

N-Channel Enhancement Mode Power MOSFET

Description

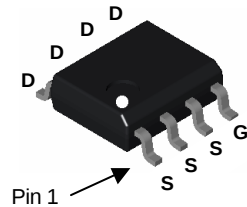
The K4410 uses advanced trench technology to provide excellent $R_{DS(on)}$ and low gate charge. The complementary MOSFETs may be used to form a level shifted high side switch, and for a host of other applications.

General Features

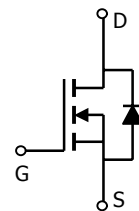
PRODUCT SUMMARY		
V_{DS}	I_D	$R_{DS(on)}$ (m Ω) Max
30V	10 A	13.5 @ $V_{GS} = 10V$
	5 A	18.0 @ $V_{GS} = 4.5V$

- High power and current handling capability
- Lead free product is acquired
- Surface mount package

SOP-8L



Equivalent Circuit



MARKING



Y :year code W :week code

Absolute Maximum Ratings T _A =25°C unless otherwise noted				
Parameter		Symbol	Maximum	Units
Drain-Source Voltage		V _{DS}	30	V
Gate-Source Voltage		V _{GS}	±20	V
Continuous Drain Current ^A	T _A =25°C	I _D	10	A
Pulsed Drain Current ^B		I _{DM}	45	
Power Dissipation ^A	T _A =25°C	P _D	2.3	W
	T _A =70°C		1.6	
Junction and Storage Temperature Range		T _J , T _{STG}	-55 to 150	°C

Thermal Characteristics					
Parameter		Symbol	Typ	Max	Units
Maximum Junction-to-Ambient ^A	$t \leq 10s$	$R_{\theta JA}$	48	62.5	$^\circ\text{C/W}$
Maximum Junction-to-Ambient ^A	Steady-State		74	110	$^\circ\text{C/W}$
Maximum Junction-to-Lead ^C	Steady-State	$R_{\theta JL}$	35	40	$^\circ\text{C/W}$

Electrical Characteristics (T_j=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
STATIC PARAMETERS						
BV _{DSS}	Drain-Source Breakdown Voltage	I _D = 250μA, V _{GS} = 0V	30			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 24V, V _{GS} = 0V			500	nA
I _{GSS}	Gate-Body leakage current	V _{DS} = 0V, V _{GS} = ±20V			±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250μA	1.0	1.6	2.5	V
I _{D(ON)}	On state drain current	V _{GS} = 10V, V _{DS} = 5V			45	A
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} = 10V, I _D = 10A		11	13.5	mΩ
		V _{GS} = 4.5V, I _D = 5A		16	18.0	mΩ
g _{FS}	Forward Transconductance	V _{DS} = 15V, I _D = 10A		9		S
V _{SD}	Diode Forward Voltage	I _S = 3A, V _{GS} = 0V		0.8	1.2	V
I _S	Maximum Body-Diode Continuous Current				3	A

DYNAMIC PARAMETERS

C _{iss}	Input Capacitance	V _{GS} = 0V, V _{DS} = 25V, f = 1MHz		710		pF
C _{oss}	Output Capacitance			155		pF
C _{rss}	Reverse Transfer Capacitance			145		pF
R _g	Gate resistance	V _{GS} = 0V, V _{DS} = 0V, f = 1MHz			3.0	Ω

SWITCHING PARAMETERS

Q _g (10V)	Total Gate Charge (10V)	V _{DD} = 20V, V _{GEN} = 10V, I _D = 9A		8		nC
Q _g (4.5V)	Total Gate Charge (4.5V)			6.2		nC
Q _{gs}	Gate Source Charge			3.3		nC
Q _{gd}	Gate Drain Charge			2.7		nC
t _{D(on)}	Turn-On DelayTime	V _{DD} = 15V, V _{GEN} = 10V, R _L = 15Ω R _{GEN} = 3Ω, I _D = 9A		7.0		ns
t _r	Turn-On Rise Time			7.0		ns
t _{D(off)}	Turn-Off DelayTime			22		ns
t _f	Turn-Off Fall Time			7.0		ns
t _{rr}	Body Diode Reverse Recovery Time	I _F = 10A, dI/dt = 100A/μs		24		ns
Q _{rr}	Body Diode Reverse Recovery Charge	I _F = 10A, dI/dt = 100A/μs		14		nC

A: The value of R_{θJA} is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with T_A = 25°C. The value in any given application depends on the user's specific board design. The current rating is based on the t_s ≤ 10s thermal resistance rating.

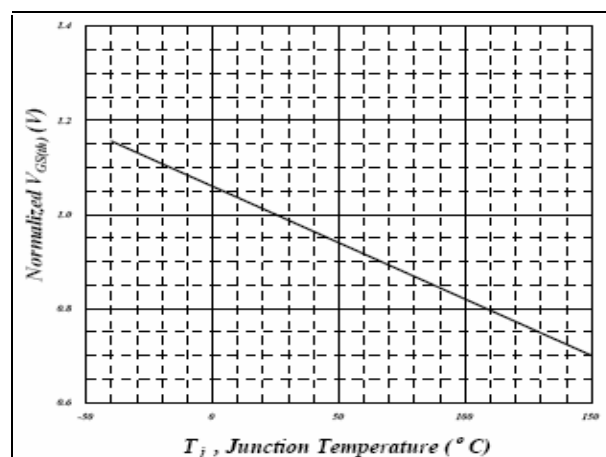
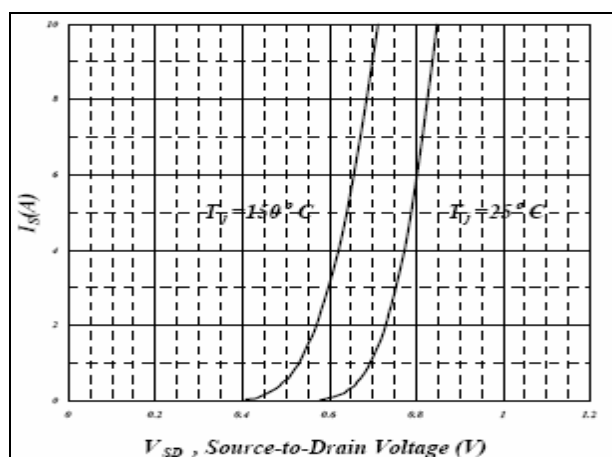
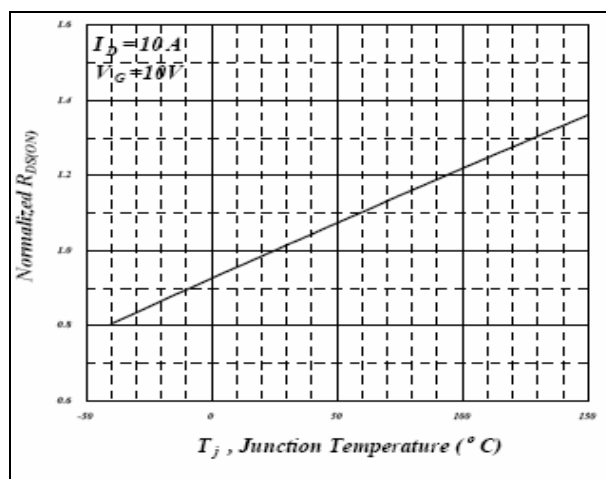
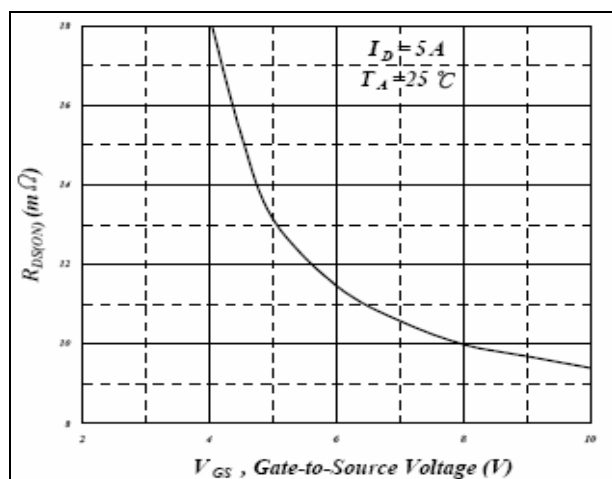
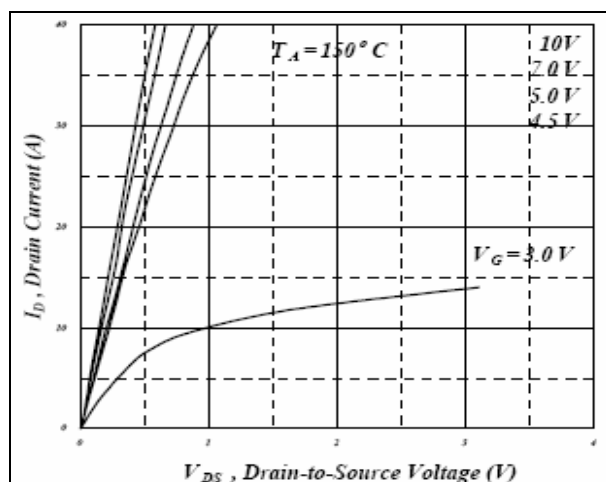
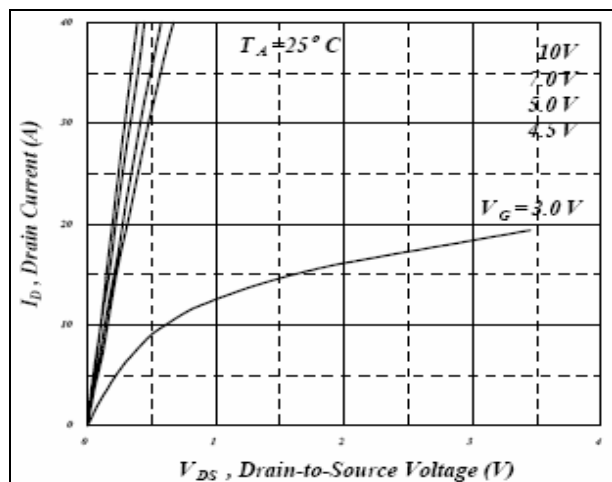
B: Repetitive rating, pulse width limited by junction temperature.

C: The R_{θJA} is the sum of the thermal impedance from junction to lead R_{θJL} and lead to ambient.

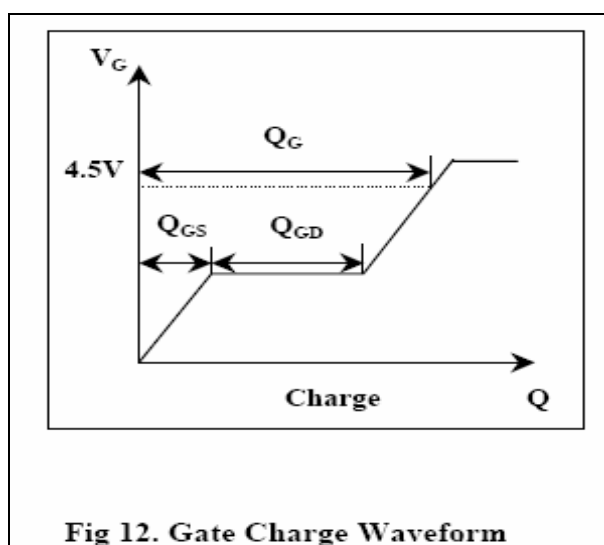
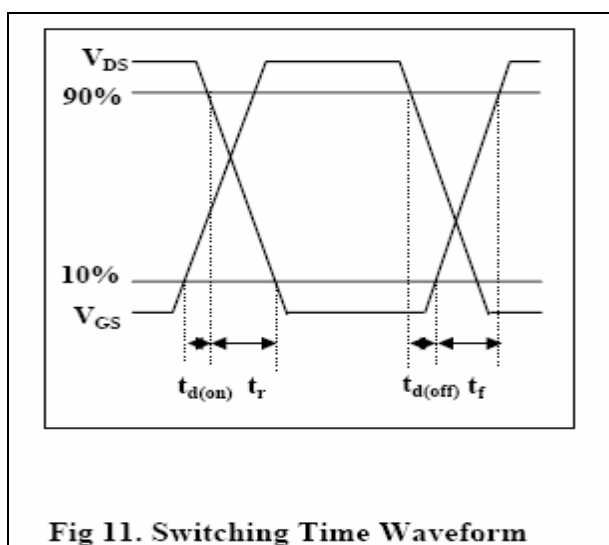
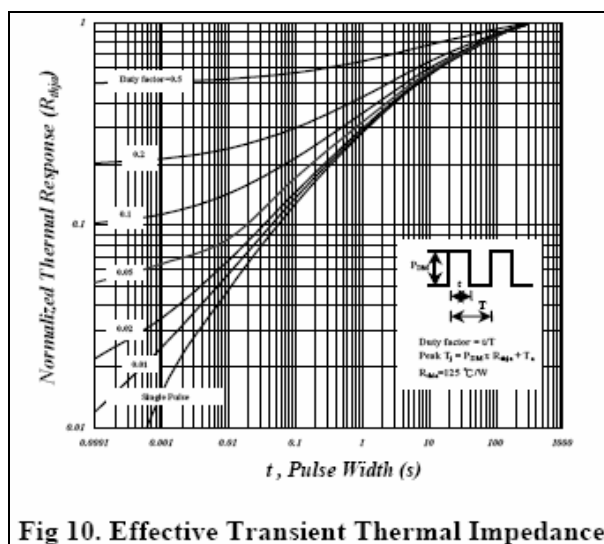
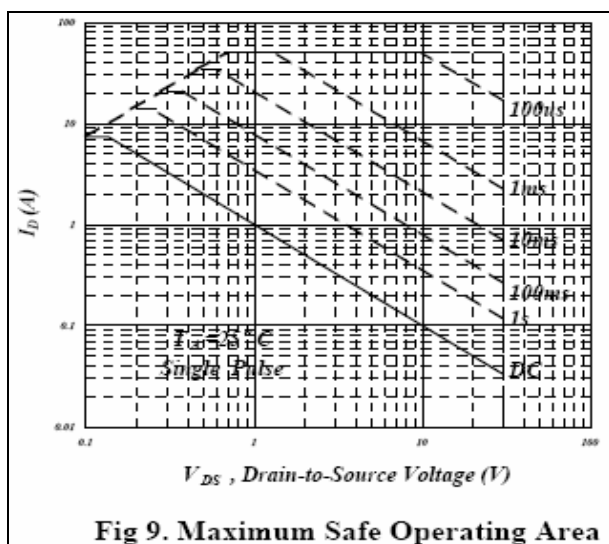
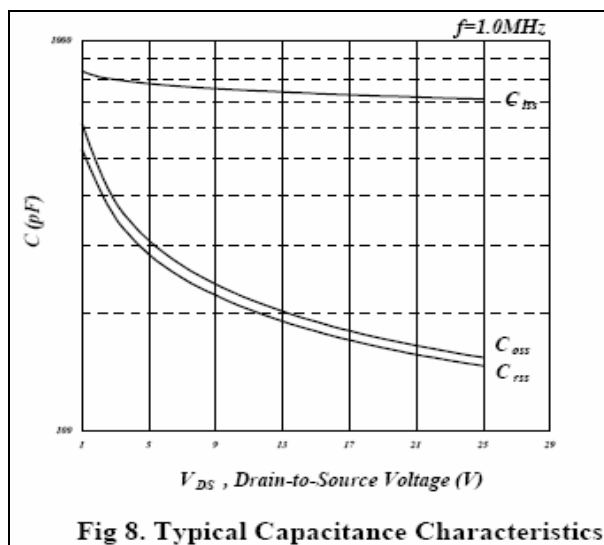
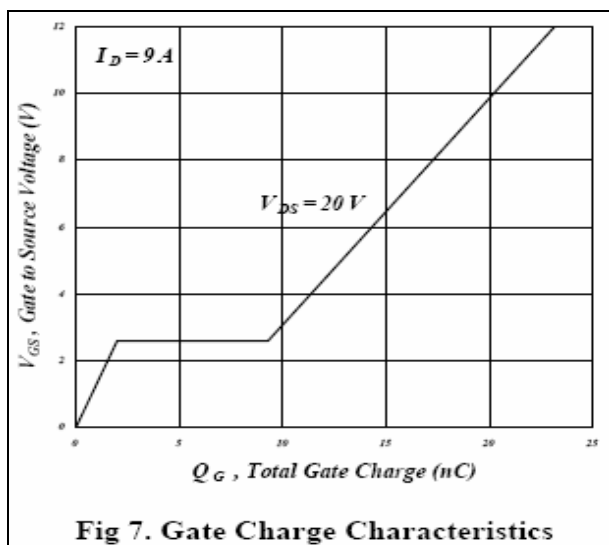
D: The static characteristics in Figures 1 to 6, 12, 14 are obtained using 80μs pulses, duty cycle 0.5% max.

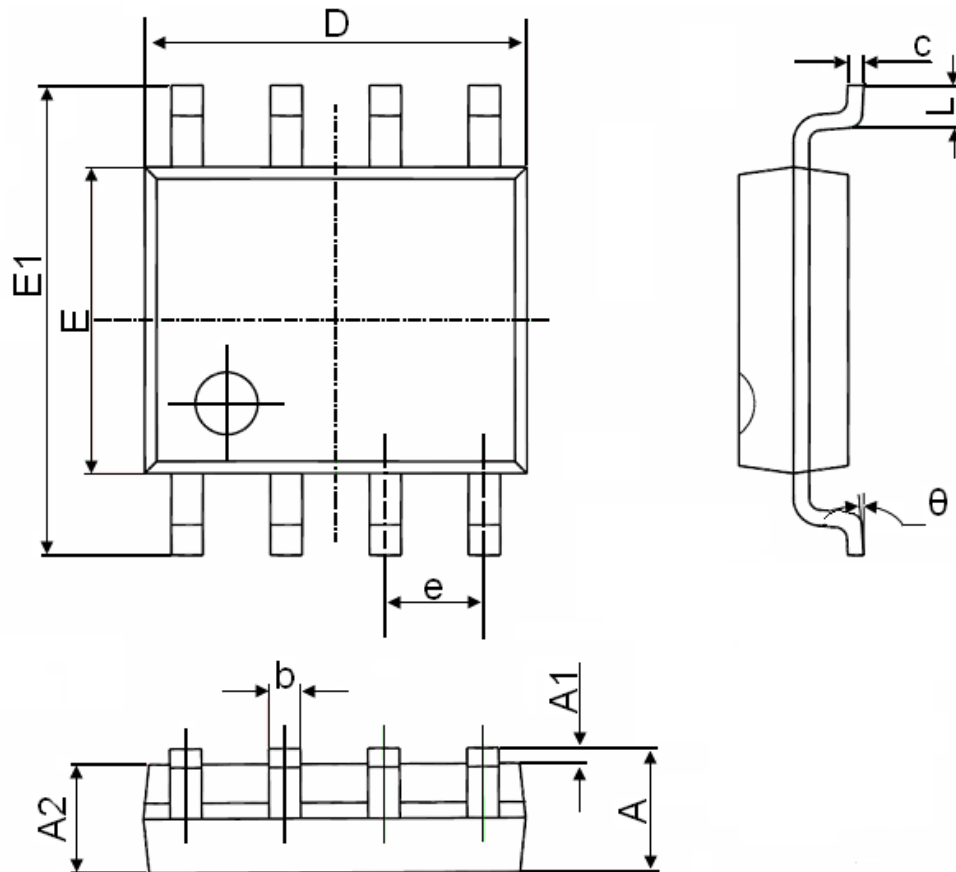
E: These tests are performed with the device mounted on 1 in² FR-4 board with 2oz. Copper, in a still air environment with T_A = 25°C. The SOA curve provides a single pulse rating.

Characteristics Curve



Characteristics Curve



SOP-8 Package Information


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°