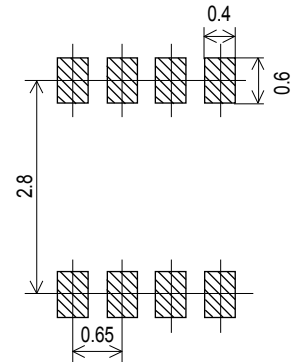
unit : mm

SOT-28FL / ECH8
CASE 318BF
ISSUE O



- 1 : Source1
- 2 : Gate1
- 3 : Source2
- 4 : Gate2
- 5 : Drain2
- 6 : Drain2
- 7 : Drain1
- 8 : Drain1

Recommended Soldering Footprint



ORDERING INFORMATION

Device	Marking	Package	Shipping (Qty / Packing)
ECH8659-TL-H	TE	SOT-28FL / ECH8 (Pb-Free / Halogen Free)	3,000 / Tape & Reel
ECH8659-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

Note on usage : Since the ECH8659 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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