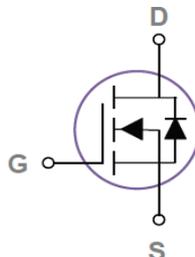




N-Channel Enhancement Mode MOSFET

Features

- ◆ $V_{DSS} = 650V$
- ◆ $R_{DS(ON)}$ Typ. 0.26Ω @ $V_{GS} = 10V$
- ◆ High ruggedness performance
- ◆ Super-Junction technology
- ◆ Pb Free & RoHS Compliant

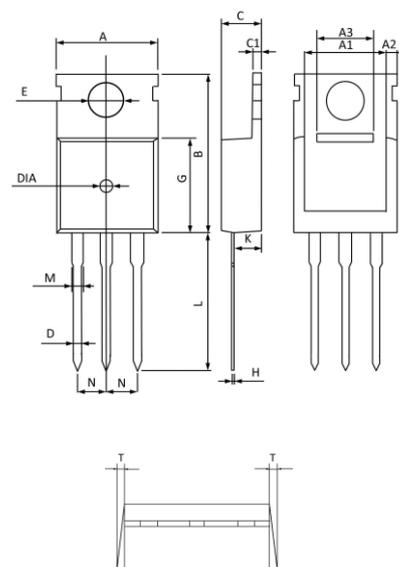


Applications

- ◆ Backlighting
- ◆ Power Converters
- ◆ Synchronous Rectifiers

Absolute Maximum Ratings (TA=25°C unless otherwise noted)

Parameter	Symbol	Ratings	Unit
Drain Source Voltage	V_{DS}	650	V
Gate Source Voltage	V_{GS}	±30	V
Drain Current Continuous @ $T_c = 25^\circ C$ @ $T_c = 100^\circ C$	I_D	15 9.5	A
Drain Current Pulsed @ $T_c = 25^\circ C$	I_{DM}	60	A
Single Pulse Avalanche Energy	EAS	400	mJ
Single Pulse Avalanche Current	IAS	6.3	A
Maximum Power Dissipation	P_D	104	W
Storage Temperature Range	T_{STG}	-55 to +150	°C
Operating Junction Temperature Range	T_J	-55 to +150	°C
Thermal Resistance Junction to Case <small>Note3</small>	$R_{\theta JC}$	1.2	°C/W



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	10.300	9.700	0.406	0.382
A1	8.840	8.440	0.348	0.332
A2	1.250	1.050	0.049	0.041
A3	5.300	5.100	0.209	0.201
B	16.200	15.400	0.638	0.606
C	4.680	4.280	0.184	0.169
C1	1.500	1.100	0.059	0.043
D	1.000	0.600	0.039	0.024
E	3.800	3.400	0.150	0.134
G	9.300	8.700	0.366	0.343
H	0.600	0.400	0.024	0.016
K	2.700	2.100	0.106	0.083
L	13.600	12.800	0.535	0.504
M	1.500	1.100	0.059	0.043
N	2.590	2.490	0.102	0.098
T	W0.35		W0.014	
DIA	Φ1.5 TYP.	deep0.2 TYP.	Φ0.059 TYP.	deep0.008 TYP.



Electrical Characteristics @ T_J=25°C (unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
OFF Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V , I _{DS} =250uA	650	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{GS} =0V , V _{DS} =650V	-	-	1	uA
Gate-Body Leakage	I _{GSS}	V _{GS} =±30V , V _{DS} =0V	-	-	±100	nA
ON Characteristics						
Gate Threshold Voltage	V _{TH}	V _{DS} =V _{GS} , I _{DS} =250uA	2	-	4	V
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =10V , I _{DS} =7.5A	-	0.26	0.29	Ω
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =50V	-	986	-	pF
Output Capacitance	C _{oss}	V _{GS} =0V	-	67.7	-	
Reverse Transfer Capacitance	C _{rss}	Freq.=1MHz	-	3.36	-	
Switching Characteristics						
Turn-On Delay Time	T _{d(on)}	V _{DD} =520V V _{GS} =10V R _G =25Ω I _{DS} =15A	-	30.9	-	ns
Rise Time	T _r		-	39.9	-	
Turn-Off Delay Time	T _{d(off)}		-	44.1	-	
Fall Time	T _f		-	49.7	-	
Total Gate Charge	Q _g	V _{DS} =520V	-	18	-	nC
Gate to Source Charge	Q _{gs}	V _{GS} =10V	-	5.9	-	
Gate to Drain Charge	Q _{gd}	I _{DS} =15A	-	6	-	
Drain-Source Diode Characteristics						
Diode Forward Voltage	V _{SD}	V _{GS} =0V , I _S =15A	-	-	1.4	V

Notes:

1. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
2. V_{DD}=100V, V_{GS}=10V, L=20mH, I_{AS}=6.3A, R_G=25Ω, Starting T_J=25°C
3. R_{θJA} is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins.
R_{θJC} is guaranteed by design while R_{θCA} is determined by the user's board design. R_{θJA} shown below for single device operation on FR-4 in still air.



Typical Characteristics

Fig.1 Continuous Drain Current vs. Tc

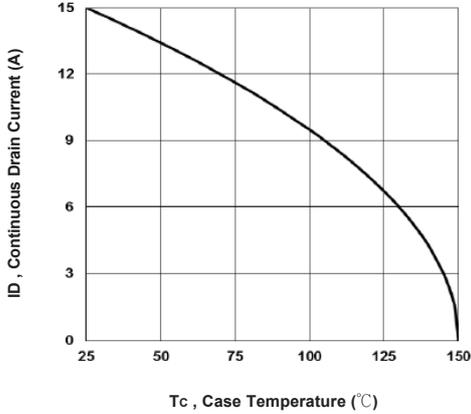


Fig.2 Normalized RDSON vs. Tj

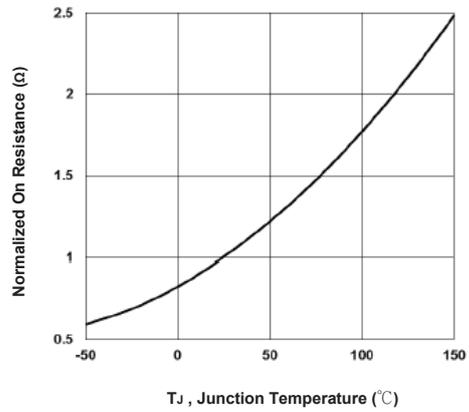


Fig.3 Normalized Vth vs. Tj

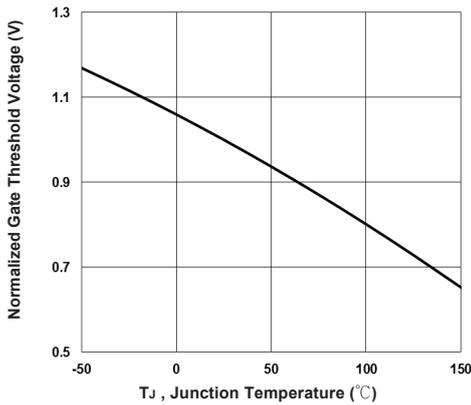


Fig.4 Gate Charge Waveform

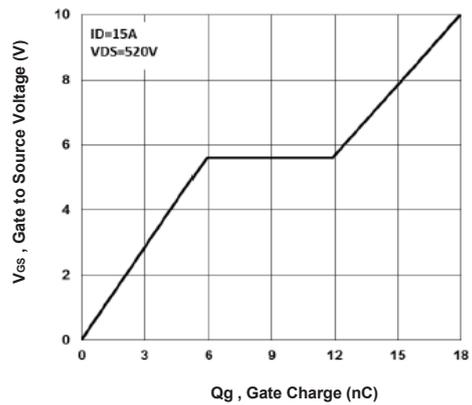


Fig.5 Normalized Transient Impedance

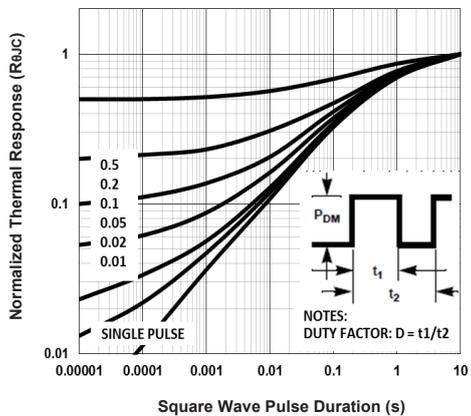
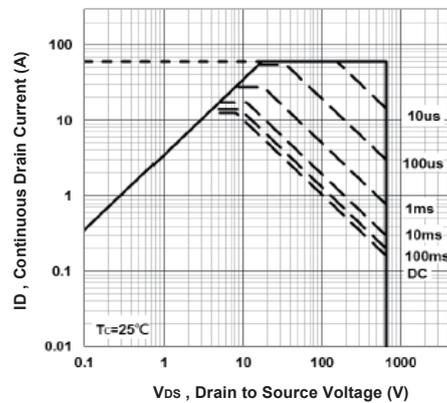


Fig.6 Maximum Safe Operation Area





Typical Characteristics

Fig.7 Switching Time Waveform

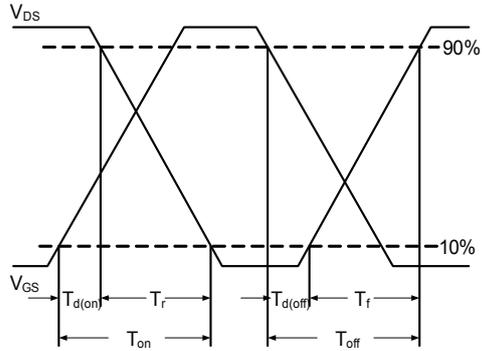
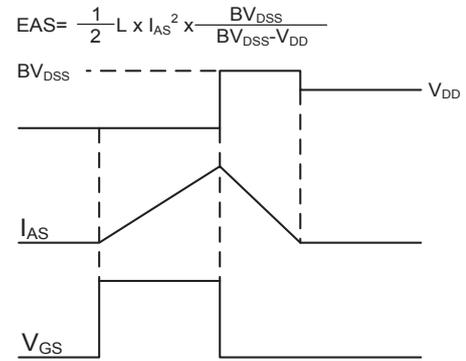


Fig.8 EAS Waveform



$$EAS = \frac{1}{2} L \times I_{AS}^2 \times \frac{BV_{DSS}}{BV_{DSS} - V_{DD}}$$