Product Manual

EKWIN ELECTRONICS CO.,LTD

EK 60NF06

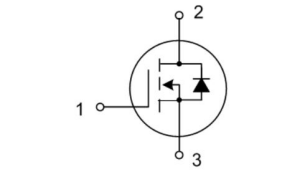
www.ekwin.net

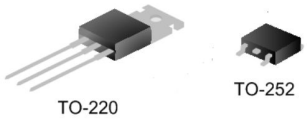
EK60NF06

N-CHANNEL MOSFET

Product Summary :

TYPE	VDSS	RDS(on) Typ.	ID
60NF06	60V	10.5mΩ	60A





Features :

- 100% Avalanche Test
- Simple Drive Requireme
- Fast switching
- Low gate charge
- Low Crss
- Improved dv/dt capability

General Description :

EK60NF06 is an N channel enhancement mode power MOS field effect transistor which is produced by EKWIN. The advanced trench technology and the improved guard ring terminal have been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode.

Application :

- **LED power drivers.**
- **AC-DC power suppliers.**
- **DC- DC converters**
- **H-bridge PWM motor drivers.**
- **Power Management for Inverter Systems.**

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

Symbol	Characteristics	Test conditions	Min	Typ	Max	Unit
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}= V_{DS}, I_D=250μA	2.2	3	3.8	V
$R_{DS(on)}$	Static Drain- Source On State Resistance	V_{GS}= 10V, I_D=10A	-	10.5	20	mΩ
BV_{DSS}	Drain -Source Breakdown Voltage	V_{GS}= 0V, I_D=250μA	60	-	-	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=48V, V_{GS}=0V	-	-	1.0	μA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
C_{iss}	Input Capacitance	V_{DS}=25V,V_{GS}=0V f=1.0MHZ	-	3000	-	pF
C_{oss}	Output Capacitance		-	170	-	
C_{rss}	Reverse Transfer Capacitance		-	140	-	
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=30V,I_D=30A R_G=3Ω (Note2,3)	-	49	-	ns
t_r	Turn-on Rise Time		-	230	-	
$t_{d(off)}$	Turn-off Delay Time		-	65	-	
t_f	Turn-off Fall Time		-	110	-	
Qg	Total Gate Charge	V_{DS}=48V,I_D=30 A V_{GS}=10V (Note2,3)	-	56	-	nC
Q_{gs}	Gate-Source Charge		-	16	-	
Q_{gd}	Gate-Drain Charge		-	18	-	

Thermal Characteristics

Symbol	Characteristics	Ratings	Unit
		60NF06	
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	1.14	°C/W
$R_{\theta JA}$	Thermal Resistance,Junction-to-Ambient	62.5	°C/W

Absolute Maximum Ratings (TC=25℃ unless otherwise noted)

Symbol	Characteristics		Ratings	Unit
			60NF06	
VDS	Drain-Source Voltage		60	V
VGS	Gate-Source Voltage		±20	V
ID	Drain Curren	TC=25°C	60	A
		TC=100°C	31.62	
IDM	Drain Current Pulsed		200	A
PD	Power Dissipation(TC=25°C)		110	W
	Derate above 25°C		0.88	W/°C
EAS	Single Pulsed Avalanche Energy(Note1)		220	mJ
TJ	OperationJunction Temperature Range		-55～+150	°C
Tstg	Storage Temperature Range		-55～+150	°C

Source-Drain Diode Ratings And Characteristics

Symbol	Characteristics	Test conditions	Min	Typ	Max	Unit
IS	Continuous Source Current	Integral Reverse P-N unction	-	-	60.0	A
ISM	Pulsed Source Current	Diode in the MOSFET	-	-	200	
VSD	Diode Forward Voltage	IS=60A,VGS=0V	-	-	1.5	V
Trr	Reverse Recovery Time	IS=60A,VGS=0V , dIF/dt=100A/μS	-	67.2	-	ns
Q rr	Reverse Recovery Charge		-	0.2	-	μC

Notes:

1. L=0.5mH, IAS=53A, VDD=30V, RG=20Ω, starting TJ=25°C;
2. Pulse Test: Pulse width ≤300μs,Duty cycle≤2%;
3. Essentially independent of operating temperature.

Typical Characteristics

Figure 1 Output characteristics

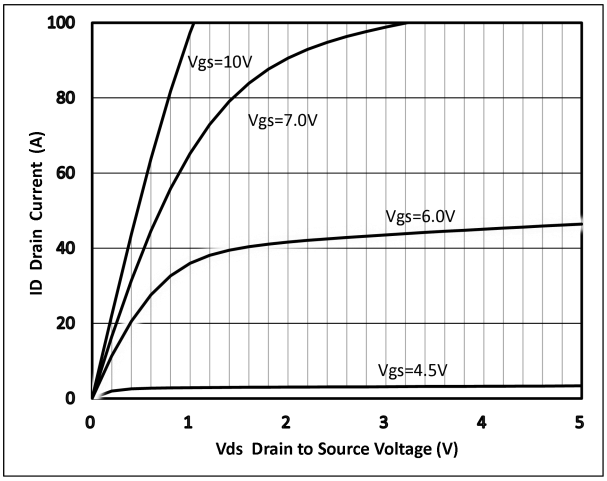


Figure 2 Transfer Characteristics

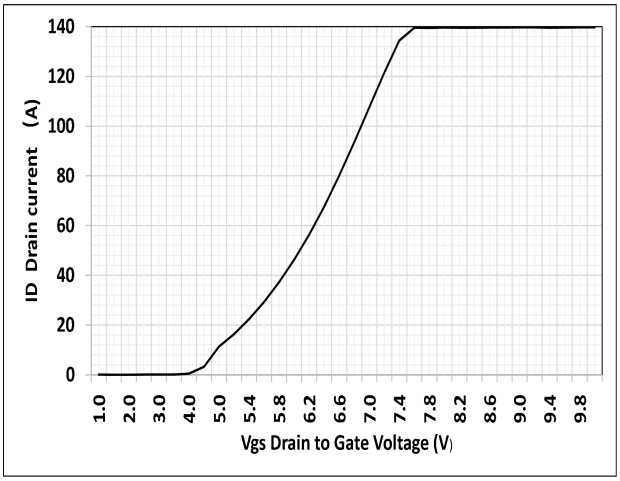


Figure 3 On-Resistance vs Id

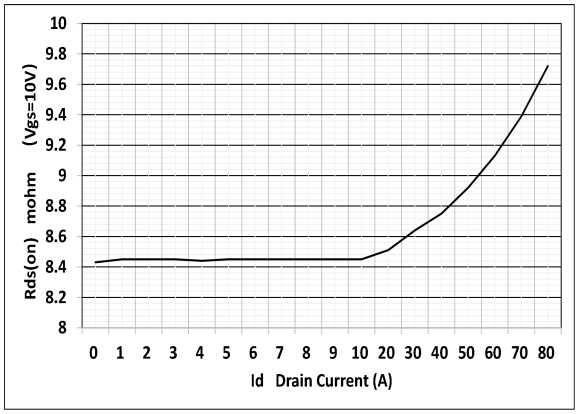


Figure 4 On-Resistance vs Vgs

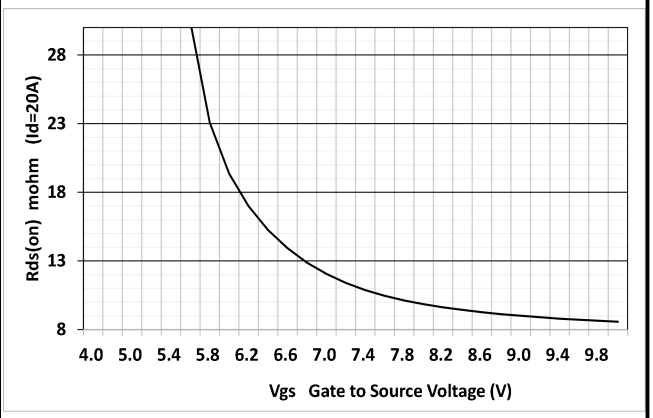


Figure 5 Body Diode Forward Voltage

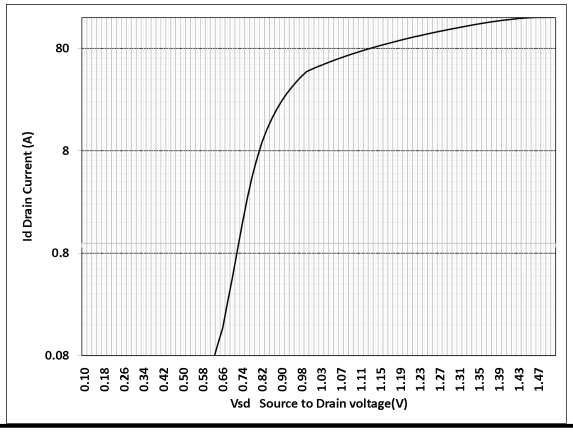
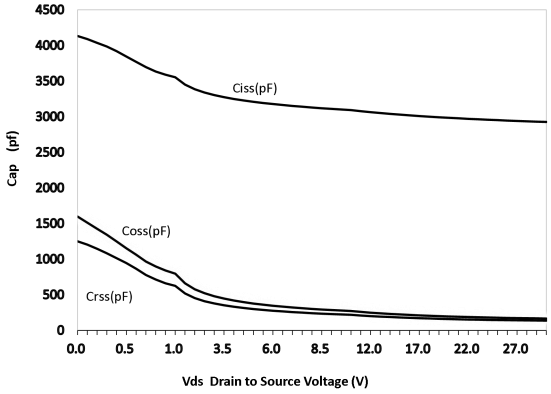
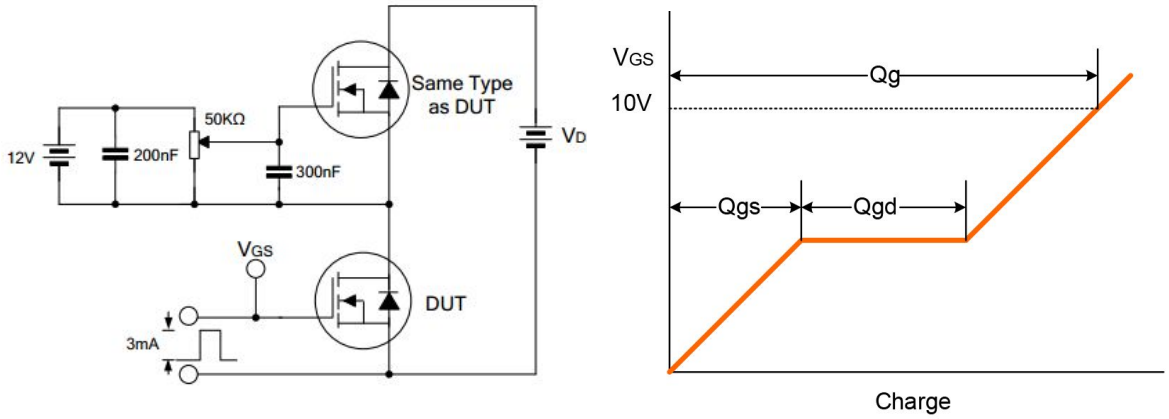


Figure 6 Capacitance Characteristics

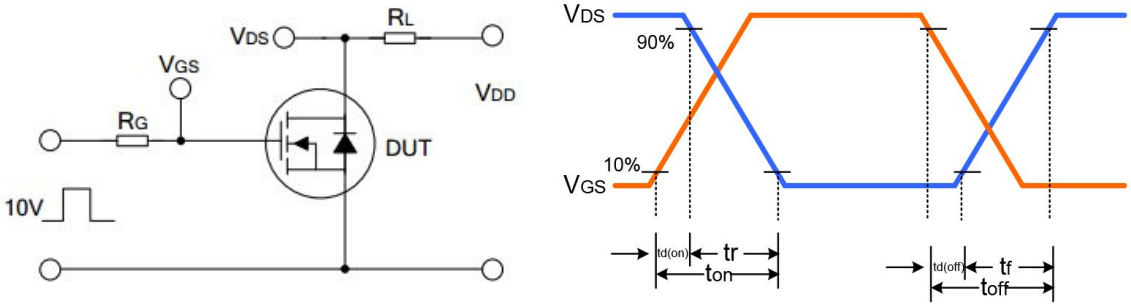


Typical Test Circuit

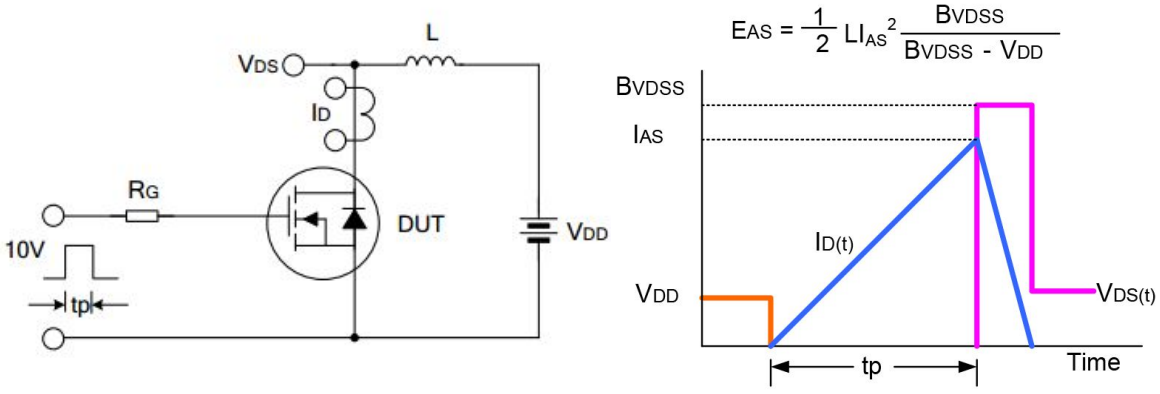
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveform

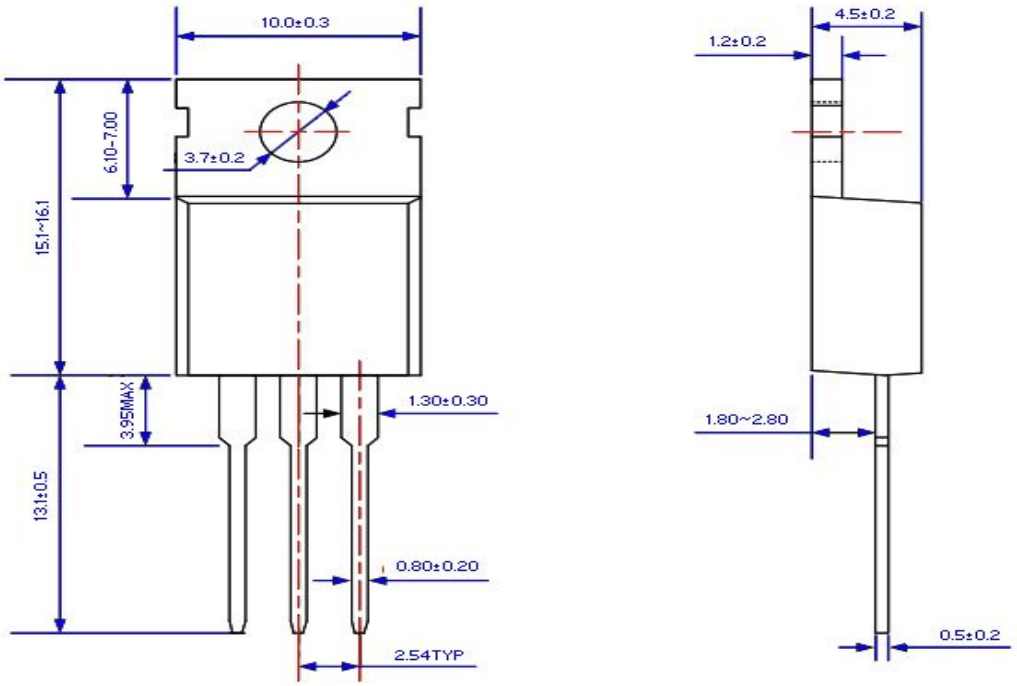


Unclamped Inductive Switching Test Circuit & Waveform



Package Outline TO-220

UNIT：mm



TO-252

UNIT:mm