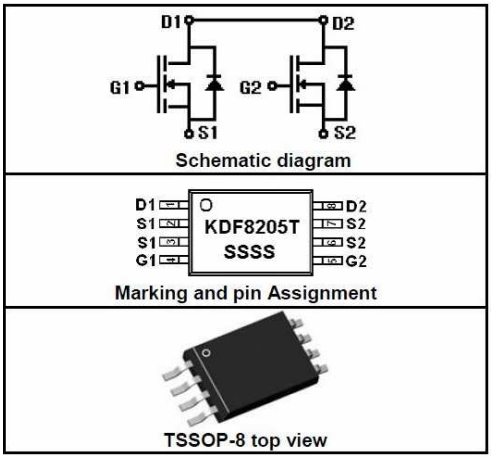
N-Channel MOSFET *Preliminary*

Features

- 20V,6A,Rds(on)<37.5mΩ@Vgs=2.5V
- 20V,6A,Rds(on)<27.5mΩ@Vgs=4.5V
- Fast Switching
- Surface Mount Package
- Ideal for Li Ion Battery Pack Applications



General Description

This Power MOSFET is produced using KEDA's advanced Trench MOS Technology. This latest technology has been especially designed to minimize on-state resistance, have a high rugged avalanche characteristics. These devices are well suited for low voltage application such as Li Ion Battery, DC/DC converters,and high efficiency switch for power management in portable and battery products.

Absolute Maximum Ratings

Symbol	Parameter	Value	Units
V_{DSS}	Drain-Source Voltage	20	V
I_D	Continuous Drain Current (T_C=25℃)	6	A
I_{DM}	Pulsed Drain Current (Note 1)	30	A
V_{GS}	Gate-Source Voltage	± 12	V
P_D	Maximum Power Dissipation (T_C=25℃)	1.5	W
	Derating Factor above 25℃	0.96	W/℃
T_J	Operating Junction Temperature Range	-55 to +150	℃
T_{STG}	Storage Temperature Range	-55 to +150	℃

Thermal Characteristics

Symbol	Parameter	Max.	Units
$R_{th\ j\text{-}a}$	Thermal Resistance, Junction to Ambient	83	℃/ W

Electrical Characteristics (T_C=25℃ unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	20	-	-	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=18V, V_{GS}=0V	-	-	1	uA
I_{GSS}	Gate Leakage Current, Forward	V_{GS}=8V, V_{DS}=0V	-	-	100	nA
	Gate Leakage Current, Reverse	V_{GS}=-8V, V_{DS}=0V	-	-	-100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS}, I_D=250uA	0.5	-	1.2	V
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS}=2.5V, I_D=5A	-	30	37.5	mΩ
		V_{GS}=4.5V, I_D=6A	-	25	27.5	
Q_g	Total Gate Charge	V_{DD}=10V V_{GS}=4.5V I_D=6A (Note 2)	-	4.86	-	nC
Q_{gs}	Gate-Source Charge		-	0.92	-	nC
Q_{gd}	Gate-Drain Charge		-	1.4	-	nC
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=10V,V_{GS}=4.5V I_D=1A,R_G=6Ω T_C=25 ℃ (Note 2)	-	9	-	ns
t_r	Turn-on Rise Time		-	10	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	22	-	ns
t_f	Turn-off Fall Time		-	6	-	ns
C_{iss}	Input Capacitance	V_{DS}=8V V_{GS}=0V f = 100KHz	-	562	-	pF
C_{oss}	Output Capacitance		-	106	-	pF
C_{rss}	Reverse Transfer Capacitance		-	75	-	pF

Source-Drain Diode Characteristics (T_C=25℃ unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
I_S	Continuous Source Diode Forward Current		-	-	1.7	A
V_{SD}	Forward On Voltage	V_{GS}=0V, I_S1.7A	-	-	1.2	V

Notes：

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. Pulse Width ≤ 300 us; Duty Cycle≤2%

Test Circuits and Waveform

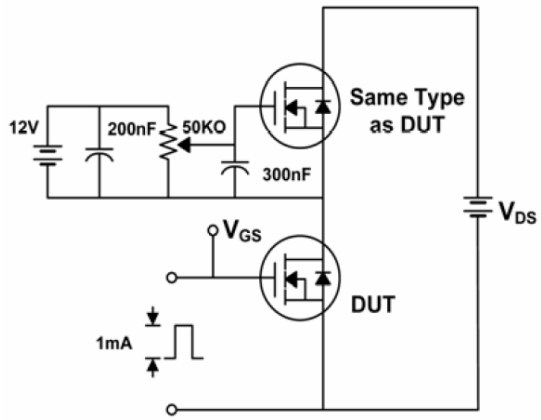


Fig.1 Gate Charge Test Circuit

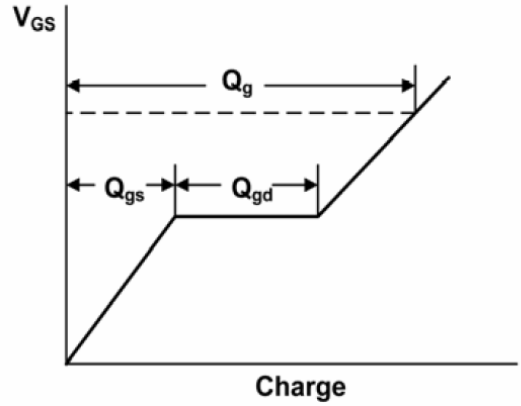


Fig.2 Gate Charge Waveform

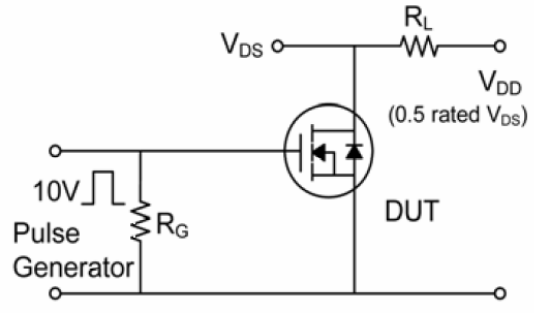


Fig.3 Switching time Test Circuit

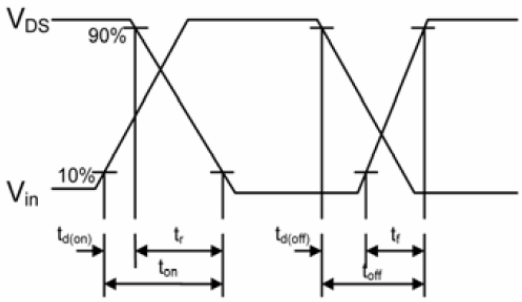


Fig.4 Switching time Waveform

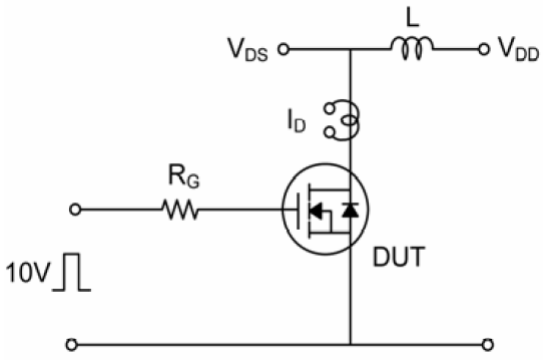


Fig.5 Unclamped Inductive Switching Test Circuit

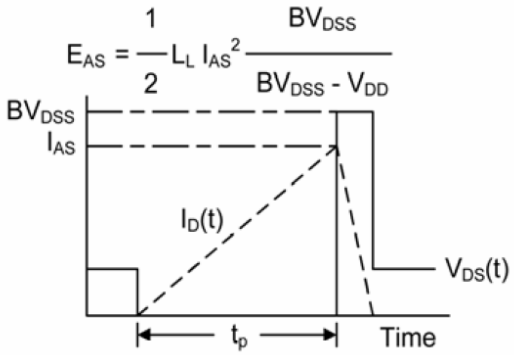


Fig.6 Unclamped Inductive Switching Waveform

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