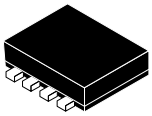
MOSFET – Power, N-Channel

20 V, 14 A, 6.8 mΩ, Single ECH8

ECH8420



SOT−28FL / ECH8
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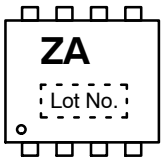
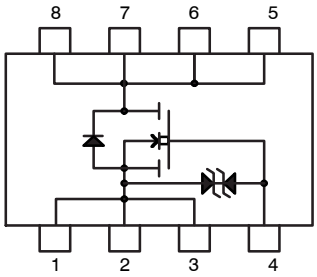
Features

- ON−resistance $R_{DS}(on)1$ = 5.2 mΩ (Typ.)
- 1.8 V Drive
- Protection Diode in
- This Device is Pb−Free and Halide Free

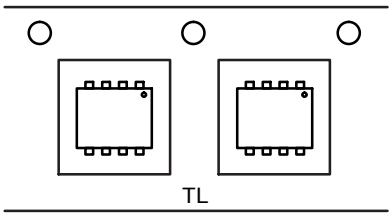
MARKING DIAGRAM



ELECTRICAL CONNECTION



PACKING TYPE: TL



Package Dimension

Unit : mm (typ)
7011A−002

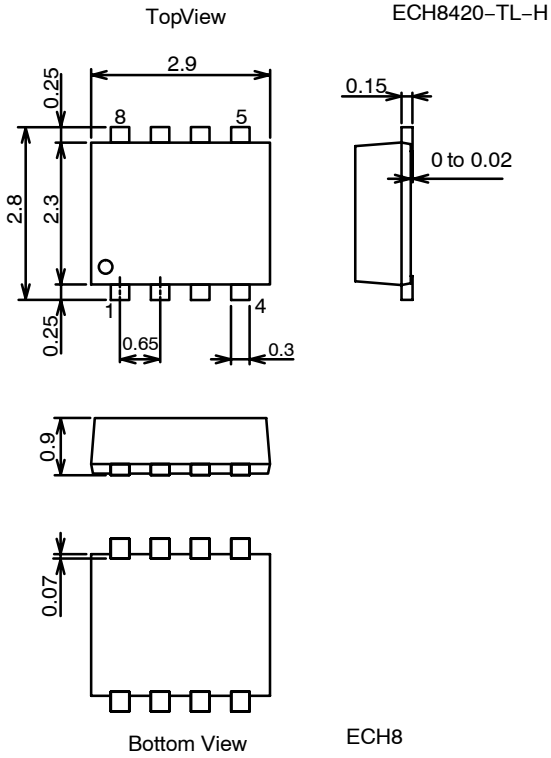


Figure 1. Package Dimensions

ORDERING INFORMATION

Device	Package	Shipping†
ECH8420−TL−H	SOT−28FL / ECH8 (Pb−Free, Halide Free)	3000 / Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, BRD8011/D.

Specifications

ABSOLUTE MAXIMUM RATINGS at T_A = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Drain−to−Source Voltage	V_{DSS}		20	V
Gate−to−Source Voltage	V_{GSS}		±12	V
Drain Current (DC)	I_D		14	A
Drain Current (Pulse)	I_{DP}	PW ≤ 10 μs, duty cycle ≤ 1%	50	A
Allowable Power Dissipation	P_D	When mounted on ceramic substrate (900 $mm^2 \times 0.8$ mm)	1.6	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	20	–	–	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	0.4	–	1.3	V
Forward Transfer Admittance	| yfs |	V_{DS} = 10 V, I_D = 7 A	–	14.5	–	S
Static Drain−to−Source On−State Resistance	R_{DS}(on)1	I_D = 7 A, V_{GS} = 4.5 V	–	5.2	6.8	mΩ
	R_{DS}(on)2	I_D = 4 A, V_{GS} = 2.5 V	–	8	11.5	mΩ
	R_{DS}(on)3	I_D = 2 A, V_{GS} = 1.8 V	–	15	22.5	mΩ
Input Capacitance	Ciss	V_{DS} = 10 V, f = 1 MHz	–	2430	–	pF
Output Capacitance	Coss		–	410	–	pF
Reverse Transfer Capacitance	Crss		–	330	–	pF
Turn−ON Delay Time	t_d(on)	See specified Test Circuit.	–	21	–	ns
Rise Time	t_r		–	88	–	ns
Turn−OFF Delay Time	t_d(off)		–	210	–	ns
Fall Time	t_f		–	115	–	ns
Total Gate Charge	Qg	V_{DS} = 10 V, V_{GS} = 4.5 V, I_D = 14 A	–	29	–	nC
Gate−to−Source Charge	Qgs		–	4.8	–	nC
Gate−to−Drain “Miller” Charge	Qgd		–	8.7	–	nC
Diode Forward Voltage	V_{SD}	I_S = 14 A, V_{GS} = 0 V	–	0.75	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

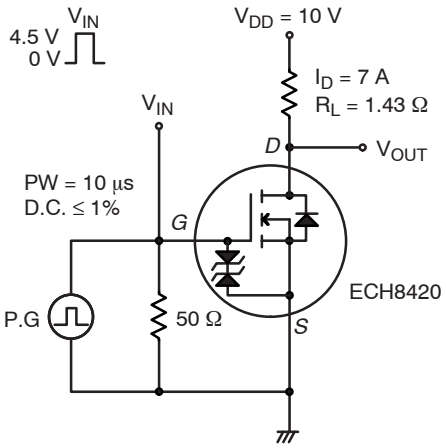


Figure 2. Switching Time Test Circuit

TYPICAL CHARACTERISTICS

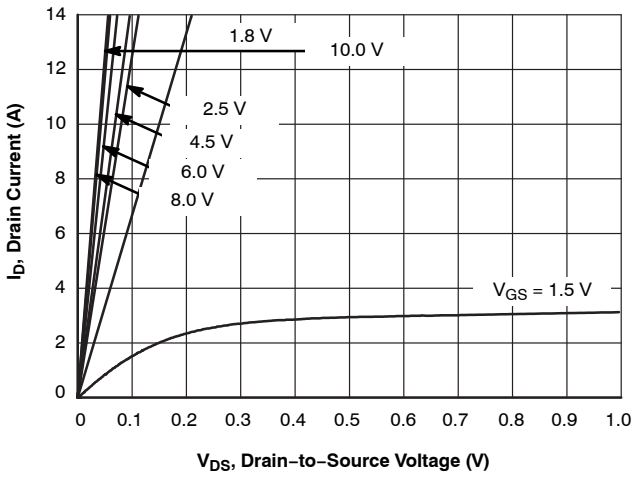


Figure 3. $I_D - V_{DS}$

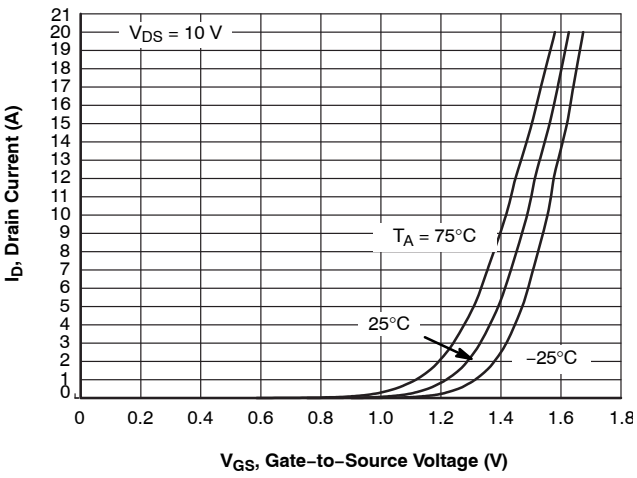


Figure 4. $I_D - V_{GS}$

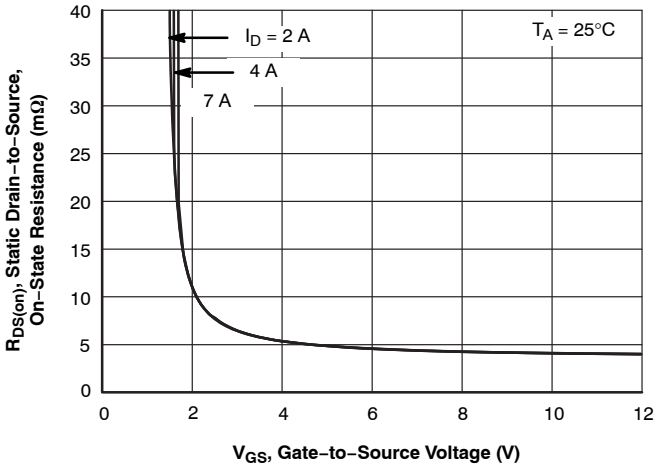


Figure 5. $R_{DS(on)} - V_{GS}$

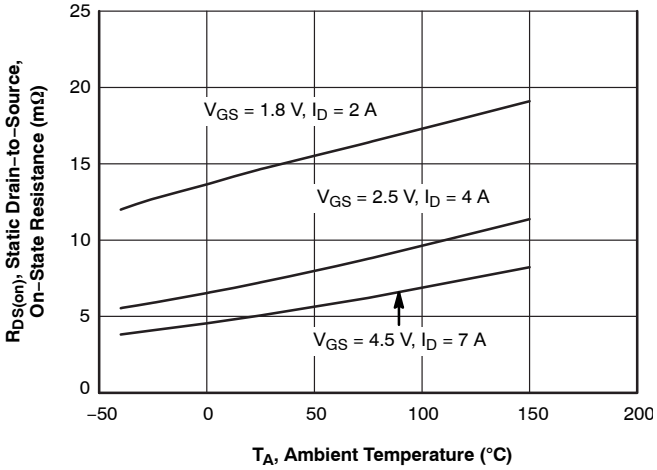


Figure 6. $R_{DS(on)} - T_A$

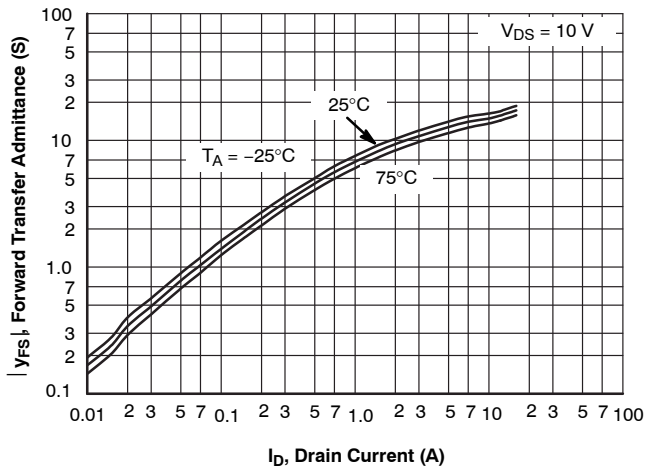


Figure 7. $|yfs| - I_D$

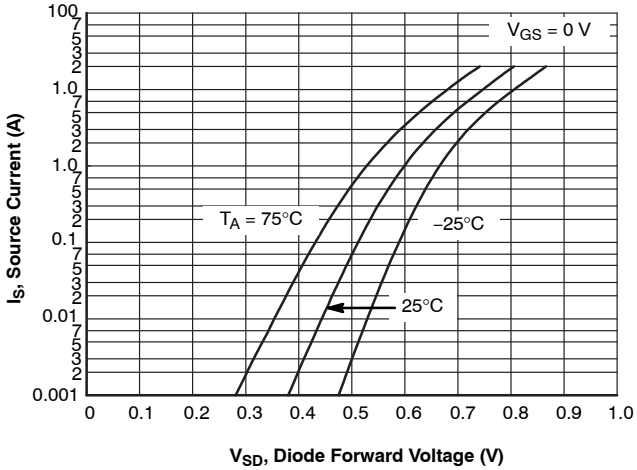


Figure 8. $I_S - V_{SD}$

TYPICAL CHARACTERISTICS (continued)

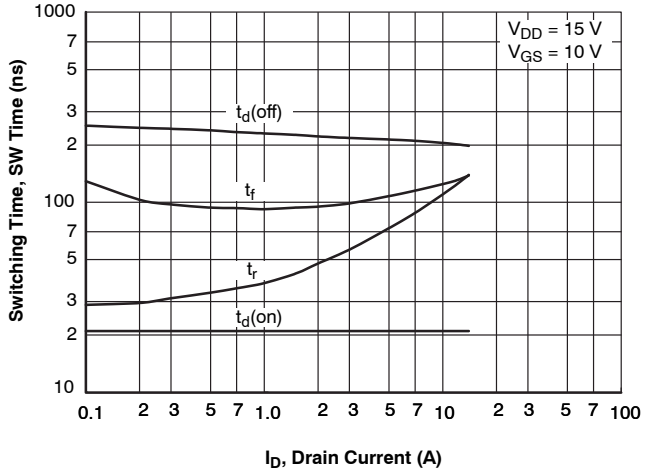


Figure 9. SW Time – I_D

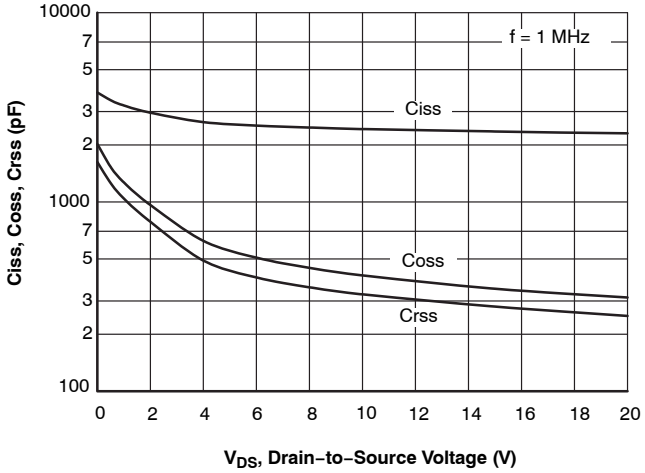


Figure 10. Ciss, Coss, Crss – V_{DS}

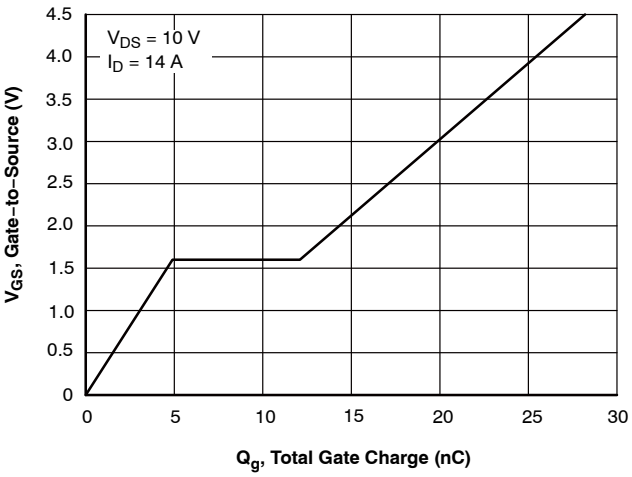


Figure 11. V_{GS} – Qg

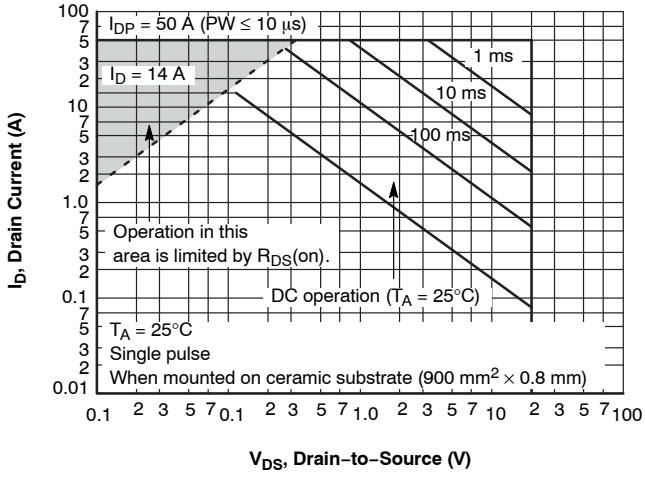


Figure 12. ASO

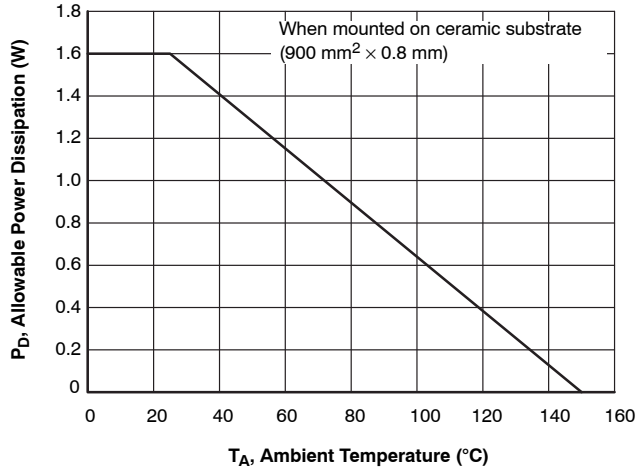


Figure 13. P_D – T_A

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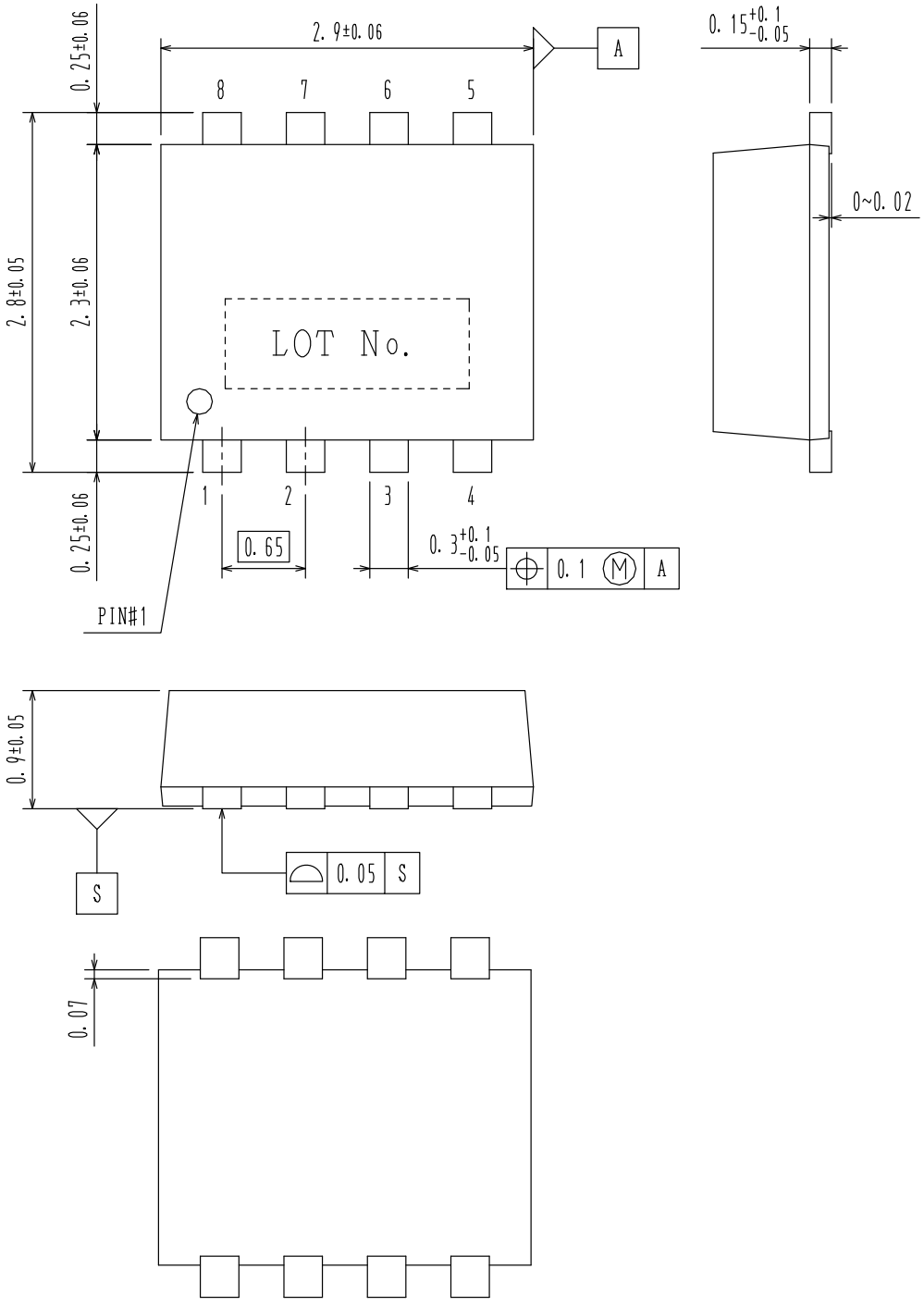
DATE 31 MAR 2012



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