FH8809A

N- Channel Enhancement Mode Power MOSFET

Description

TThe FH8809A is the highest performance trench N-Ch MOSFETs with extreme high cell density,which provide excellent RDSON and gate charge for most of the small power switching and load switch applications.

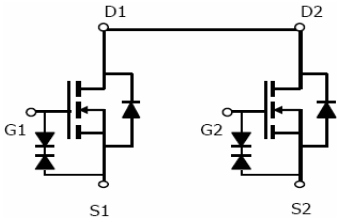
Application

- PWM application
- Load switch

General Features

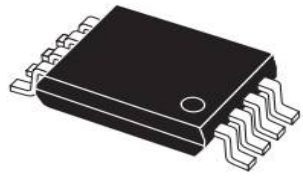
VDSS	ID	RDS(ON) (mΩ) Typ
20V	9.0A	8.5 @ VGS=4.5V
		8.8 @ VGS=3.7V
		9.5 @ VGS=3.1V
		10 @ VGS=2.5V

- Super high dense cell design for low RDS(ON)
- Rugged and reliable
- Surface mount package
- ESD Rating: 2000V HBM



Schematic diagram

Marking and pin Assignment



TSSOP-8 Pin assignment and Top View

Absolute Maximum Ratings (T_A=25℃ unless otherwise noted)

Symbol	Parameter		Limit	Units
V_{DS}	Drain-Source Voltage		20	V
V_{GS}	Gate-Source Voltage		±12	V
I_D	Drain Current-Continuous [c]	T_A=25°C	9.0	A
		T_A=70°C	7.2	A
I_{DM}	-Pulsed [a c]		36	A
P_D	Maximum Power Dissipation	T_A=25°C	1.50	W
		T_A=70°C	0.92	W
T_J T_{STG}	Operating Junction and Storage Temperature Range		-55 to 150	°C

THERMAL CHARACTERISTICS

$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	85	°C/W

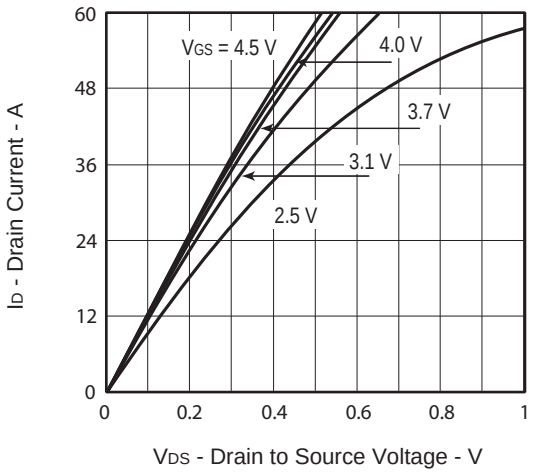
Symbol	Parameter	Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	20			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=20V , V_{GS}=0V			1	uA
I_{GSS}	Gate-Body Leakage Current	V_{GS}= ±12V , V_{DS}=0V			±10	uA
ON CHARACTERISTICS						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS} , I_D=250uA	0.45	0.7	1.0	V
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS}=4.5V , I_D=6.0A	5	8.5	10	mΩ
		V_{GS}=3.7V , I_D=5.0A	5.5	8.8	10.5	mΩ
		V_{GS}=3.1V , I_D=5.0A	6.5	9.5	11	mΩ
		V_{GS}=2.5V , I_D=4.0A	7.5	10	12	mΩ
g_{FS}	Forward Transconductance	V_{DS}=5V , I_D=6.5A		28		S
DYNAMIC CHARACTERISTICS [b]						
C_{ISS}	Input Capacitance	V_{DS}=10V,V_{GS}=0V f=1.0MHz		1162		pF
C_{OSS}	Output Capacitance			213		pF
C_{RSS}	Reverse Transfer Capacitance			189		pF
SWITCHING CHARACTERISTICS [b]						
$t_{D(ON)}$	Turn-On Delay Time	V_{DD}=16V I_D=4.75A V_{GS}=4.5V R_{GEN}= 6 ohm		24		ns
tr	Rise Time			36		ns
$t_{D(OFF)}$	Turn-Off Delay Time			76		ns
tf	Fall Time			46		ns
Q_g	Total Gate Charge	V_{DS}=16V,I_D=6.5A, V_{GS}=4.5V		13		nC
Q_{gs}	Gate-Source Charge			2.1		nC
Q_{gd}	Gate-Drain Charge			5.4		nC
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
V_{SD}	Diode Forward Voltage	V_{GS}=0V,I_S=6.5A		0.75	1.2	V

Notes

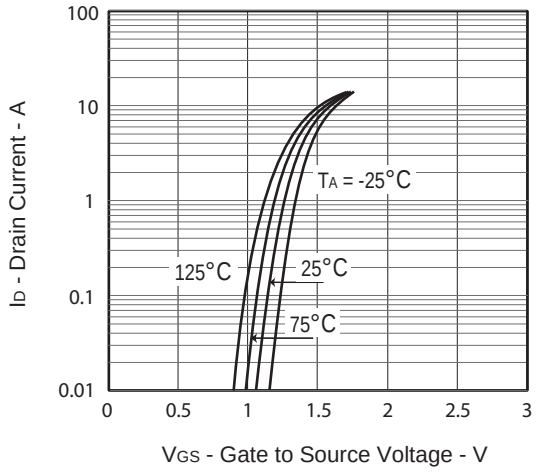
a.Pulse Test:Pulse Width ≤ 10us, Duty Cycle ≤ 1%.
b.Guaranteed by design, not subject to production testing.
c.Drain current limited by maximum junction temperature.
d.Mounted on FR4 Board of 1 inch^2 , 2oz.

Typical Electrical and Thermal Characteristics

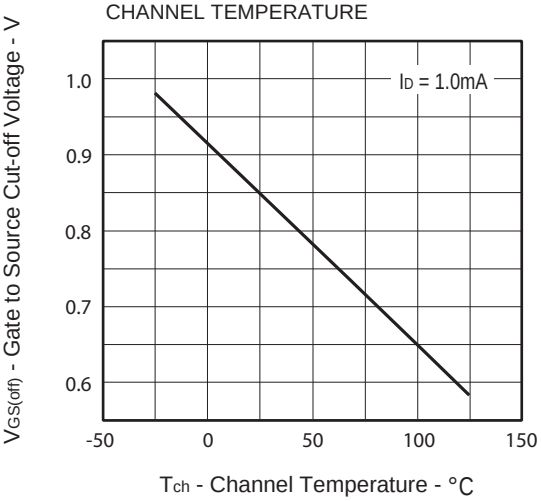
DRAIN CURRENT vs.
DRAIN TO SOURCE VOLTAGE



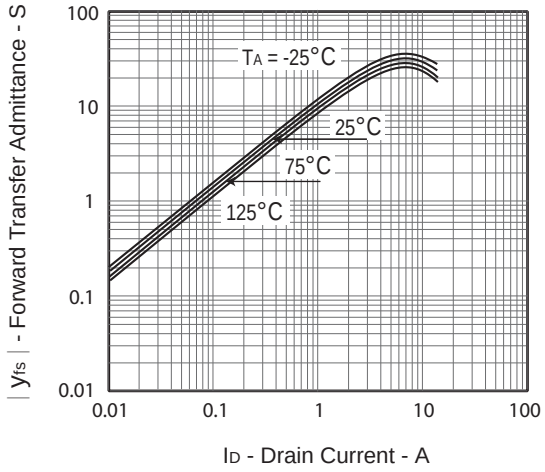
FORWARD TRANSFER CHARACTERISTICS



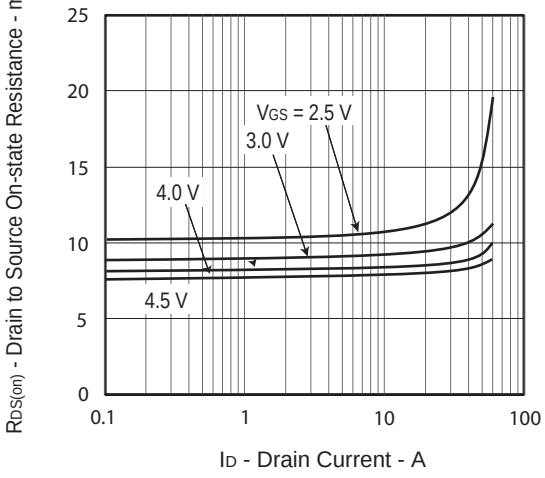
GATEBTO SOURE CUT-OFF VOLTAGE vs.
CHANNEL TEMPERATURE



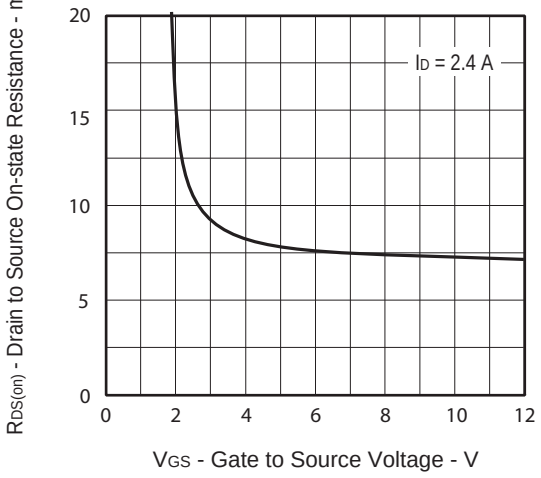
FORWARD TRANSFER ADMITTANCE vs.
DRAIN CURRENT



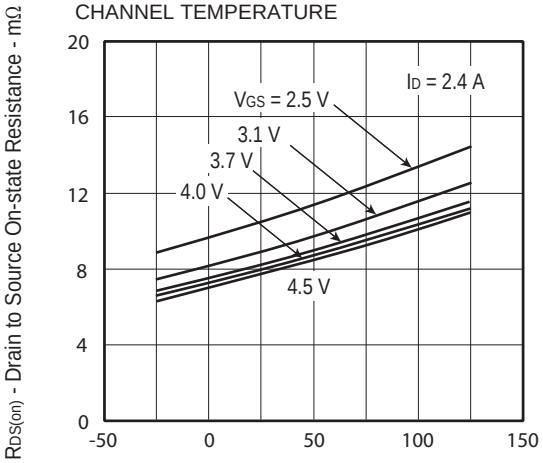
DRAIN TO SOURCE ON-STATE RESISTANCE vs.
DRAIN CURRENT



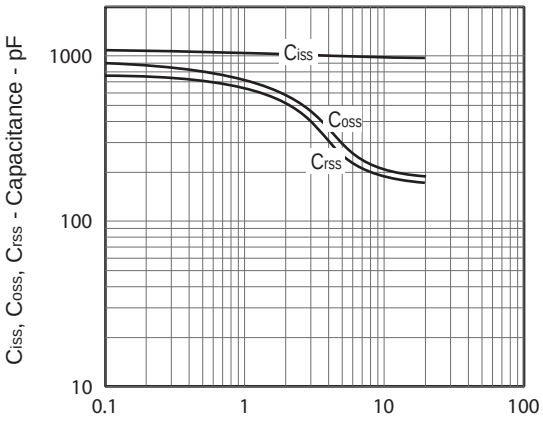
DRAIN TO SOURCE ON-STATE RESISTANCE vs.
GATE TO SOURCE VOLTAGE



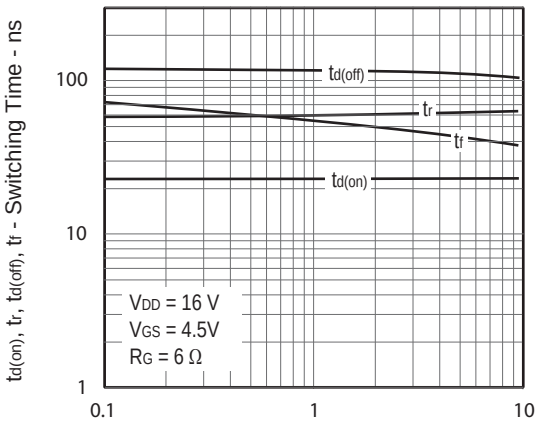
DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE



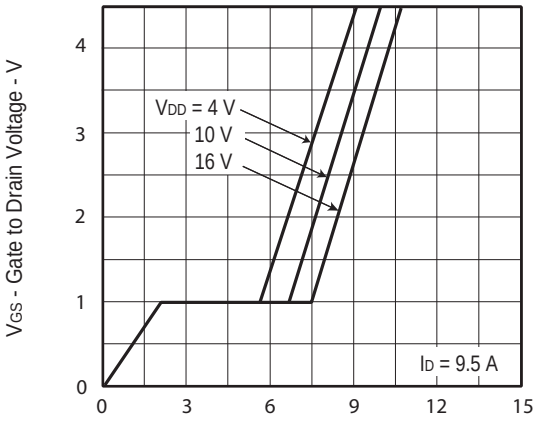
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



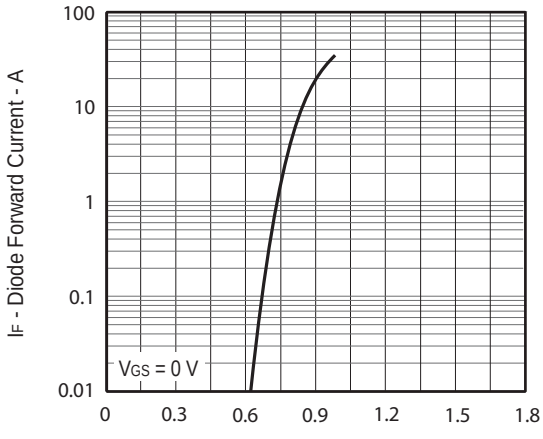
SWITCHING CHARACTERISTICS



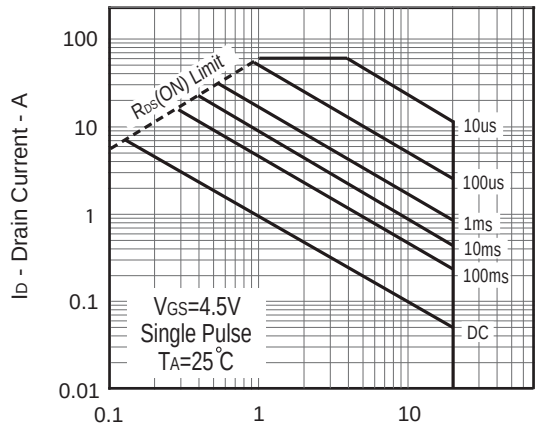
DYNAMIC INPUT CHARACTERISTICS



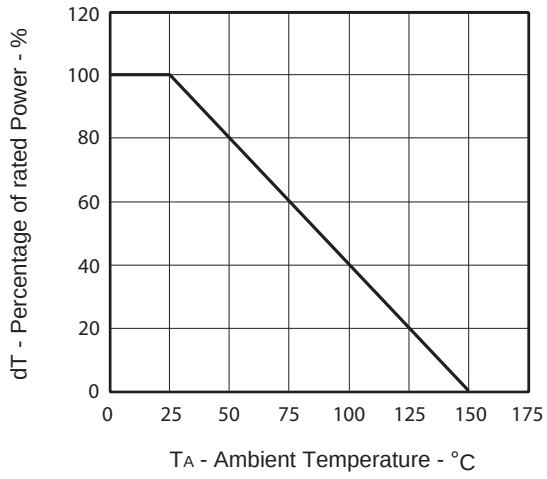
SOURCE TO DRAIN DIODE FORWARD VOLTAGE



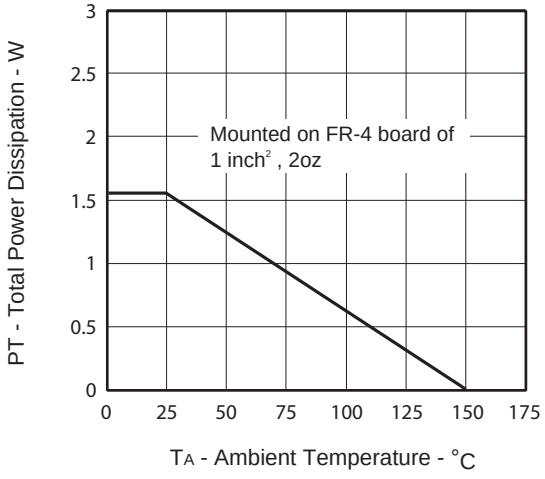
FORWARD BIAS SAFE OPERATING AREA



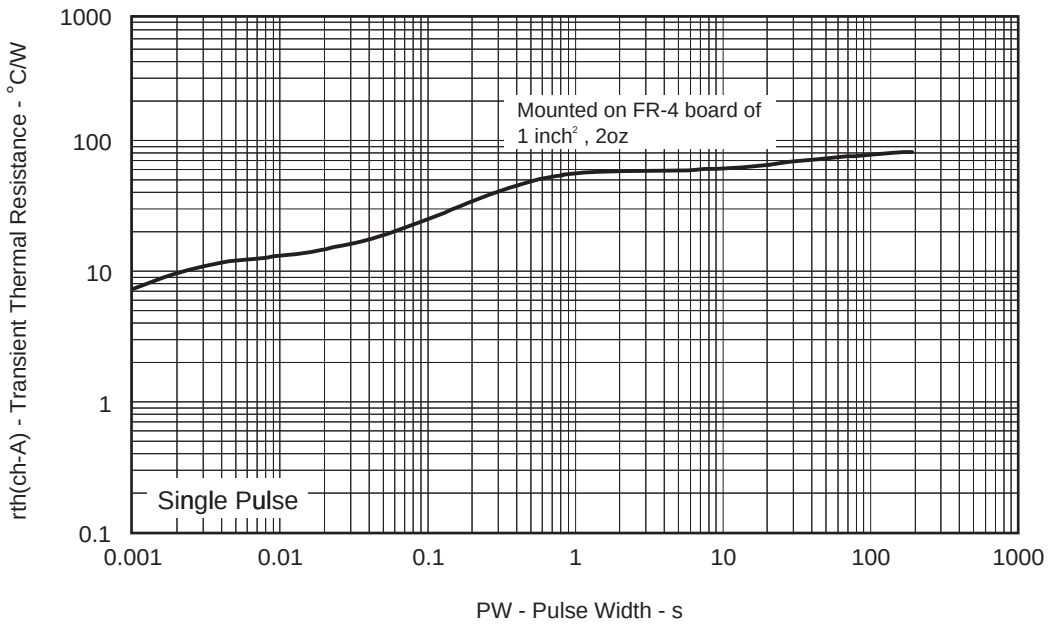
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



TRANSIENT THERMAL RESISTANCE vs. PULSE WIDTH

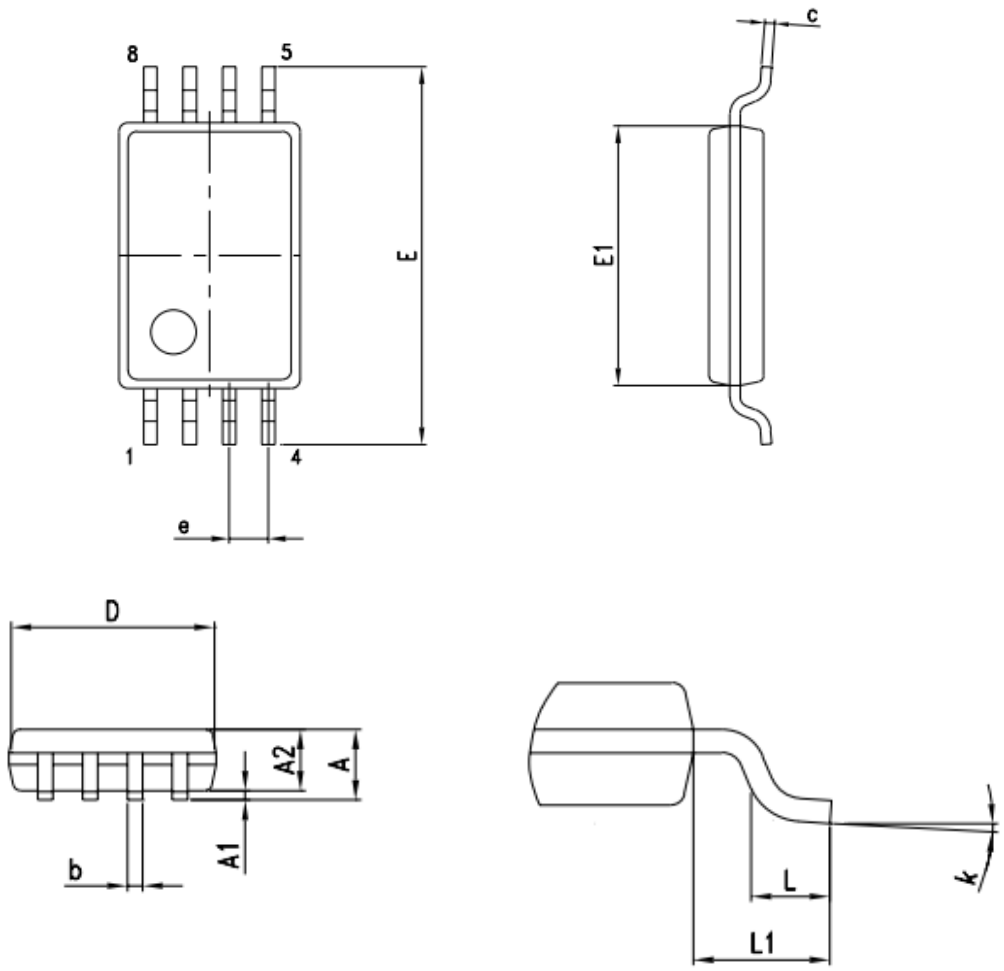


MARKING DESCRIPSION TSSOP-8

NOTE：

AAAA : Internal Code
BB : Year Code
CC : Week Code
DD : Serial Code

Package Outline Dimensions : TSSOP-8



DIM.	mm.			inch.		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	1.05		1.20	0.041		0.047
A1	0.05		0.15	0.002		0.006
A2	0.80		1.05	0.032		0.041
b	0.19		0.30	0.008		0.012
c	0.090		0.20	0.003		0.007
D	2.90		3.10	0.114		0.122
E	6.20		6.60	0.240		0.260
E1	4.30		4.50	0.170		0.177
e		0.65			0.025	
L	0.45		0.75	0.018		0.030
L1		1.00			0.039	
k	0°		8°	0.192		0.208