

600V, N-Channel MOSFET

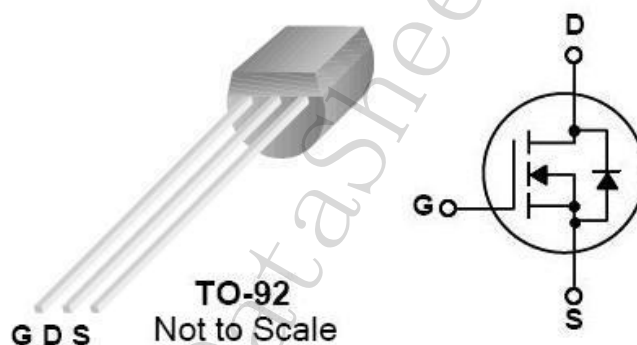
General Features

- Extremely high dv/dt capability
- Low Gate Charge
- ESD improved capability
- 100% avalanche tested
- New high voltage Benchmark

BV_{DSS}	$R_{DS(ON)}$ (Max.)	I_D
600V	8.2 Ω	1.0A

Applications:

- Low power battery chargers
- Switch mode low power Supplies (SMPS)
- Low Power Ballast CFL (Compact Fluorescent Lamps)



Ordering Codes

Part Number	Package	Marking
FTN01N60	TO-92	FTN01N60

Electrical Ratings

Absolute Maximum Ratings $T_C=25^\circ\text{C}$ unless otherwise specified

Symbol	Parameter	FTN01N60	Units
V_{DS}	Drain-to-Source Voltage (NOTE*1)	600	V
I_D	Continuous Drain Current	1.0	A
$I_{D@100^\circ\text{C}}$	Continuous Drain Current	0.6	
I_{DM}	Pulsed Drain Current, $V_{GS}@10\text{V}$ (NOTE*2)	4.0	
P_D	Power Dissipation	3	W
	Derating Factor above 25°C	0.025	W/ $^\circ\text{C}$
V_{GS}	Gate-to-Source Voltage	± 30	V
E_{AS}	Single Pulse Avalanche Energy $L=10\text{mH}$, $I_D=2.2\text{A}$	25	mJ
dv/dt	Peak Diode Recovery dv/dt (NOTE*3)	4.5	V/ns
T_L T_{PKG}	Maximum Temperature for Soldering Leads at 0.063 in (1.6mm) from Case for 10 seconds Package Body for 10 seconds	300 260	$^\circ\text{C}$
T_J and T_{STG}	Operating Junction and Storage Temperature Range	-55 to 150	

*Drain Current limited by Maximum Junction Temperature. Caution: Stresses greater than those listed in the "Absolute Maximum Ratings" Table may cause permanent damage to the device.

Thermal data

Symbol	Parameter	FTN01N60	Units	Test Conditions
$R_{\theta JC}$	Thermal resistance Junction-to-Case Max	--	$^{\circ}\text{C}/\text{W}$	Water cooled heat sink, P_D adjusted for a peak junction temperature of $+150^{\circ}\text{C}$
$R_{\theta JA}$	Thermal resistance Junction-to-Ambient Max	120		1 cubic foot chamber, free air.

Electrical Characteristics

OFF Characteristics $T_J = 25^{\circ}\text{C}$ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
BV_{DSS}	Drain-to-Source Breakdown Voltage	600	--	--	V	$V_{GS}=0\text{V}$, $I_D=250\mu\text{A}$
$\Delta BV_{DSS}/\Delta T_J$	Breakdown Voltage Temperature Coefficient	--	0.6	--	$\text{V}/^{\circ}\text{C}$	Reference to 25°C , $I_D=250\mu\text{A}$
I_{DSS}	Drain-to-Source Leakage Current	--	--	12	μA	$V_{DS}=600\text{V}$, $V_{GS}=0\text{V}$
		--	--	250		$V_{DS}=480\text{V}$, $V_{GS}=0\text{V}$, $T_J=125^{\circ}\text{C}$
I_{GSS}	Gate-to-Source Forward Leakage	--	--	100	nA	$V_{GS}=+30\text{V}$
		--	--	-100		$V_{GS}=-30\text{V}$

ON Characteristics $T_J = 25^{\circ}\text{C}$ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
$R_{DS(ON)}$	Static Drain-to-Source On-Resistance	--	7.2	8.2	Ω	$V_{GS}=10\text{V}$, $I_D=0.24\text{A}$ (NOTE*4)
$V_{GS(TH)}$	Gate Threshold Voltage	2.0	--	4.0	V	$V_{DS} = V_{GS}$, $I_D=250\mu\text{A}$
gfs	Forward Transconductance	--	1.0	--	S	$V_{DS} = 40\text{V}$, $I_D=0.24\text{A}$ (NOTE*4)

Dynamic Characteristics Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
C_{ISS}	Input Capacitance	--	--	--	pF	$V_{GS}=0\text{V}$ $V_{DS}=25\text{V}$ $f=1.0\text{MHz}$
C_{OSS}	Output Capacitance	--	--	--		
C_{ISS}	Reverse Transfer Capacitance	--	--	--		
Q_G	Total Gate Charge	--	--	--	nC	$V_{DD}=480\text{V}$ $I_D=0.4\text{A}$
Q_{GS}	Gate-to-Source Charge	--	--	--		
Q_{GD}	Gate-to-Drain (Miller) Charge	--	--	--		

Resistive Switching Characteristics Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
$t_{d(ON)}$	Turn-on Delay Time	--	--	--	ns	$V_{DD}=300V$ $I_D=0.24A$ $V_{GS}=10V$ $R_G=4.7\ \Omega$
t_{rise}	Rise Time	--	--	--		
$t_{d(OFF)}$	Turn-off Delay Time	--	--	--		
t_{fall}	Fall Time	--	--	--		

Source-Drian Diode Characteristics $T_J=25^\circ C$ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
I_{SD}	Continuous Source Current(Body Diode)	--	--	0.4	A	Integral pn-diode in MOSFET
I_{SM}	Maximum Pulsed Current(Body Diode)	--	--	1.6	A	
V_{SD}	Diode Forward Voltage	--	--	1.6	V	$I_S=0.4A, V_{GS}=0V$
t_{rr}	Reverse Recovery Time	--	--	--	ns	$V_{GS}=0V$ $I_F=0.4A, di/dt=100A/us$
Q_{rr}	Reverse Recovery Charge	--	--	--	nC	

NOTE:

- *1. $T_J=+25^\circ C$ to $+150^\circ C$
- *2. Repetitive rating; pulse width limited by maximum junction temperature.
- *3. $I_{SD}=4A$ $di/dt \leq 100A/\mu s$, $V_{DD} \leq BV_{DSS}$, $T_J=+150^\circ C$.
- *4. Pulse width $\leq 380\mu s$; duty cycle $\leq 2\%$.

Disclaimers:

ARK Microelectronics Co., Ltd. reserves the right to make change without notice in order to improve reliability, function or design and to discontinue any product or service without notice. Customers should obtain the latest relevant information before orders and should verify that such information is current and complete. All products are sold subject to ARK Microelectronics Co., Ltd's terms and conditions supplied at the time of order acknowledgement.

ARK Microelectronics Co., Ltd. warrants performance of its hardware products to the specifications at the time of sale. Testing, reliability and quality control are used to the extent ARK Microelectronics Co., Ltd deems necessary to support this warrantee. Except where agreed upon by contractual agreement, testing of all parameters of each product is not necessary performed.

ARK Microelectronics Co., Ltd. does not assume any liability arising from the use of any product or circuit designs described herein. Customers are responsible for their products and applications using ARK Microelectronics Co., Ltd's components. To minimize risk, customers must provide adequate design and operating safeguards.

ARK Microelectronics Co., Ltd. does not warrant or convey any license either expressed or implied under its patent rights, nor the rights of others. Reproduction of information in ARK Microelectronics Co., Ltd's data sheets or data books is permissible only if reproduction is without modification or alteration. Reproduction of this information with any alteration is an unfair and deceptive business practice. ARK Microelectronics Co., Ltd is not responsible or liable for such altered documentation.

Resale of ARK Microelectronics Co., Ltd's products with statements different from or beyond the parameters stated by ARK Microelectronics Co., Ltd. for the product or service voids all express or implied warranties for the associated ARK Microelectronics Co., Ltd's product or service and is unfair and deceptive business practice. ARK Microelectronics Co., Ltd is not responsible or liable for any such statements.

Life Support Policy:

ARK Microelectronics Co., Ltd's products are not authorized for use as critical components in life devices or systems without the expressed written approval of ARK Microelectronics Co., Ltd.

As used herein:

1. Life support devices or systems are devices or systems which:
 - a. are intended for surgical implant into the human body,
 - b. support or sustain life,
 - c. whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in significant injury to the user.
 2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.
-