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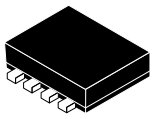
N-Channel Power MOSFET

24 V, 9 A, 16 mΩ, Dual ECH8

ECH8655R-R-TL-H



SOT−28FL / ECH8
CASE 318BF

Features

- Low ON−resistance
- 2.5 V Drive
- Common−drain Type
- Protection Diode in
- Built−in Gate Protection Resistor
- Best Suited for LiB Charging and Discharging Switch
- This Device is Pb−Free and are RoHS Compliant

Product & Package Information

- Package: ECH8
- JEITA, JEDEC: −
- Minimum Packing Quantity: 3,000 Pcs./Reel

Unit : mm (typ)
7011A−003

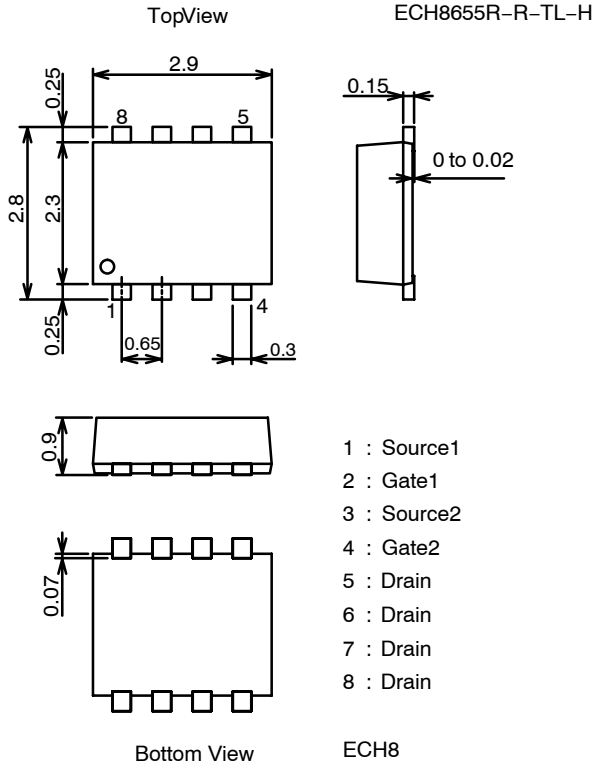
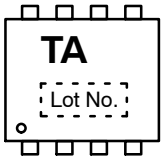
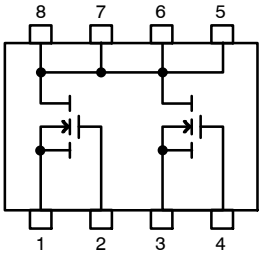


Figure 1. Package Dimensions

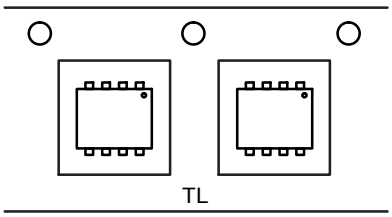
GENERIC MARKING DIAGRAM



ELECTRICAL CONNECTION



PACKING TYPE: TL



ORDERING INFORMATION

See detailed ordering and shipping information on page 3 of this data sheet.

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SPECIFICATIONS

ABSOLUTE MAXIMUM RATINGS at T_A = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Drain−to−Source Voltage	V_{DSS}		24	V
Gate−to−Source Voltage	V_{GSS}		±12	V
Drain Current (DC)	I_D		9	A
Drain Current (Pulse)	I_{DP}	PW ≤ 10 μs, duty cycle ≤ 1%	60	A
Allowable Power Dissipation	P_D	When mounted on ceramic substrate (900 mm^2 × 0.8 mm) 1 unit	1.4	W
Total Dissipation	P_T	When mounted on ceramic substrate (900 mm^2 × 0.8 mm)	1.5	W
Channel Temperature	T_{ch}		150	°C
Storage Temperature	T_{stg}		−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.

ELECTRICAL CHARACTERISTICS at T_A = 25°C

Parameter	Symbol	Conditions	Ratings			Unit
			Min	Typ	Max	
Drain−to−Source Breakdown Voltage	$V_{(BR)DSS}$	I_D = 1 mA, V_{GS} = 0 V	24			V
Zero−Gate Voltage Drain Current	I_{DSS}	V_{DS} = 20 V, V_{GS} = 0V			1	μA
Gate−to−Source Leakage Current	I_{GSS}	V_{GS} = ±8 V, V_{DS} = 0 V			±10	μA
Cutoff Voltage	V_{GS}(off)	V_{DS} = 10 V, I_D = 1 mA	0.5		1.3	V
Forward Transfer Admittance	| yfs |	V_{DS} = 10 V, I_D = 4.5 A	4.8	8		S
Static Drain−to−Source On−State Resistance	R_{DS}(on)1	I_D = 4.5 A, V_{GS} = 4.5 V	10	13	16	mΩ
	R_{DS}(on)2	I_D = 4.5 A, V_{GS} = 4.0 V	10.5	13.5	16.5	mΩ
	R_{DS}(on)3	I_D = 4.5 A, V_{GS} = 3.1 V	11	15	20	mΩ
	R_{DS}(on)4	I_D = 2 A, V_{GS} = 2.5 V	13	18	24	mΩ
Turn−ON Delay Time	t_d(on)	See specified Test Circuit.		320		ns
Rise Time	t_r			1100		ns
Turn−OFF Delay Time	t_d(off)			2400		ns
Fall Time	t_f			2100		ns
Total Gate Charge	Qg	V_{DS} = 10 V, V_{GS} = 10 V, I_D = 9 A		16.8		nC
Gate−to−Source Charge	Qgs			1.6		nC
Gate−to−Drain “Miller” Charge	Qgd			4.8		nC
Diode Forward Voltage	V_{SD}	I_S = 9 A, V_{GS} = 0 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.

Switching Time Test Circuit

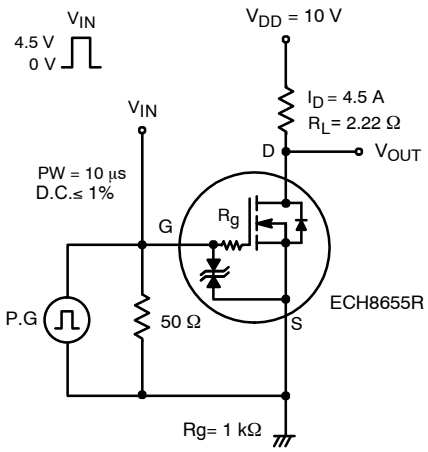


Figure 2. Switching Time Test Circuit

ORDERING INFORMATION

Device	Package	Shipping†	Memo
ECH8655R−R−TL−H	ECH8	3,000 pcs./reel	Pb Free and Halogen Free

†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.

TYPICAL CHARACTERISTICS

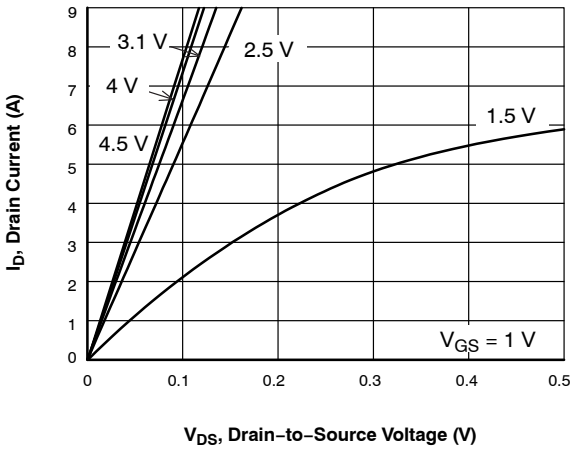


Figure 3. $I_D - V_{DS}$

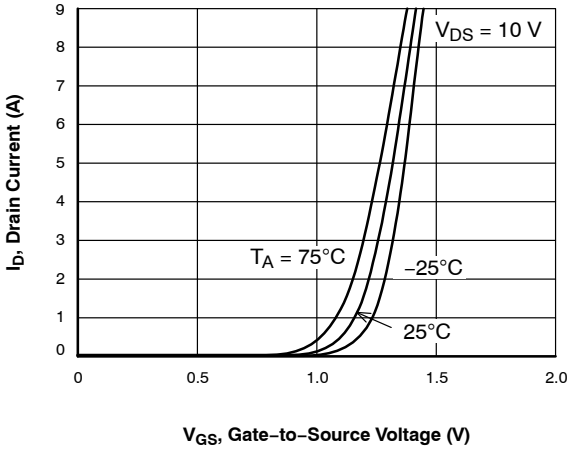


Figure 4. $I_D - V_{GS}$

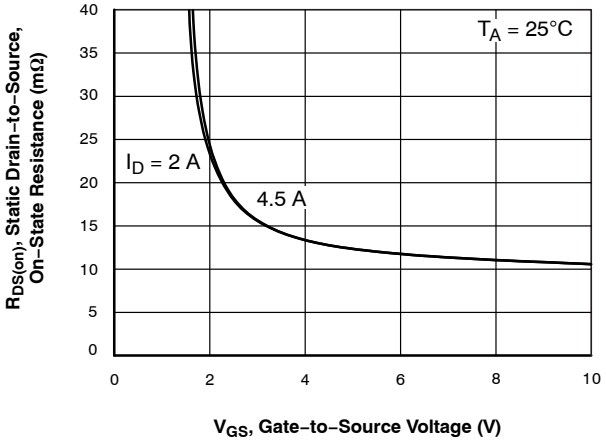


Figure 5. $R_{DS(on)} - V_{GS}$

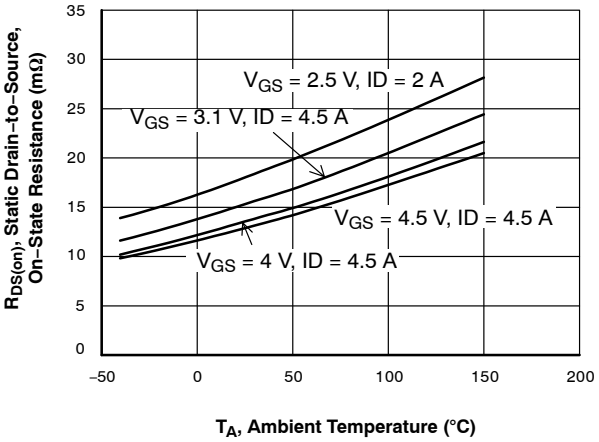


Figure 6. $R_{DS(on)} - T_A$

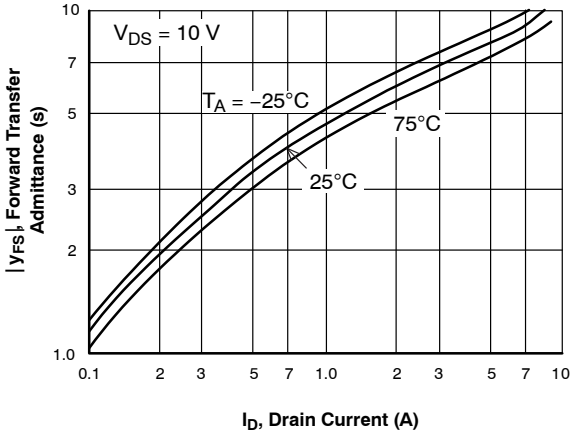


Figure 7. $|yfs| - I_D$

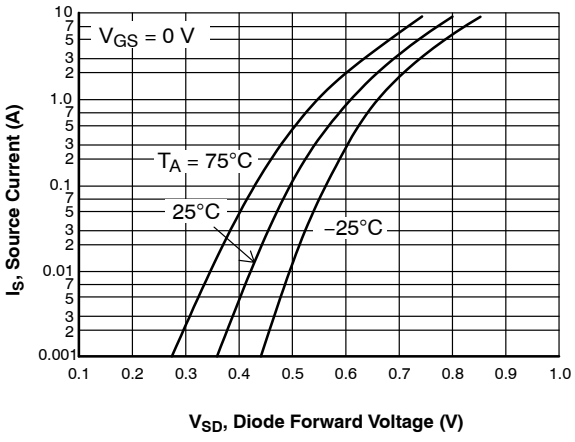


Figure 8. $I_S - V_{SD}$

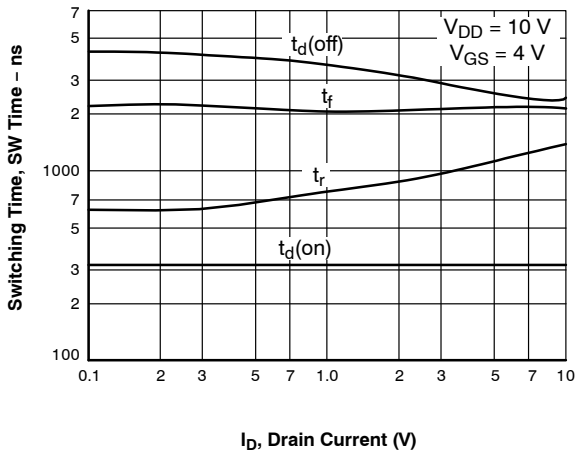


Figure 9. SW Time − I_D

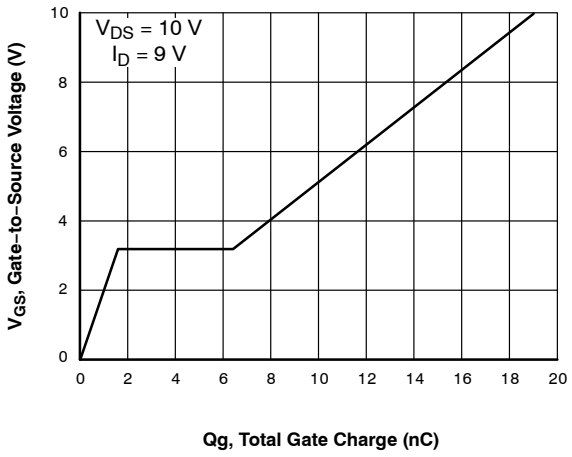


Figure 10. V_{GS} − Q_g

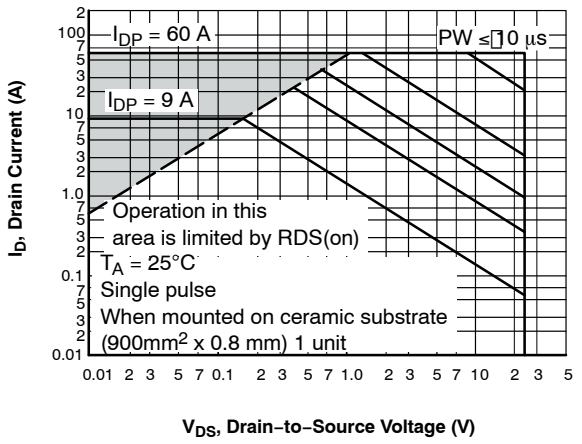


Figure 11. ASO

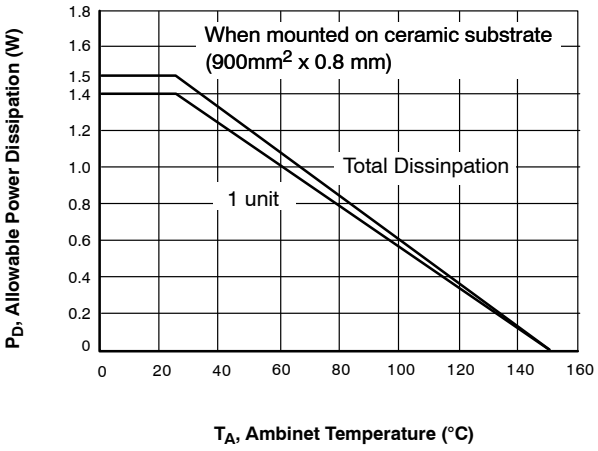
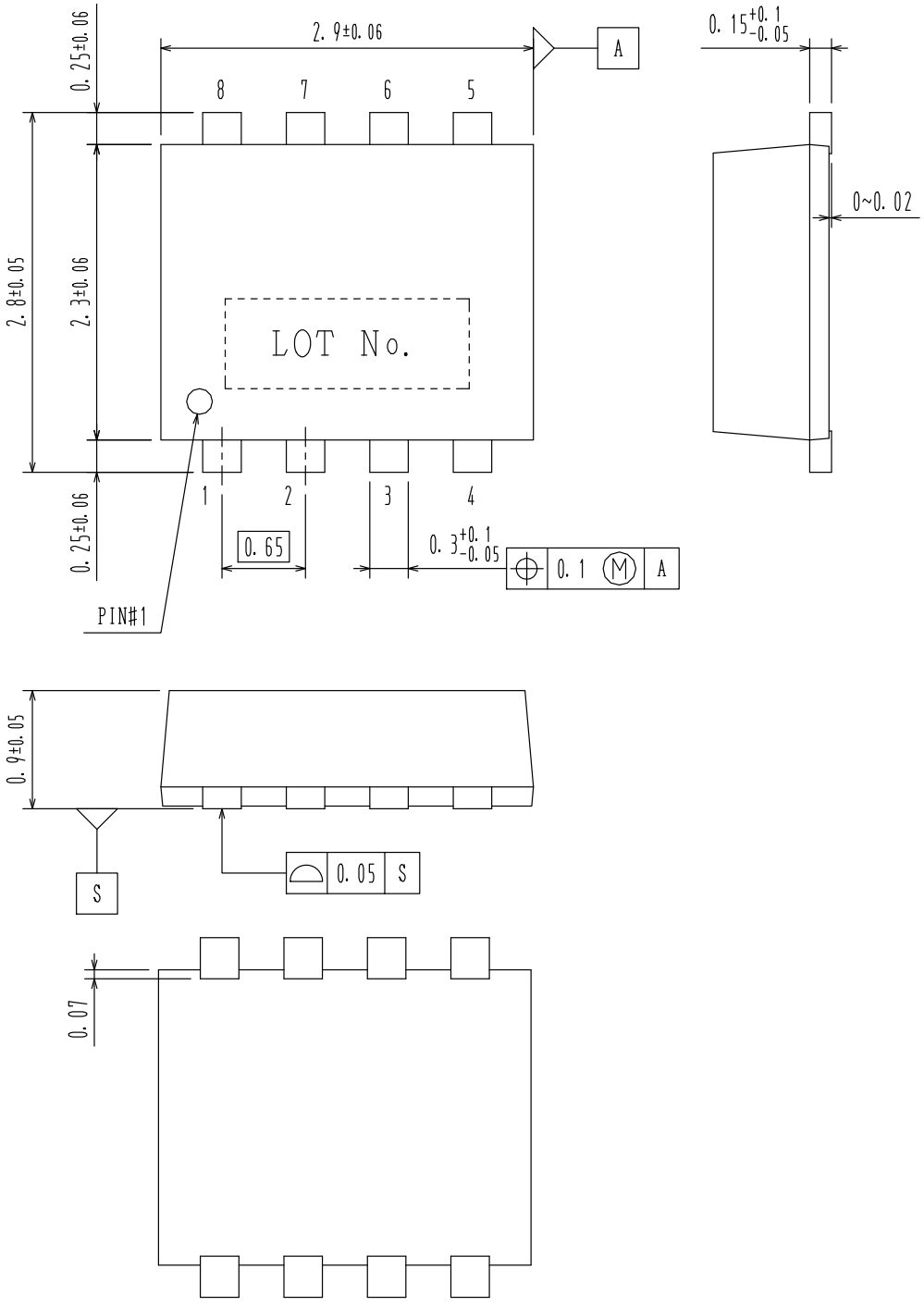


Figure 12. P_D − T_A

Since the ECH8655R−R−TL−H 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



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