

40V N Channel Enhancement MOSFET

Description

The FTK4448A is the new generation trench N-ch MOSFET has been designed to minimize the on-state resistance ($R_{DS(ON)}$) yet maintain superior switching performance, making it ideal for high efficiency power management applications

V_{DSS}	40V
I_D	13A
$R_{DS(ON)}$	10mΩ@ $V_{GS}=10V$
$R_{DS(ON)}$	14mΩ@ $V_{GS}=4.5V$

Features

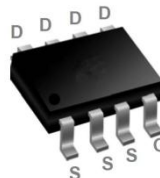
- High - speed switching
- Excellent gate charge x $R_{ds(ON)}$ product (FOM)
- for extremely low $R_{DS(ON)}$
- Lead-Free, Halogen-Free; RoHS Compliant

Applications

- POL Applications
- Load Switch
- Power Management
- LED Application

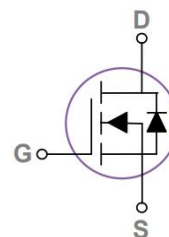
Outline

SOP-8 Pin Configuration



Equivalent

- (1\2\3)Source
- (4)Gate
- (5\6\7\8)Drain



Packaging specifications

Part No.	Package	Marking	Basic ordering unit.(pcs)
FTK4448A	SOP-8	RM4448A	3000

Absolute Maximum Ratings

Parameter		Symbol	Limit	Units
Drain-Source Voltage		V_{DS}	40	V
Gate-Source Voltage		V_{GS}	±20	V
Drain Current-Continuous ^(Note2)	$T_C=25^{\circ}C$	I_D	13	A
	$T_C=70^{\circ}C$		10.4	A
-Pulsed ^(Note 1· Note 2)		I_{DM}	52	A
Maximum Power Dissipation	$T_C=25^{\circ}C$	P_D	2	W
	$T_C=70^{\circ}C$		1.6	W
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	°C
Thermal Resistance Junction-Ambient		$R_{\theta JA}$	60	°C /W

**Electrical Characteristics** ($T_C=25\text{ }^{\circ}\text{C}$, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V , I _D = 250uA	40			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =40V , V _{GS} =0V			1	uA
Gate-Body Leakage Current	I _{GSS}	V _{GS} = ±20V , V _{DS} =0V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D =250uA	1	1.7	2.5	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V , I _D =5A		10	13	mΩ
		V _{GS} =4.5V , I _D =3A		14	20	mΩ
Forward Transconductance	g _{FS}	V _g s =10V , I _D =1A		6		S
DYNAMIC CHARACTERISTICS Note4						
Input Capacitance	C _{ISS}	V _{DS} =20V , V _{GS} =0 V , f =1.0MHz		1100		pF
Output Capacitance	C _{OSS}			110		pF
Reverse Transfer Capacitance	C _{RSS}			80		pF
Total Gate Charge	Q _g	V _{DS} =20V , I _D =3A , V _{GS} =10V		13		nC
Gate-Source Charge	Q _{gs}	V _{DS} =20V , I _D =3A , V _{GS} =10V		4		nC
Gate-Drain Charge	Q _{gd}			5.3		nC
SWITCHING CHARACTERISTICS Note4						
Turn-On Delay Time	t _{D(ON)}	V _{DD} =20V , I _D =1A , V _{GS} =10V , R _G =6Ω		8		ns
Rise Time	tr			3.2		ns
Turn-Off Delay Time	t _{D(OFF)}			26.5		ns
Fall Time	tf			3.8		ns
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Diode Forward Voltage	V _{SD}	V _{GS} =0V , I _S =1A			1.0	V

Notes:

- 1、Pulse Test Width < 300us,Duty Cycle< 2%
- 2、Drain current limited by maximum junction temperature.
- 3、Starting $T_j=25^{\circ}\text{C}$, $L=0.1mH$, $V_{DD}=25V$, $V_{GS}=10V$, $R_G=25\Omega$
- 4、Guaranteed by design,not subject to production testing.

Typical Performance Characteristics

Fig.1 Continuous Drain Current vs. T_C

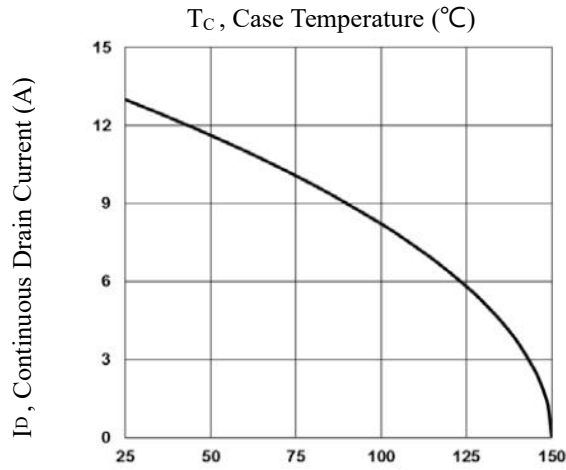


Fig.2 Normalized $R_{DS(on)}$ vs. T_J

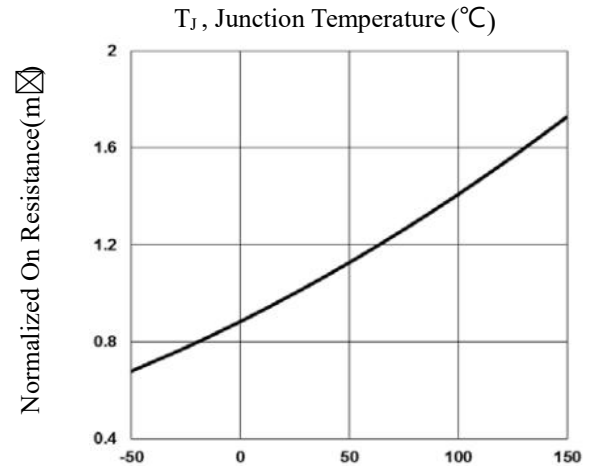


Fig.3 Normalized V_{th} vs. T_J

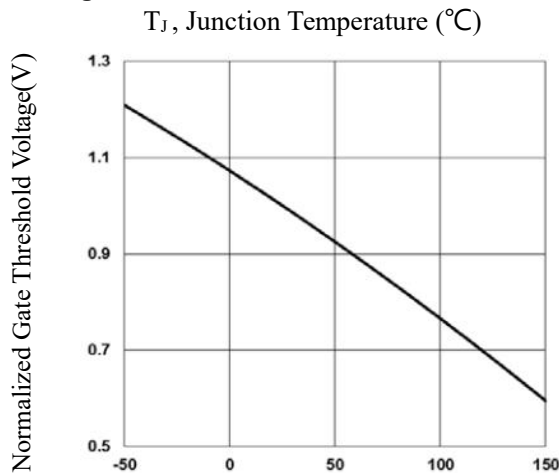


Fig.4 Gate Charge Waveform

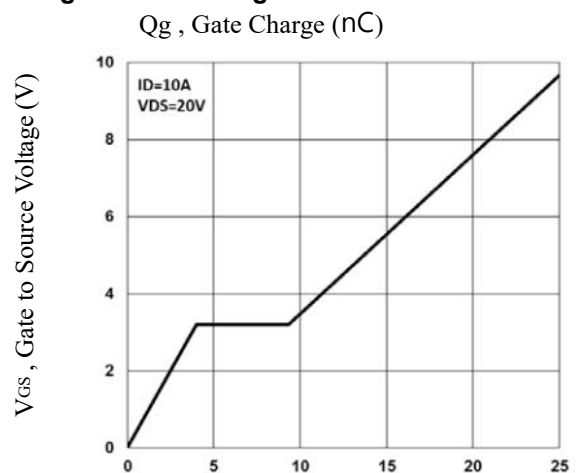


Fig.5 Normalized Transient Impedance

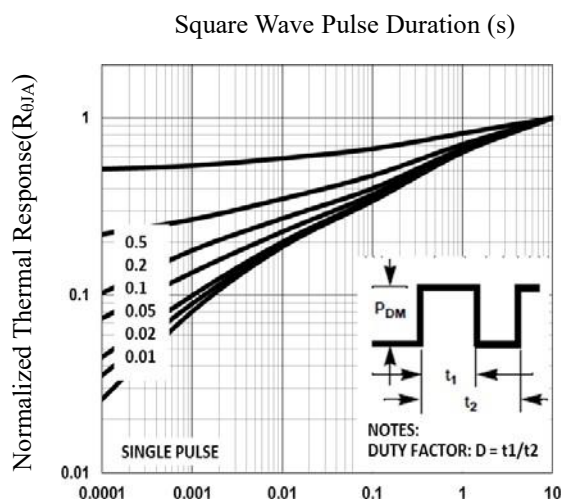


Fig.6 Maximum Safe Operation Area

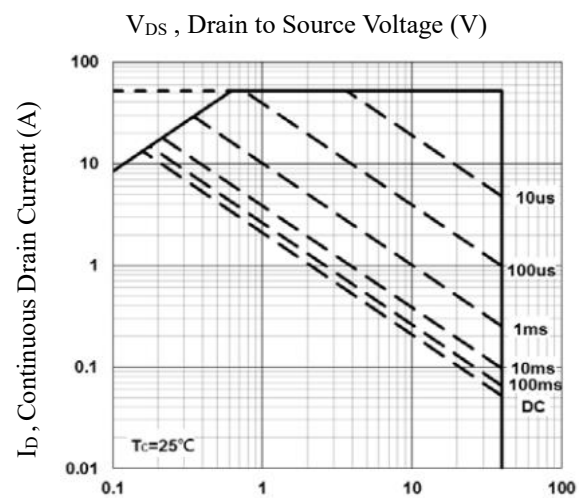


Figure 7a. Switching Test Circuit

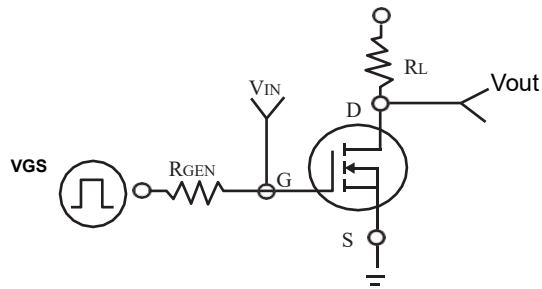


Figure 7b. Switching Waveforms

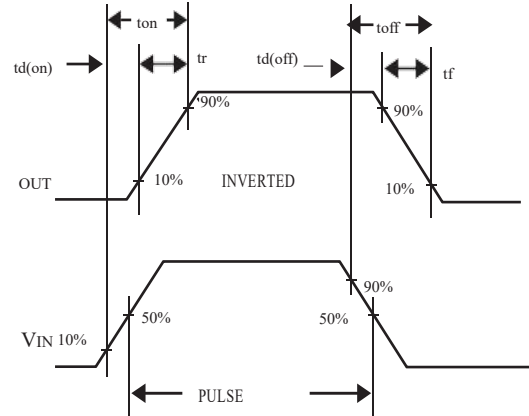


Figure 8a. Unclamped Inductive Test Circuit

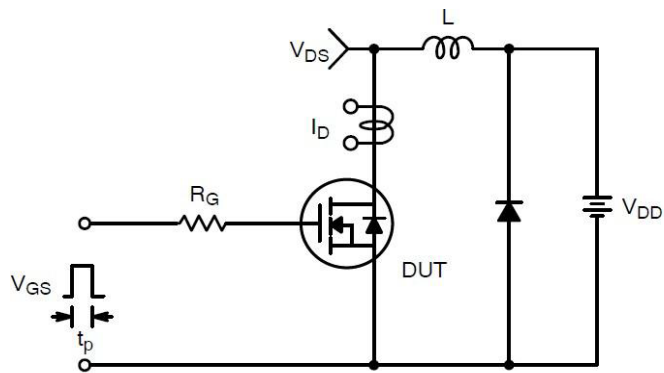
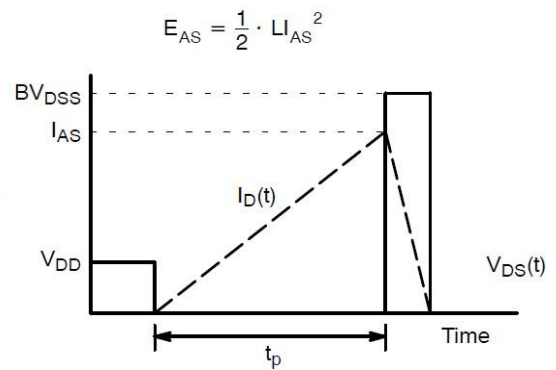
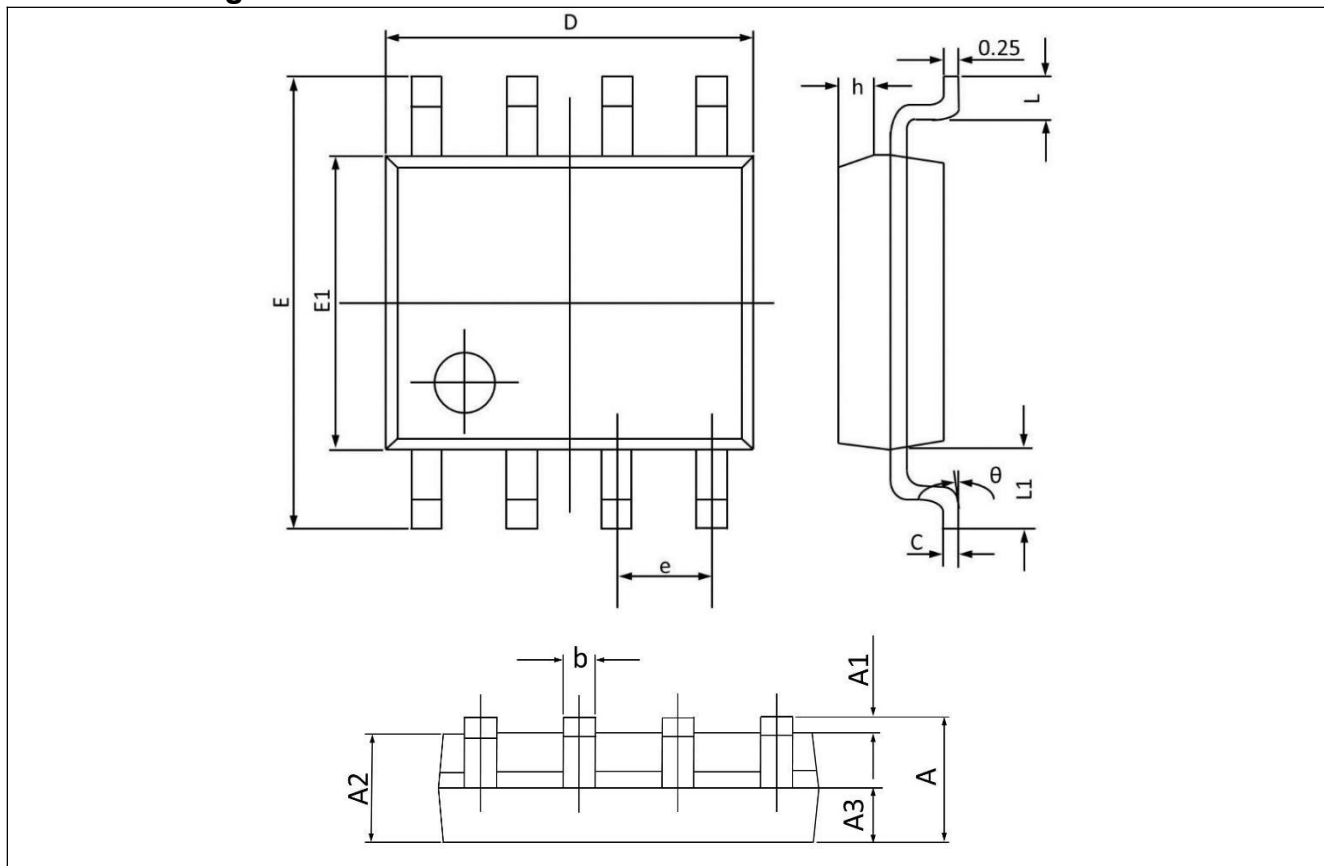


Figure 8b. Unclamped Inductive Waveforms



SOP- 8 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.800	0.053	0.069
A1	0.050	0.250	0.002	0.010
A2	1.250	1.650	0.049	0.065
A3	0.500	0.700	0.020	0.028
b	0.300	0.510	0.012	0.020
c	0.150	0.260	0.006	0.010
D	4.700	5.100	0.185	0.201
E	5.800	6.200	0.228	0.244
E1	3.700	4.100	0.146	0.161
e	1.270(BSC)		0.050(BSC)	
h	0.250	0.500	0.010	0.020
L	0.400	1.000	0.016	0.039
L1	1.050(BSC)		0.041(BSC)	
θ	0°	8°	0°	8°