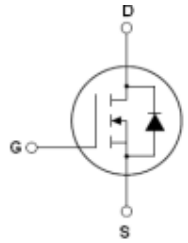
Description

The EC736014 is a new generation of middle voltage and high current N–Channel enhancement mode trench power MOSFET. This new technology increases the device reliability and electrical parameter repeatability. EC736014 is assembled in high reliability and qualified assembly house.

ID =60A
BV=60V
Rdson=14mΩ(max.)

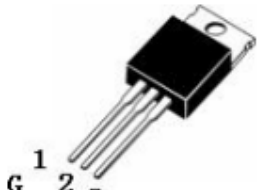


Features and Benefits

- Advanced trench process technology
- avalanche energy, 100% test
- Fully characterized avalanche voltage and current

Application

- Power switching application



TOP View (TO220)

Absolute Maximum Ratings

	Parameter	Max.	Units
I_D@Tc=25˚C	Continuous drain current,V_{GS}@10V	60	A
I_D@Tc=100℃	Continuous drain current,V_{GS}@10V	42	
I_{DM}	Pulsed drain current ①	240	
P_D@T_C=25℃	Power dissipation	115	W
P_D@T_C=25℃	Linear derating factor	0.74	W/ C˚
V_{GS}	Gate-to-Source voltage	±20	V
E_{AS}	Single pulse avalanche energy ②	235	mJ
E_{AR}	Repetitive avalanche energy	TBD	
T_J T_{STG}	Operating Junction and Storage Temperature Range	–55 to +175	℃

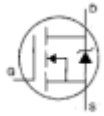
Thermal Resistance

	Parameter	Min.	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-case	—	1.31	—	℃/W
$R_{\theta JA}$	Junction-to-ambient	—	—	62	

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

	Parameter	Min.	Typ.	Max.	Units	Test Conditions
BV_{DSS}	Drain-to-Source breakdown voltage	60	—	—	V	V_{GS}=0V,I_D=250μA
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	12	14	mΩ	V_{GS}=10V,I_D=30A
$V_{GS(th)}$	Gate threshold voltage	2.0		4.0	V	V_{DS}=V_{GS},I_D=250μA
gfs	Forward transconductance	—	60	—	S	V_{DS}=5V,I_D=30A
I_{DSS}	Drain-to-Source leakage current	—	—	2	μA	V_{DS}=60V,V_{GS}=0V
		—	—	10	μA	V_{DS}=60V, V_{GS}=0V,T_J=150℃
I_{GSS}	Gate-to-Source forward leakage	—	—	100	nA	V_{GS}=20V
	Gate-to-Source reverse leakage	—	—	-100	nA	V_{GS}=-20V
Qg	Total gate charge	—	45	—	nC	I_D=30A
Qgs	Gate-to-Source charge	—	4	—		V_{DD}=30V
Qgd	Gate-to-Drain("Miller") charge	—	15	—		V_{GS}=10V
$t_{d(on)}$	Turn-on delay time	—	14.6	—	nS	V_{DD}=30V
tr	Rise time	—	14.2	—		I_D=2A ,R_L=15Ω
$t_{d(off)}$	Turn-Off delay time	—	40	—		R_G=2.5Ω
tf	Fall time	—	7.3	—		V_{GS}=10V
Ciss	Input capacitance	—	1480	—	pF	V_{GS}=0V
Coss	Output capacitance	—	190	—		V_{DS}=25V
Crss	Reverse transfer capacitance	—	135	—		f=1.0MHZ

Source-Drain Ratings and Characteristics

	Parameter	**Min.**	**Typ.**	**Max.**	**Units**	**Test Conditions**
I_S	Continuous Source Current (Body Diode)	—	—	60	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode) ①	—	—	240		
V_{SD}	Diode Forward Voltage	—	—	1.3	V	T_J=25℃,I_S=40A,V_{GS}=0V ③
trr	Reverse Recovery Time	—	33	—	nS	T_J=25℃,I_F=60A di/dt=100A/μs ③
Qrr	Reverse Recovery Charge	—	61	—	nC	
ton	Forward Turn-on Time	Intrinsic turn-on time is negligible (turn-on is dominated by Ls + LD)				

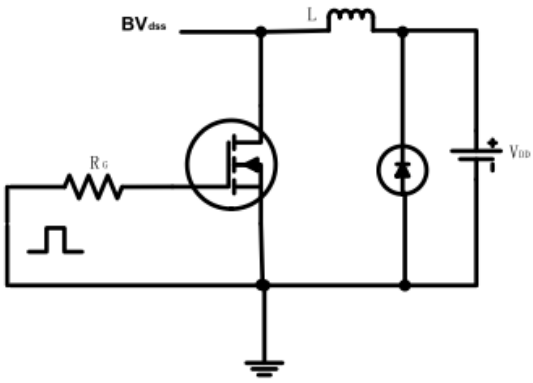
Notes:

① Repetitive rating; pulse width limited by max junction temperature.

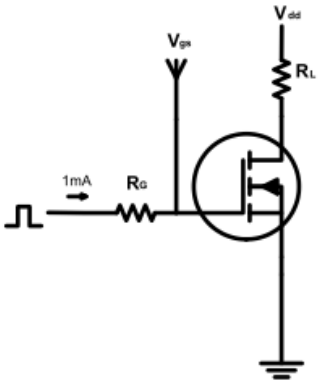
② Test condition: L =0.3mH, VDD = 30V,Id=37A

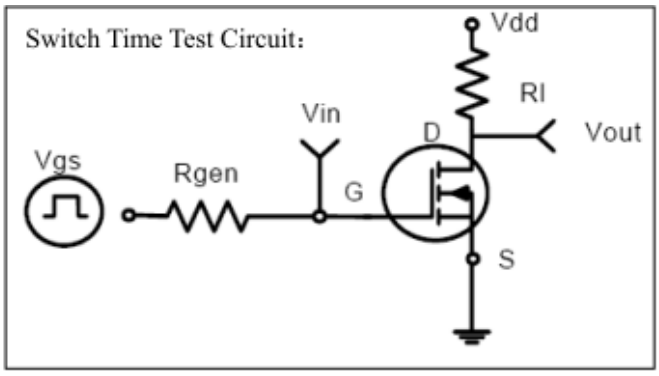
③ Pulse width≤300μS, duty cycle≤1.5% ; RG = 25Ω Starting TJ = 25℃

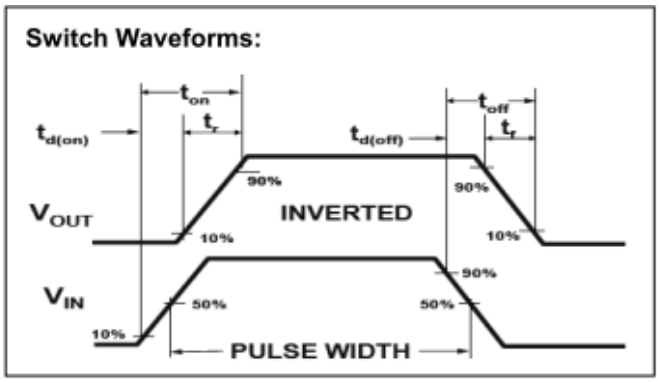
EAS test circuit:

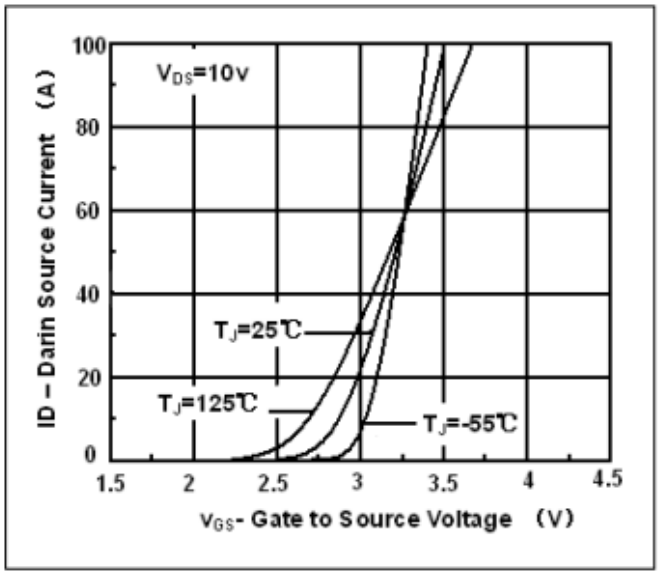


Gate charge test circuit:

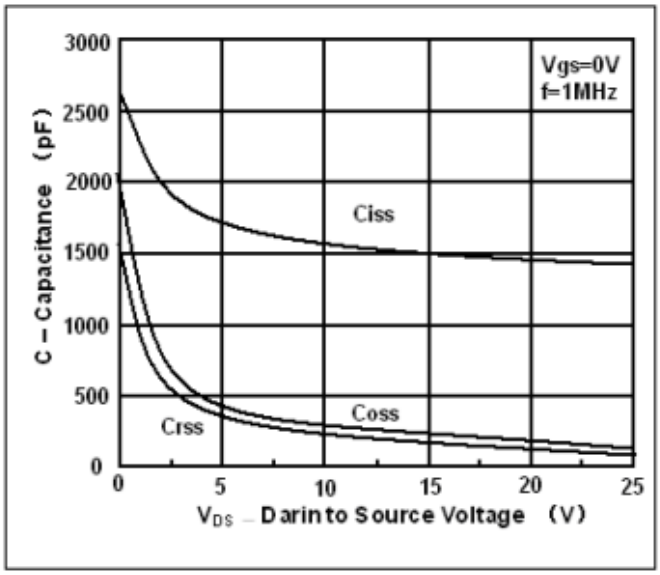




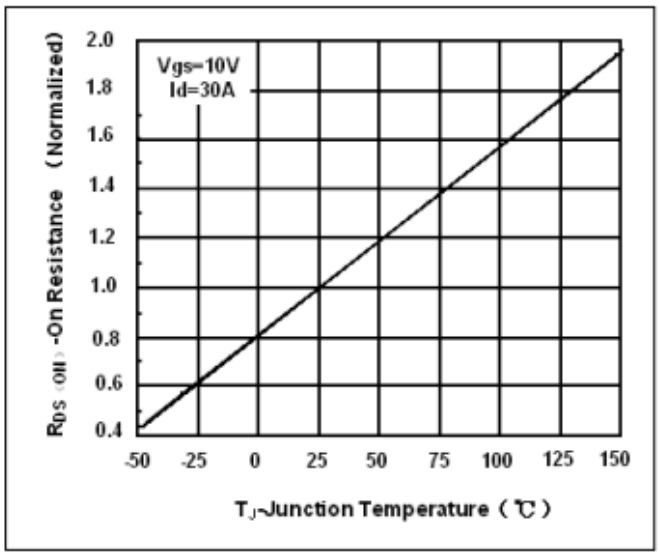




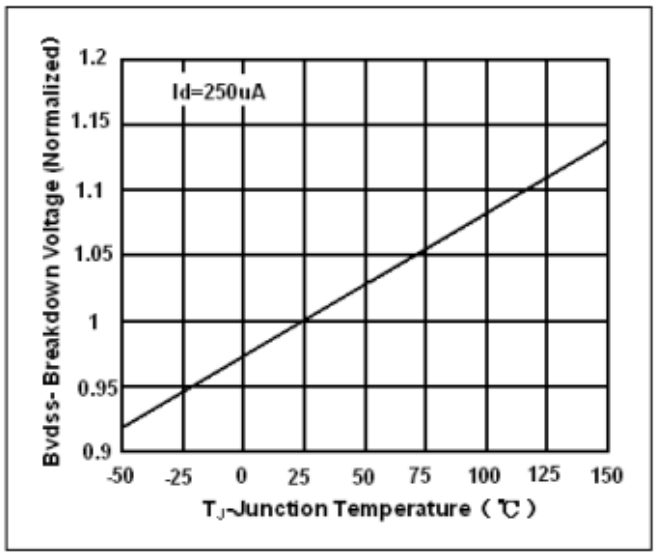
Transfer Characteristic



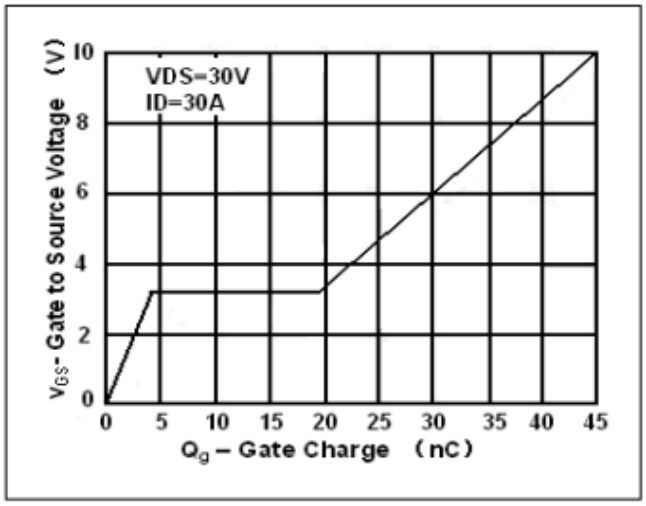
Capacitance



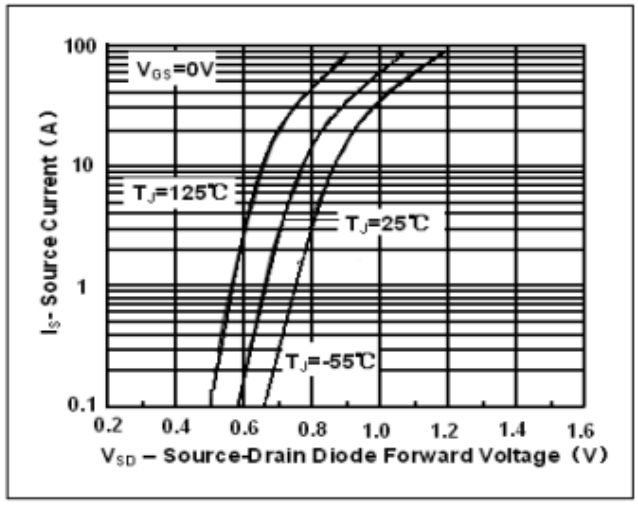
On Resistance vs. Junction Temperature



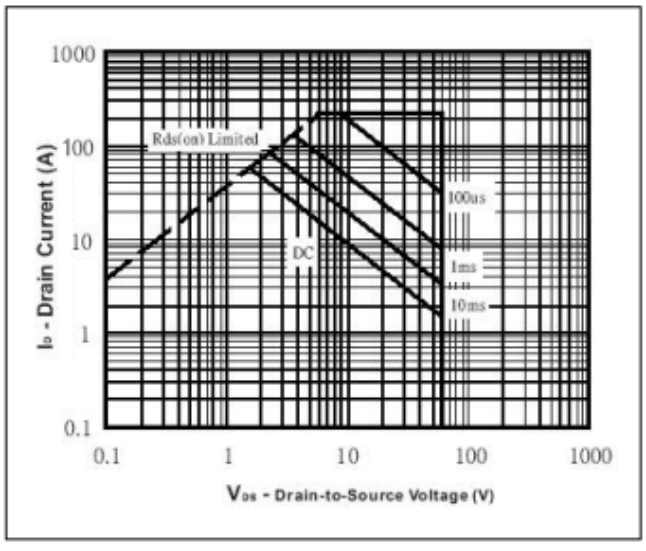
Breakdown Voltage vs. Junction Temperature



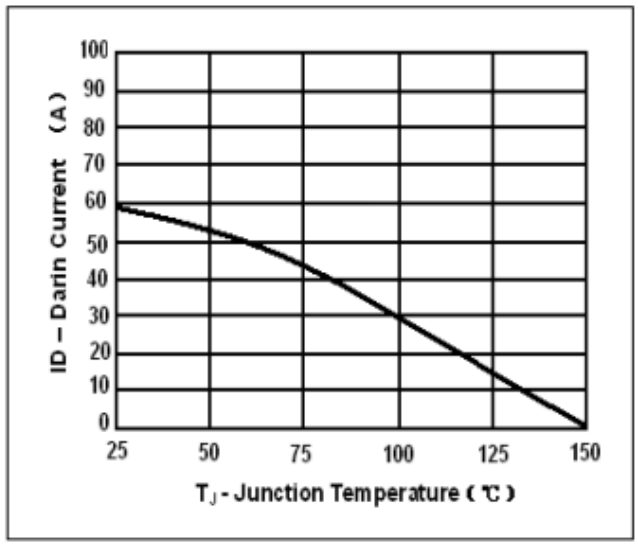
Gate Charge



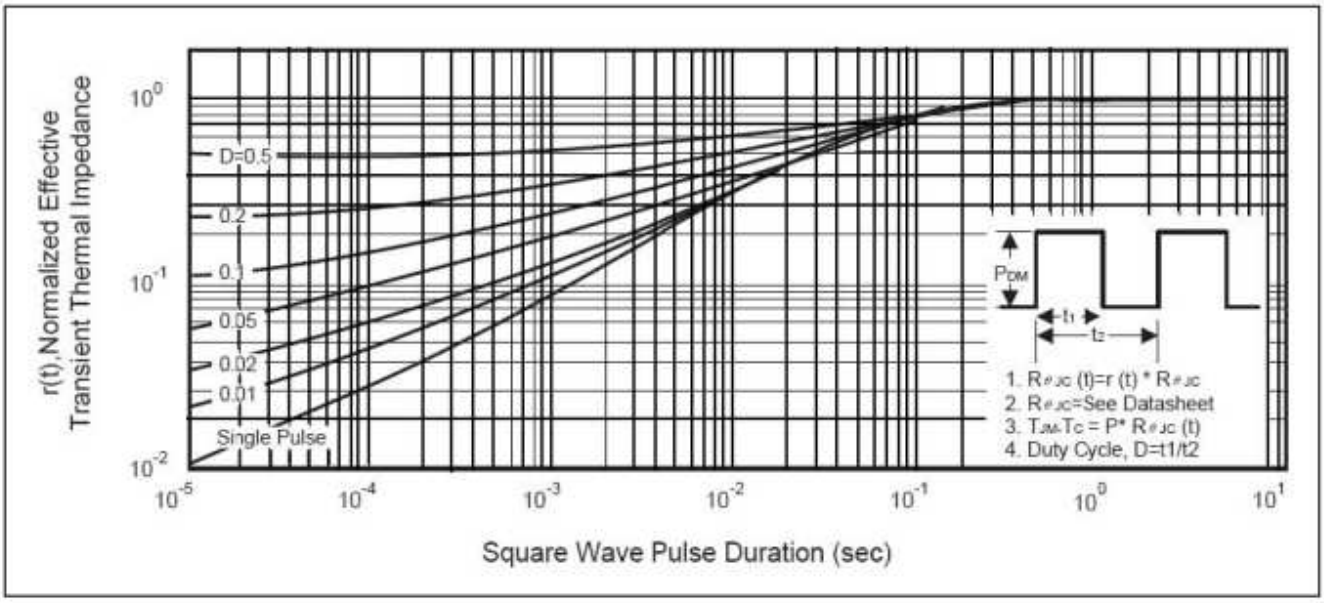
Source-Drain Diode Forward Voltage



Safe Operation Area



Max Drain Current vs. Junction Temperature



Transient Thermal Impedance Curve

Ordering and Marking Information

EC736014 X X

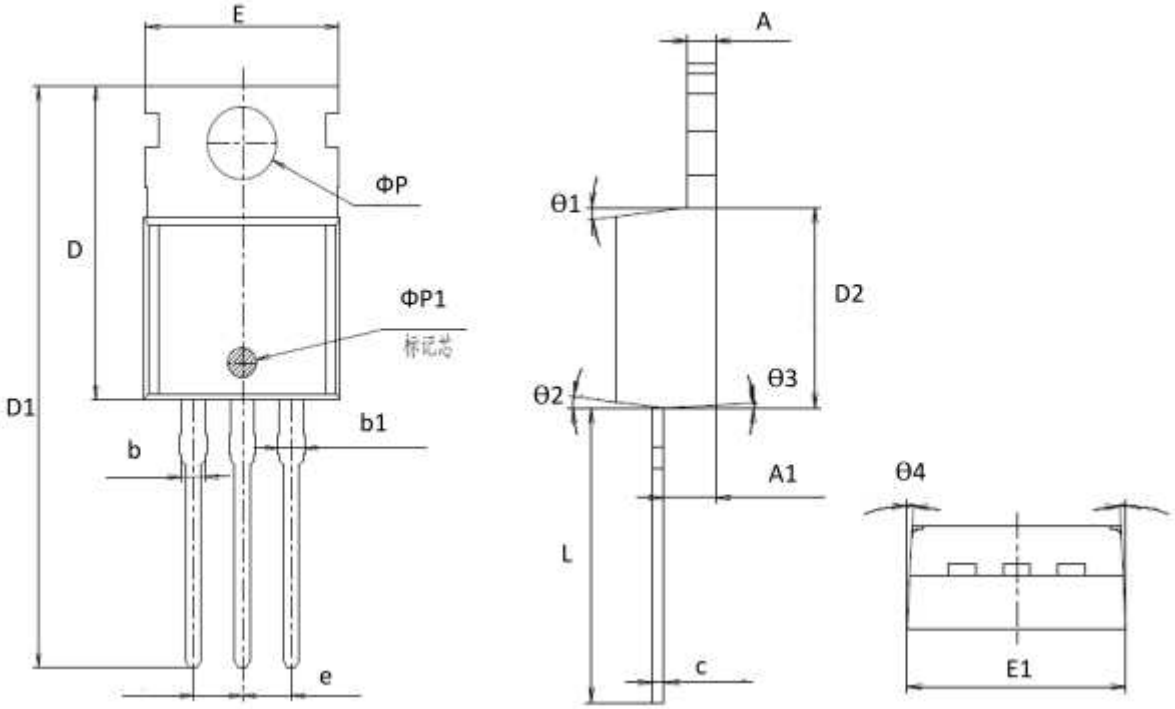
T：Tube

TO220＝A

Part Number	Package	Marking	Marking Information
EC736014AT	TO220		

Package Outline Dimension

TO220 PACKAGE OUTLINE DIMENSION_GN



Symbol	Dimension In Millimeters			Dimension In Inches		
	Min	Nom	Max	Min	Nom	Max
A	-	1.300	-	-	0.051	-
A1	2.200	2.400	2.600	0.087	0.094	0.102
b	-	1.270	-	-	0.050	-
b1	1.270	1.370	1.470	0.050	0.054	0.058
c	-	0.500	-	-	0.020	-
D	-	15.600	-	-	0.614	-
D1	-	28.700	-	-	1.130	-
D2	-	9.150	-	-	0.360	-
E	9.900	10.000	10.100	0.390	0.394	0.398
E1	-	10.160	-	-	0.400	-
ΦP	-	3.600	-	-	0.142	-
ΦP1		1.500			0.059	
e		2.54BSC			0.1BSC	
L	12.900	13.100	13.300	0.508	0.516	0.524
θ1	-	7^0	-	-	7^0	-
θ2	-	7^0	-	-	7^0	-
θ3	-	3^0	-	5^0	7^0	9^0
θ4	-	3^0	-	1^0	3^0	5^0