

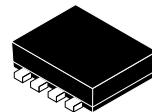
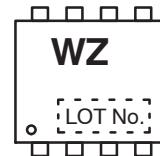
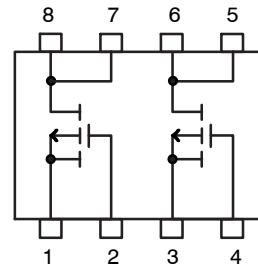
**MOSFET – Power, P-Channel,
Dual ECH8****-20 V, -5 A, 38 mΩ****ECH8654****Features**

- Low ON-resistance
- 1.8 V Drive
- Halogen Free Compliance
- Protection Diode in

ABSOLUTE MAXIMUM RATINGS (at $T_a = 25^\circ\text{C}$)

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		-20	V
Gate-to-Source Voltage	V_{GSS}		± 10	V
Drain Current (DC)	I_D		-5	A
Drain Current (Pulse)	I_{DP}	$PW \leq 10 \mu\text{s}$, duty cycle $\leq 1\%$	-40	A
Allowable Power Dissipation	P_D	When mounted on ceramic substrate ($900 \text{ mm}^2 \times 0.8 \text{ mm}$) 1 unit	1.3	W
Total Power Dissipation	P_T	When mounted on ceramic substrate ($900 \text{ mm}^2 \times 0.8 \text{ mm}$)	1.5	W
Channel Temperature	T_{ch}		150	$^\circ\text{C}$
Storage Temperature	T_{stg}		-55 to +150	$^\circ\text{C}$

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.

SOT-28FL / ECH8
CASE 318BF**MARKING DIAGRAM****ELECTRICAL CONNECTION**

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

ORDERING INFORMATION

Device	Package	Shipping [†]
ECH8654-TL-H	SOT-28FL / ECH8 (Pb-Free and 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 Specifications Brochure, [BRD8011/D](#).

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

Parameter	Symbol	Conditions	Ratings			Unit
			Min	Typ	Max	
Drain-to-Source Breakdown Voltage	$V_{(\text{BR})\text{DSS}}$	$I_D = -1 \text{ mA}, V_{GS} = 0 \text{ V}$	-20	-	-	V
Zero-Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -20 \text{ V}, V_{GS} = 0 \text{ V}$	-	-	-1	μA
Gate-to-Source Leakage Current	I_{GSS}	$V_{GS} = \pm 8 \text{ V}, V_{DS} = 0 \text{ V}$	-	-	± 10	μA
Cutoff Voltage	$V_{GS(\text{off})}$	$V_{DS} = -10 \text{ V}, I_D = -1 \text{ mA}$	-0.4	-	-1.3	V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS} = -10 \text{ V}, I_D = -3 \text{ A}$	4.9	8.3	-	S
Static Drain-to-Source On-State Resistance	$R_{DS(\text{on})1}$	$I_D = -3 \text{ A}, V_{GS} = -4.5 \text{ V}$	-	29	38	$\text{m}\Omega$
	$R_{DS(\text{on})2}$	$I_D = -1.5 \text{ A}, V_{GS} = -2.5 \text{ V}$	-	41	58	$\text{m}\Omega$
	$R_{DS(\text{on})3}$	$I_D = -0.5 \text{ A}, V_{GS} = -1.8 \text{ V}$	-	64	98	$\text{m}\Omega$
Input Capacitance	C_{iss}	$V_{DS} = -10 \text{ V}, f = 1 \text{ MHz}$	-	960	-	pF
Output Capacitance	C_{oss}		-	180	-	pF
Reverse Transfer Capacitance	C_{rss}		-	140	-	pF
Turn-ON Delay Time	$t_{\text{d(on)}}$	See specified Test Circuit.	-	14	-	ns
Rise Time	t_r		-	55	-	ns
Turn-OFF Delay Time	$t_{\text{d(off)}}$		-	92	-	ns
Fall Time	t_f		-	68	-	ns
Total Gate Charge	Q_g	$V_{DS} = -10 \text{ V}, V_{GS} = -4.5 \text{ V}, I_D = -5 \text{ A}$	-	11	-	nC
Gate-to-Source Charge	Q_{gs}		-	2.0	-	nC
Gate-to-Drain "Miller" Charge	Q_{gd}		-	2.8	-	nC
Diode Forward Voltage	V_{SD}	$I_S = -5 \text{ A}, V_{GS} = 0 \text{ V}$	-	-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.

Switching Time Test Circuit

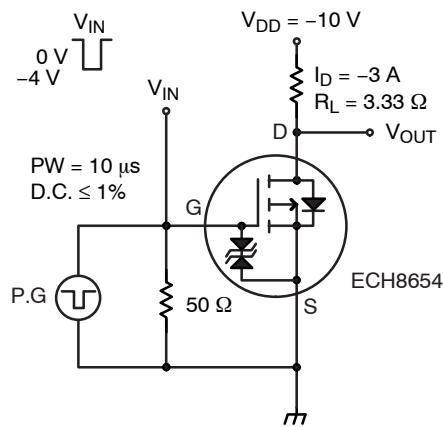


Figure 1. Switching Time Test Circuit

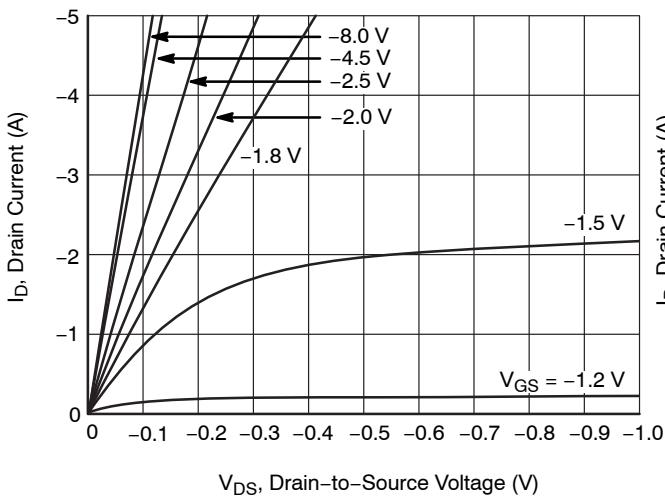


Figure 2. I_D – V_{DS}

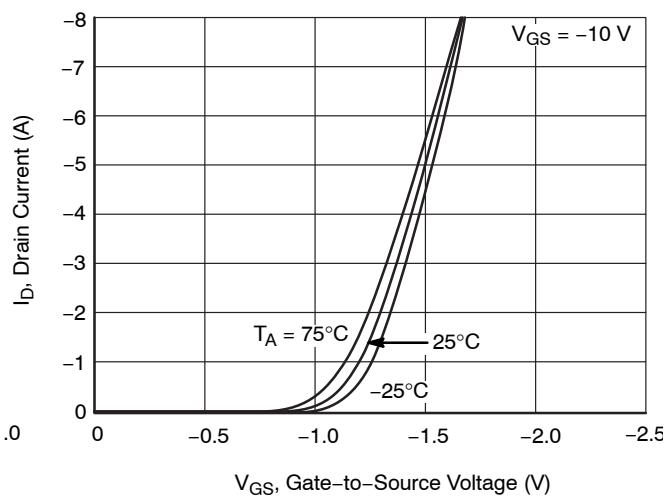


Figure 3. I_D – V_{GS}

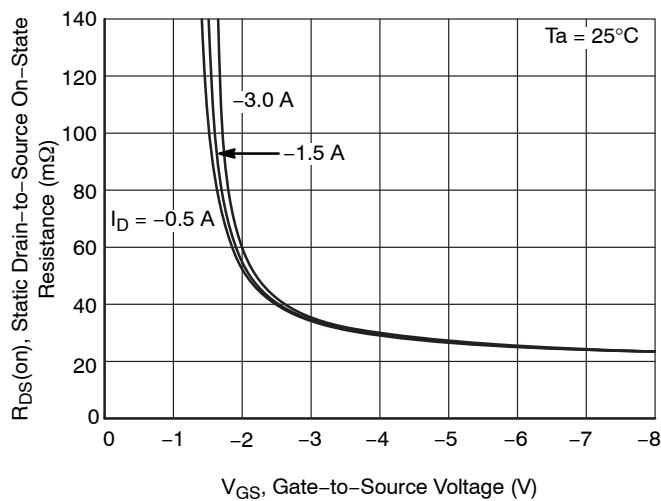


Figure 4. $R_{DS(on)}$ – V_{GS}

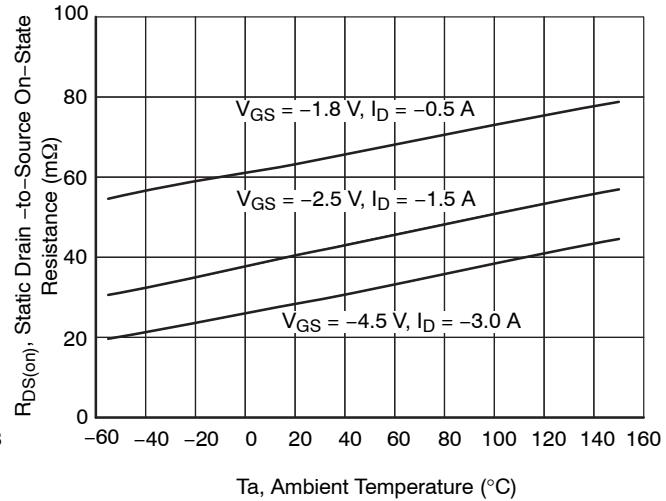


Figure 5. $R_{DS(on)}$ – T_a

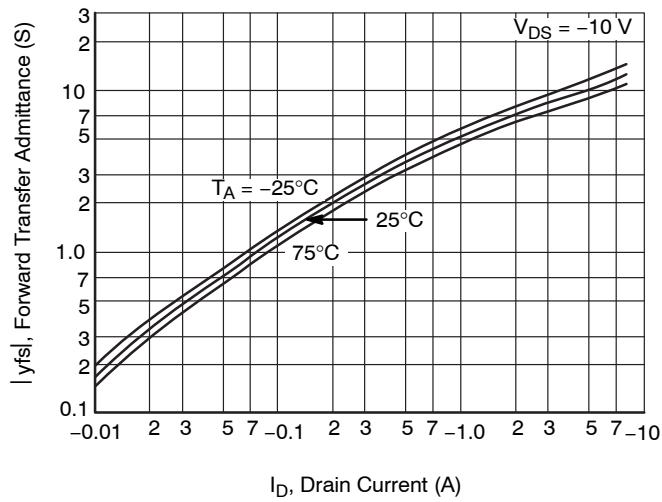


Figure 6. $|y_{fs}|$ – I_D

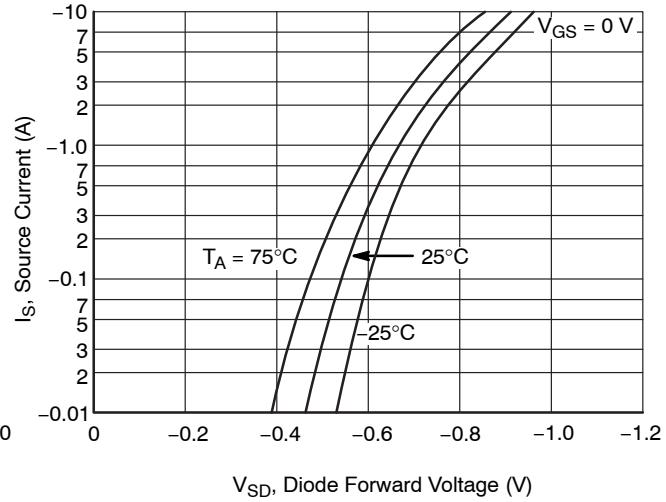


Figure 7. I_S – V_{SD}

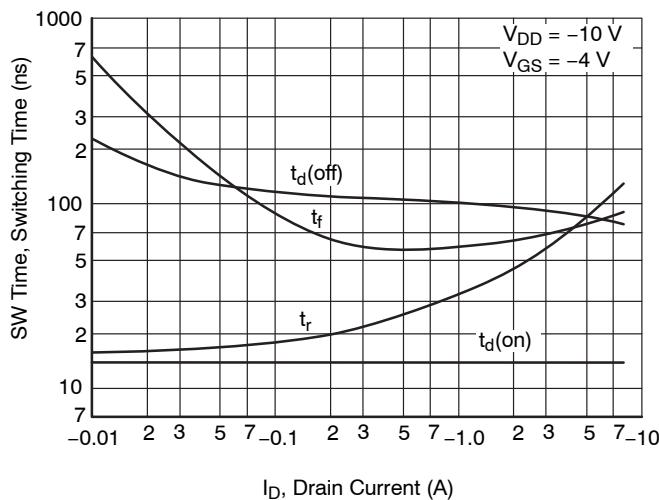


Figure 8. SW Time – I_D

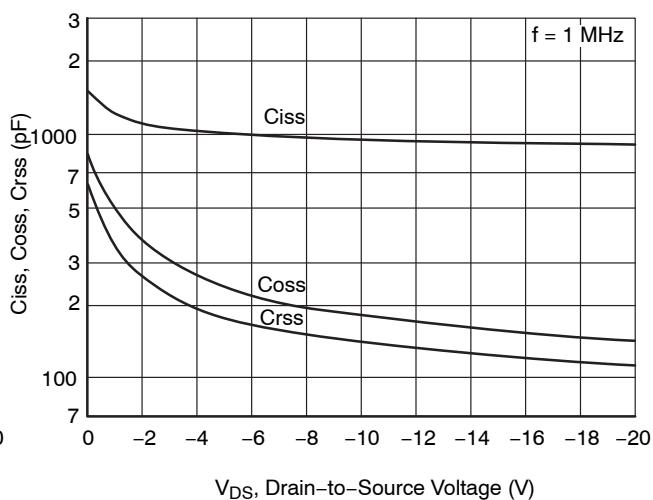


Figure 9. C_{iss} , C_{oss} , C_{rss} – V_{DS}

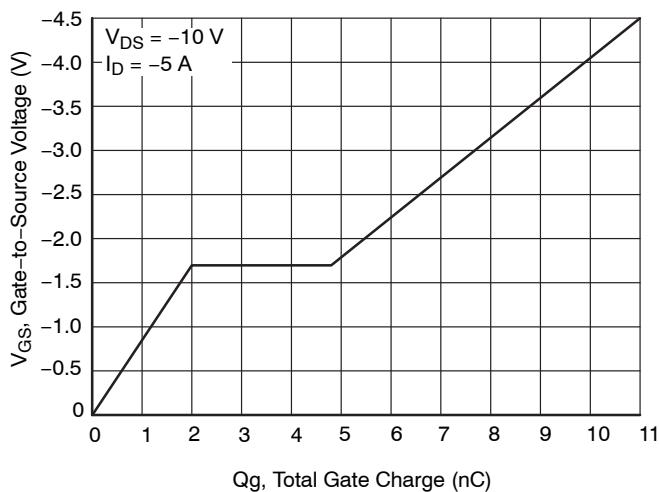


Figure 10. V_{GS} – Q_g

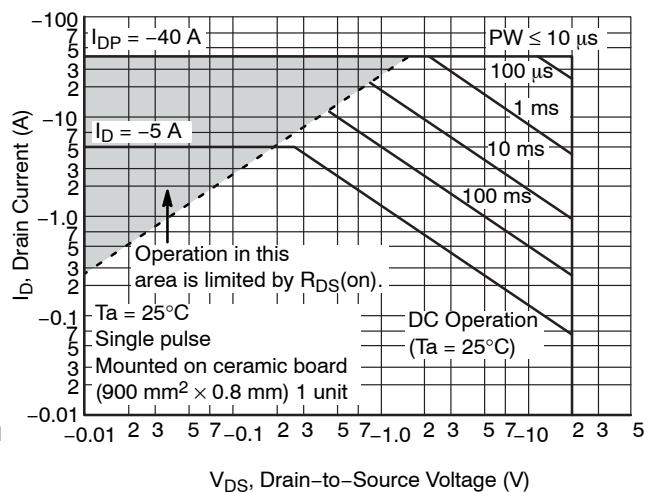


Figure 11. ASO

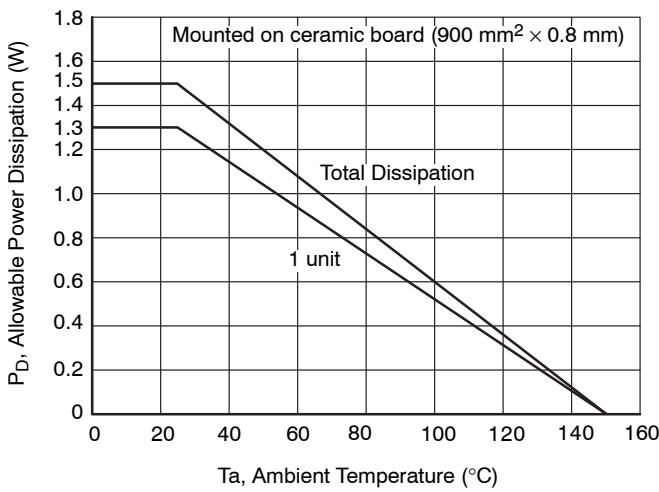
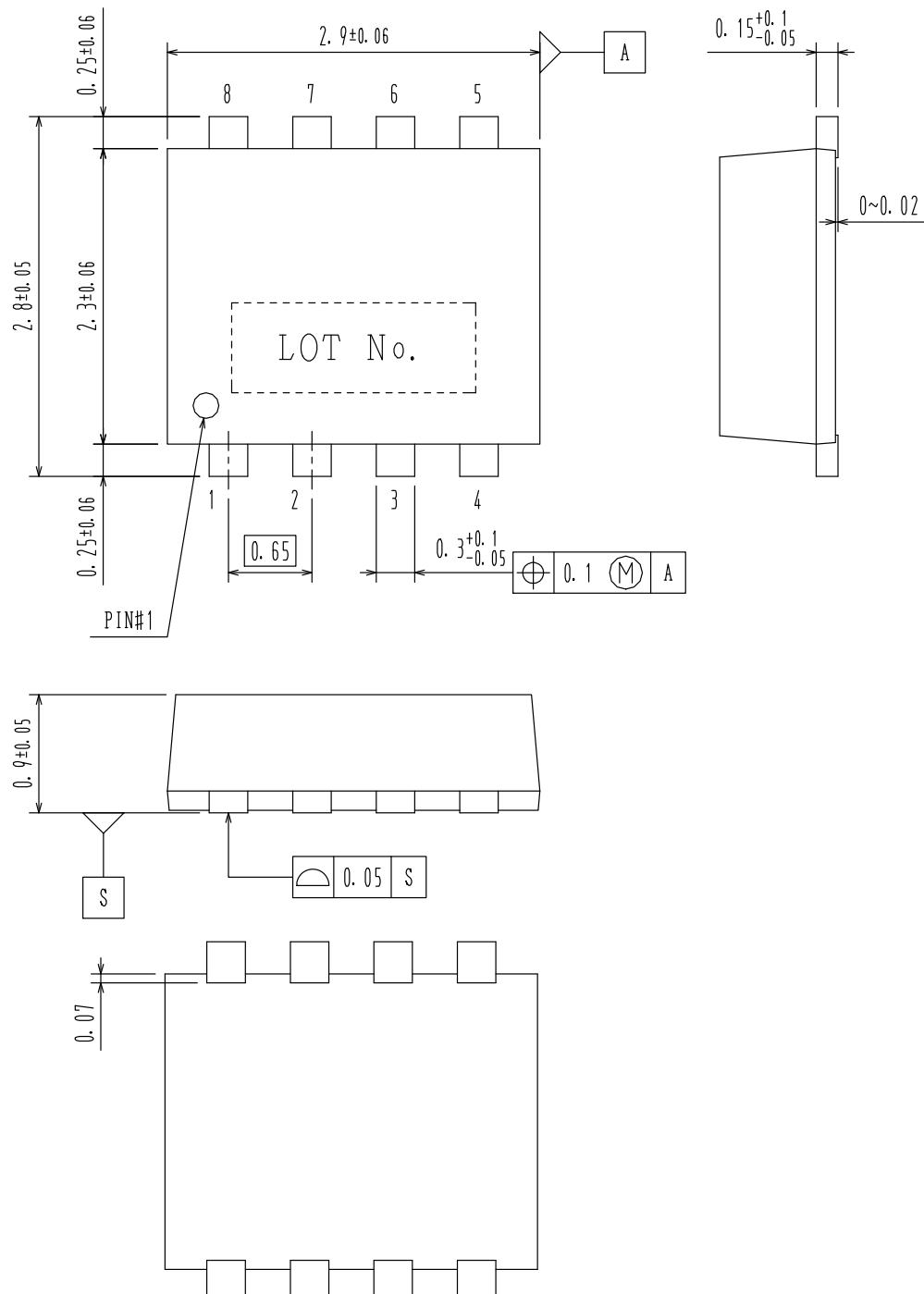


Figure 12. P_D – T_a

SOT-28FL / ECH8
CASE 318BF
ISSUE O

DATE 31 MAR 2012



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