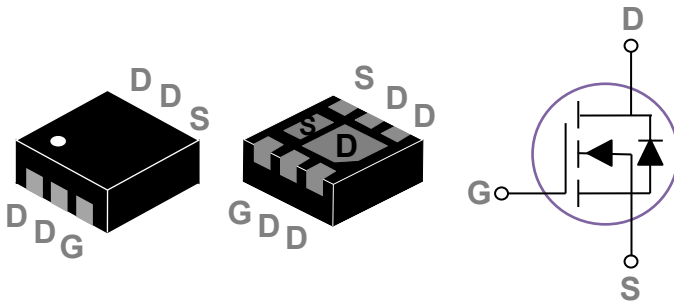


40V N-Channel MOSFETs

General Description

These N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency fast switching applications.

DFN2x2 Pin Configuration



BVDSS	RDSON	ID
40V	16mΩ	19A

Features

- 40V, 19A, $R_{DS(ON)} = 16m\Omega @ V_{GS} = 10V$
- Improved dv/dt capability
- Fast switching
- 100% EAS Guaranteed
- Green Device Available

Applications

- Notebook
- Load Switch
- Battery Protection
- Hand-held Instruments

Absolute Maximum Ratings $T_C=25^\circ C$ unless otherwise noted

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	40	V
V_{GS}	Gate-Source Voltage	+20V/-20V	V
I_D	Drain Current – Continuous ($T_A=25^\circ C$)	19	A
	Drain Current – Continuous ($T_A=70^\circ C$)	6.4	A
I_{DM}	Drain Current – Pulsed ¹	32	A
P_D	Power Dissipation ($T_A=25^\circ C$)	2	W
	Power Dissipation – Derate above $25^\circ C$	0.016	W/ $^\circ C$
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	62	$^\circ C/W$



FTK40N16DFN22

Electrical Characteristics (T_J=25 °C, unless otherwise noted)

Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	40	---	---	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =40V, V _{GS} =0V, T _J =25 °C	---	---	1	uA
		V _{DS} =32V, V _{GS} =0V, T _J =125 °C	---	---	10	uA
I _{GSS}	Gate-Source Leakage Current	V _{GS} =20V, V _{DS} =0V	---	---	100	nA

On Characteristics

R _{DS(ON)}	Static Drain-Source On-Resistance ³	V _{GS} =10V, I _D =2.5A	---	16	19	mΩ
		V _{GS} =4.5V, I _D =1.5A	---	20	26.0	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	1.2	1.7	2.5	V
g _{fs}	Forward Transconductance	V _{DS} =10V, I _D =1A	---	3	---	S

Dynamic and switching Characteristics

Q _g	Total Gate Charge ^{2, 3}	V _{DS} =20V, V _{GS} =10V, I _D =4A	---	5.6	8.4	nC
Q _{gs}	Gate-Source Charge ^{2, 3}		---	0.8	1.2	
Q _{gd}	Gate-Drain Charge ^{2, 3}		---	1.8	3	
T _{d(on)}	Turn-On Delay Time ^{2, 3}	V _{DD} =20V, V _{GS} =10V, R _G =25Ω I _D =4A	---	6	10	ns
T _r	Rise Time ^{2, 3}		---	21	32	
T _{d(off)}	Turn-Off Delay Time ^{2, 3}		---	18	28	
T _f	Fall Time ^{2, 3}		---	10	15	
C _{iss}	Input Capacitance	V _{DS} =20V, V _{GS} =0V, F=1MHz	---	450	675	pF
C _{oss}	Output Capacitance		---	190	285	
C _{rss}	Reverse Transfer Capacitance		---	15	25	
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, f=1MHz	---	2.1	---	Ω

Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _s	Continuous Source Current	V _G =V _D =0V, Force Current	---	---	19	A
I _{SM}	Pulsed Source Current ³		---	---	38	A
V _{SD}	Diode Forward Voltage ³	V _{GS} =0V, I _s =1A, T _J =25 °C	---	---	1	V
t _{rr}	Reverse Recovery Time	V _R =30V, I _s =4A	---	35	---	ns
Q _{rr}	Reverse Recovery Charge	di/dt=100A/μs, T _J =25 °C	---	20	---	nC

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
3. Essentially independent of operating temperature.

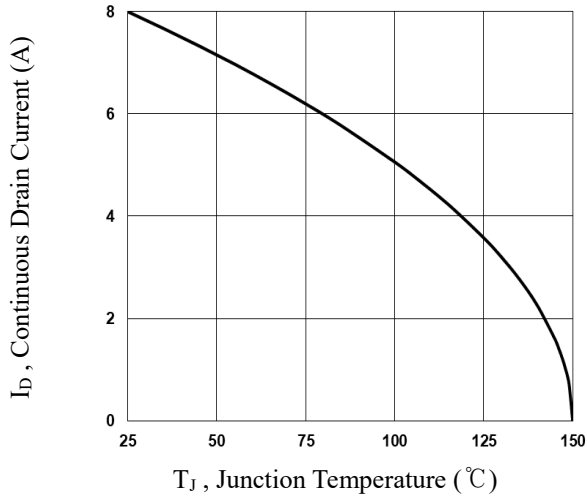


Fig.1 Continuous Drain Current vs. T_J

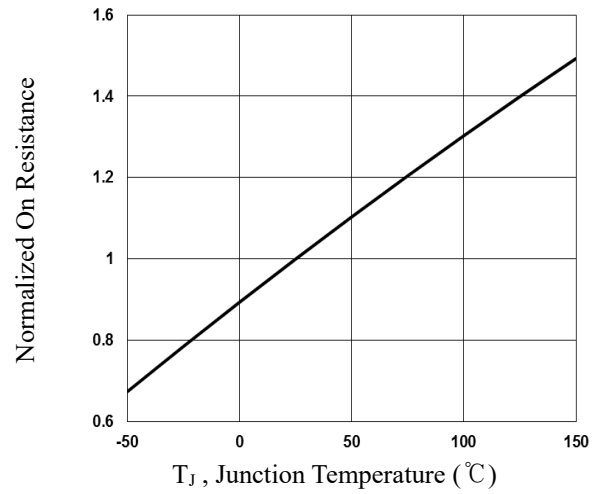


Fig.2 Normalized R_{DS(on)} vs. T_J

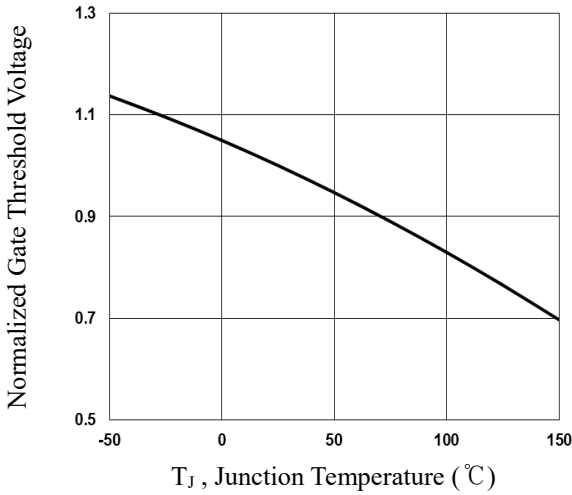


Fig.3 Normalized V_{th} vs. T_J

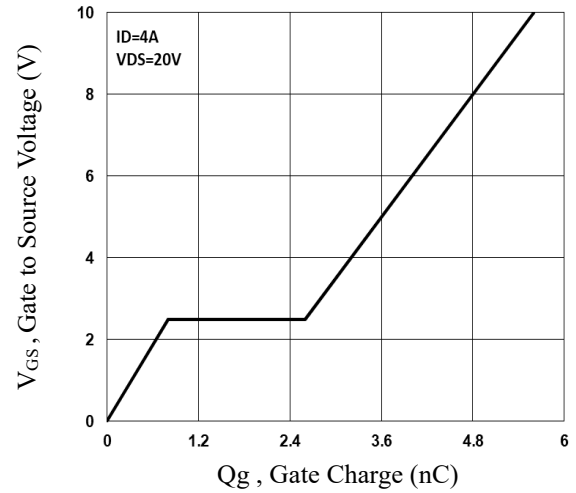


Fig.4 Gate Charge Waveform

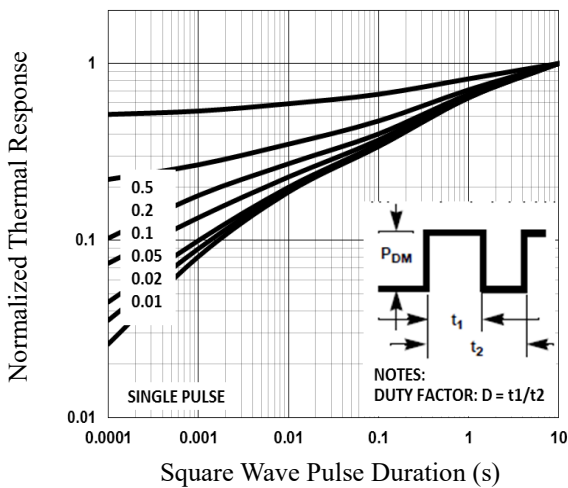


Fig.5 Normalized Transient Response

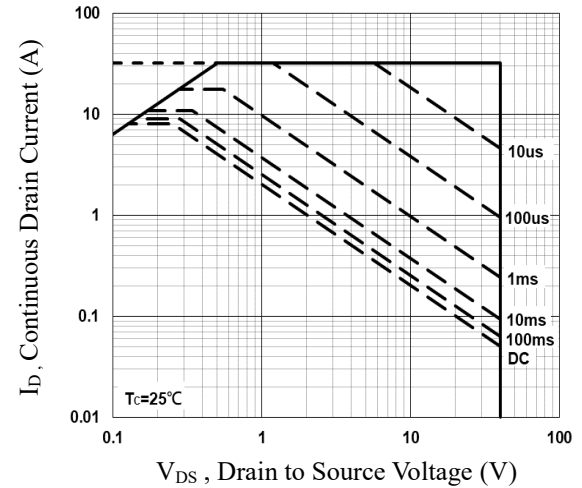


Fig.6 Maximum Safe Operation Area

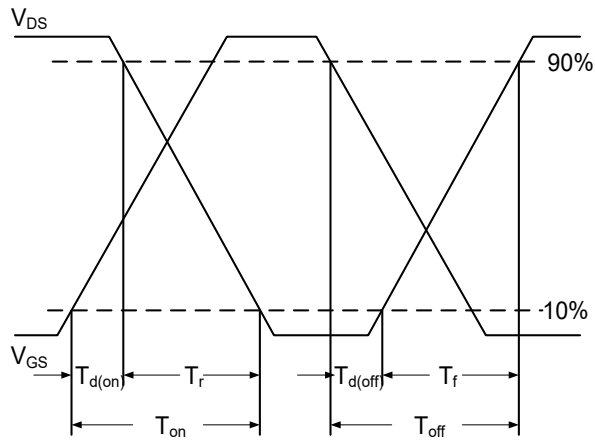


Fig.7 Switching Time Waveform

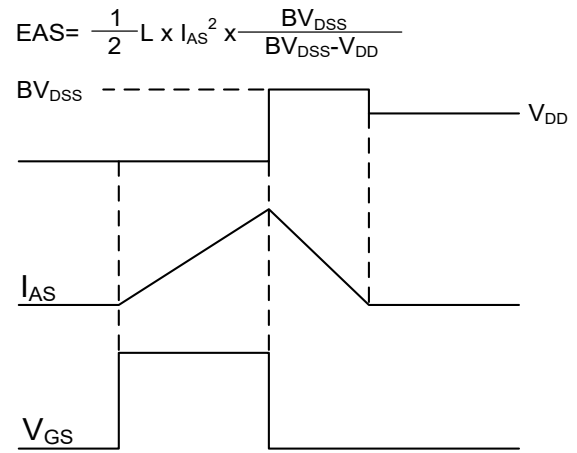
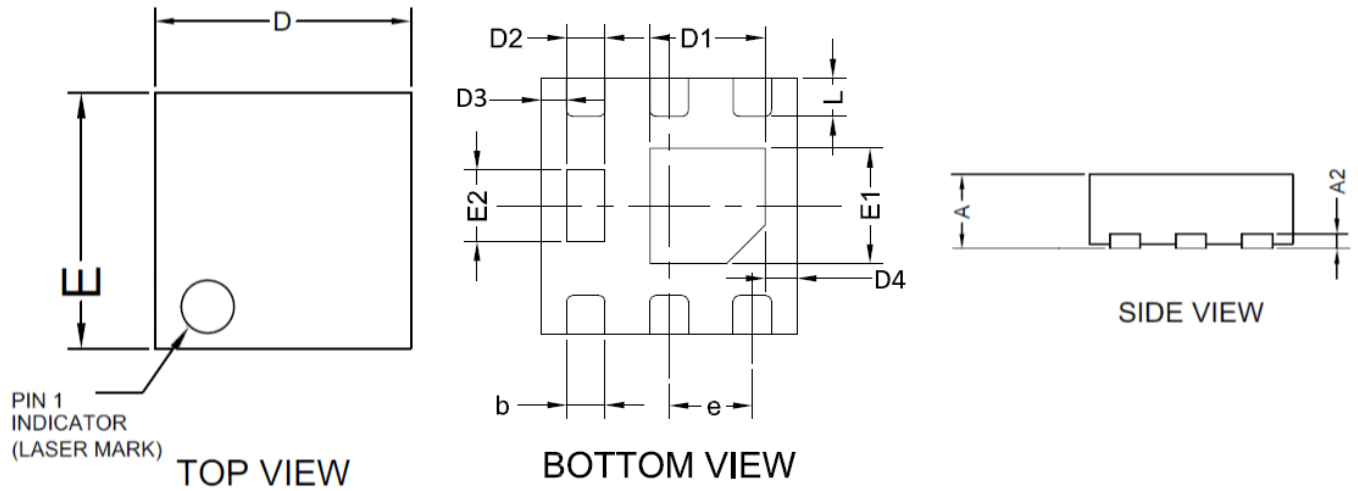


Fig.8 EAS Waveform

DFN2x2 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	0.800	0.500	0.031	0.019
A2	0.250	0.145	0.010	0.006
b	0.350	0.250	0.014	0.010
D	2.100	1.900	0.083	0.075
D1	1.000	0.800	0.040	0.031
D2	0.350	0.250	0.014	0.010
D3	0.200BSC		0.008BSC	
D4	0.200BSC		0.008BSC	
E	2.100	1.900	0.083	0.075
E1	1.050	0.800	0.041	0.031
E2	0.66	0.46	0.026	0.018
e	0.650BSC		0.026BSC	
L	0.350	0.250	0.014	0.010

DFN2x2 RECOMMENDED LAND PATTERN

