

EVVOSEMI[®]

THINK CHANGE DO



ESD



TVS



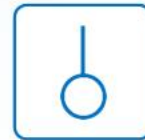
MOS



LDO



Diode



Sensor



DC-DC

Product Specification

▶ Domestic	Part Number	4N60F
▶ Overseas	Part Number	4N60F
▶ Equivalent	Part Number	4N60F

EV is the abbreviation of name EVVO

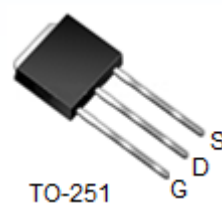
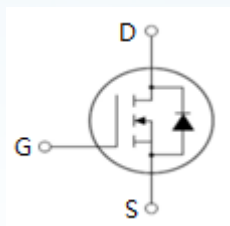
600V N-Channel Enhancement Mode MOSFET

FEATURES

- Fast switching
- 100% avalanche tested
- Improved dv/dt capability

APPLICATIONS

- Switch Mode Power Supply (SMPS)
- Uninterruptible Power Supply (UPS)
- Power Factor Correction (PFC)

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

Parameter	Symbol	Value				Unit
		TO-220F	TO-220	TO-251	TO-252	
Drain-Source Voltage ($V_{GS} = 0V$)	V_{DSS}	600				V
Continuous Drain Current	I_D	3				A
Pulsed Drain Current (note1)	I_{DM}	12				A
Gate-Source Voltage	V_{GSS}	± 30				V
Single Pulse Avalanche Energy (note2)	E_{AS}	90				mJ
Avalanche Current (note1)	I_{AR}	3				A
Repetitive Avalanche Energy (note1)	E_{AR}	10				mJ
Power Dissipation ($T_C = 25^{\circ}C$)	P_D	30	45			W
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55~+150				$^{\circ}C$

Thermal Resistance

Parameter	Symbol	Value				Unit
		TO-220F	TO-220	TO-251	TO-252	
Thermal Resistance, Junction-to-Case	R _{thJC}	4.1	2.8			°C/W
Thermal Resistance, Junction-to-Ambient	R _{thJA}	62.5	60			

600V N-Channel Enhancement Mode MOSFET

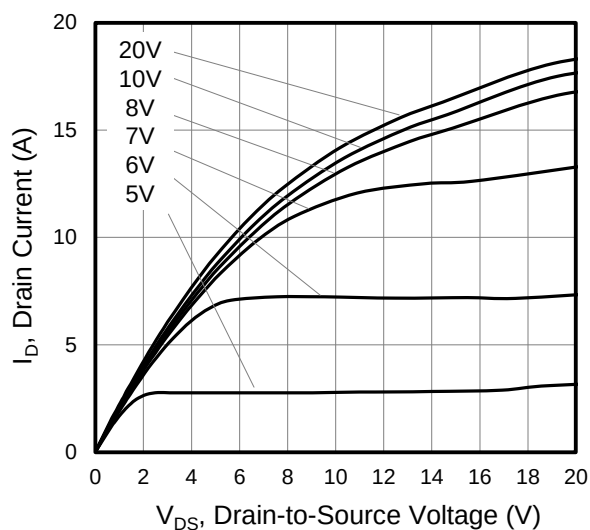
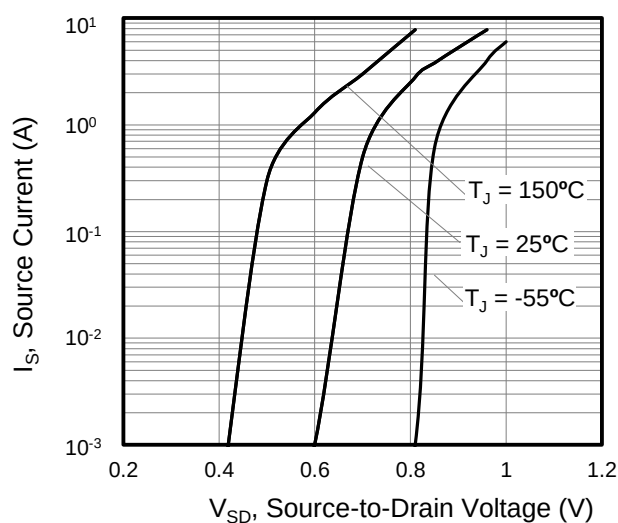
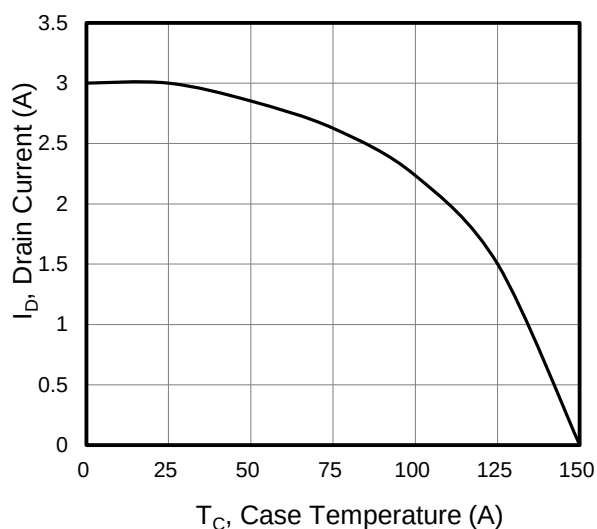
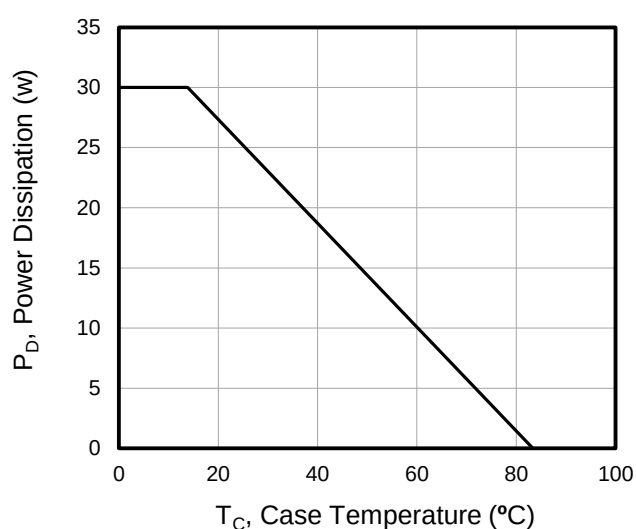
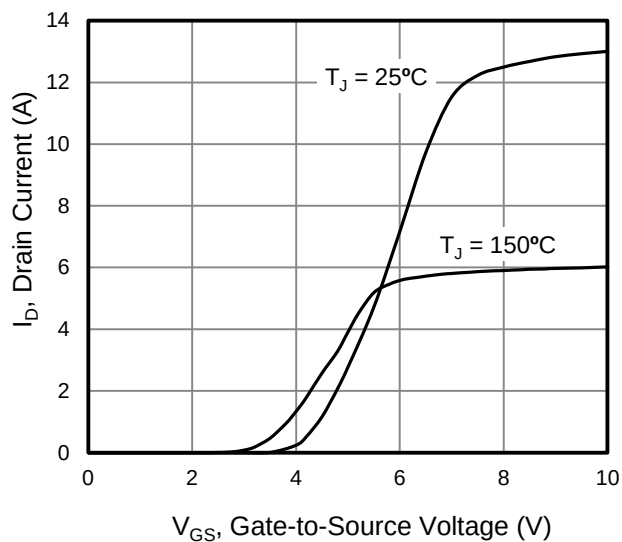
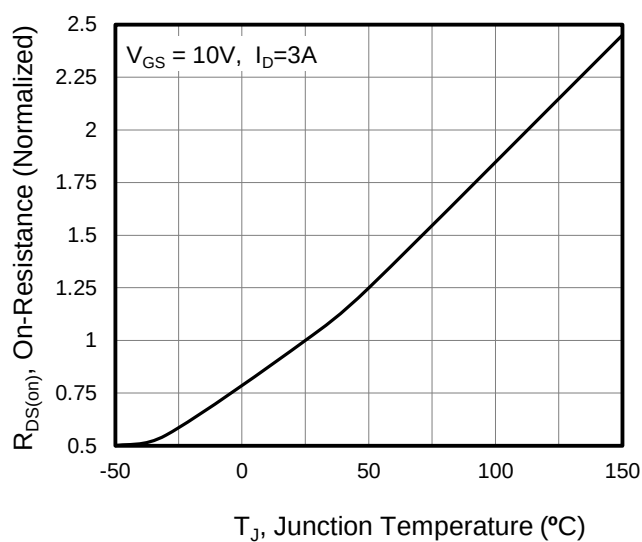
Specifications T _J = 25°C, unless otherwise noted						
Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
Static						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D = 250μA	600	--	--	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 600V, V _{GS} = 0V, T _J = 25°C	--	--	1	μA
Gate-Source Leakage	I _{GSS}	V _{GS} = ±30V	--	--	±100	nA
Gate-Source Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	3.0	--	4.0	V
Drain-Source On-Resistance (Note3)	R _{DS(on)}	V _{GS} = 10V, I _D = 1.5A	--	2.4	2.8	Ω
Dynamic						
Input Capacitance	C _{iss}	V _{GS} = 0V, V _{DS} = 25V, f = 1.0MHz	--	462	--	pF
Output Capacitance	C _{oss}		--	54.2	--	
Reverse Transfer Capacitance	C _{rss}		--	8.8	--	
Total Gate Charge	Q _g	V _{DD} = 480V, I _D = 3.0A, V _{GS} = 10V	--	13.5	--	nC
Gate-Source Charge	Q _{gs}		--	2	--	
Gate-Drain Charge	Q _{gd}		--	6	--	
Turn-on Delay Time	t _{d(on)}	V _{DD} = 300V, I _D = 3.0A, R _G = 25 Ω	--	10	--	ns
Turn-on Rise Time	t _r		--	25	--	
Turn-off Delay Time	t _{d(off)}		--	40	--	
Turn-off Fall Time	t _f		--	52	--	
Drain-Source Body Diode Characteristics						
Continuous Body Diode Current	I _S	T _C = 25 °C	--	--	3	A
Pulsed Diode Forward Current	I _{SM}		--	--	12	
Body Diode Voltage	V _{SD}	T _J = 25°C, I _{SD} = 3.0A, V _{GS} = 0V	--	--	1.4	V
Reverse Recovery Time	t _{rr}	V _{GS} = 0V, I _S = 3.0A, di _F /dt =100A /μs	--	220	--	ns
Reverse Recovery Charge	Q _{rr}		--	3	--	μC

Notes

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. $I_{AS} = 3A, V_{DD} = 50V, R_G = 25\Omega$, Starting $T_J = 25^\circ\text{C}$
3. Pulse Test: Pulse width $\leq 300\mu s$, Duty Cycle $\leq 1\%$

600V N-Channel Enhancement Mode MOSFET

Typical Characteristics $T_J = 25^\circ\text{C}$, unless otherwise noted

Figure 1. Output Characteristics ($T_J = 25^\circ\text{C}$)

Figure 2. Body Diode Forward Voltage

Figure 3. Drain Current vs. Temperature

Figure 4. Power Dissipation vs. Temperature

Figure 5. Transfer Characteristics

Figure 6. On-Resistance vs. Temperature


600V N-Channel Enhancement Mode MOSFET

Typical Characteristics $T_j = 25^\circ\text{C}$, unless otherwise noted

Figure 7. Capacitance

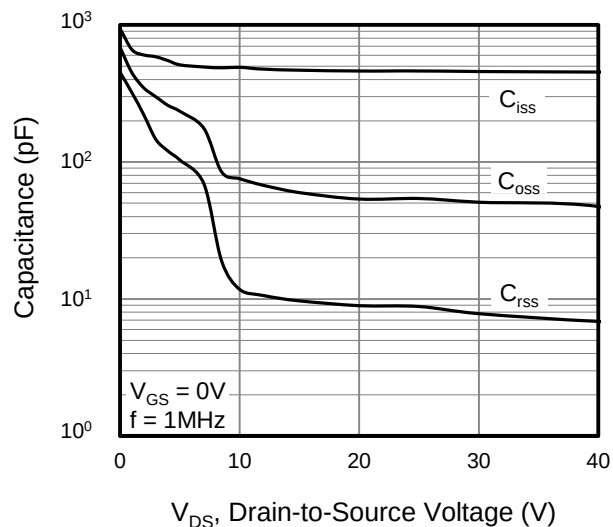
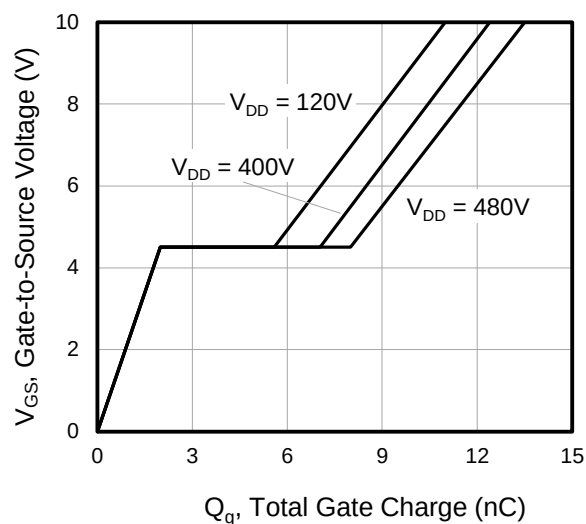
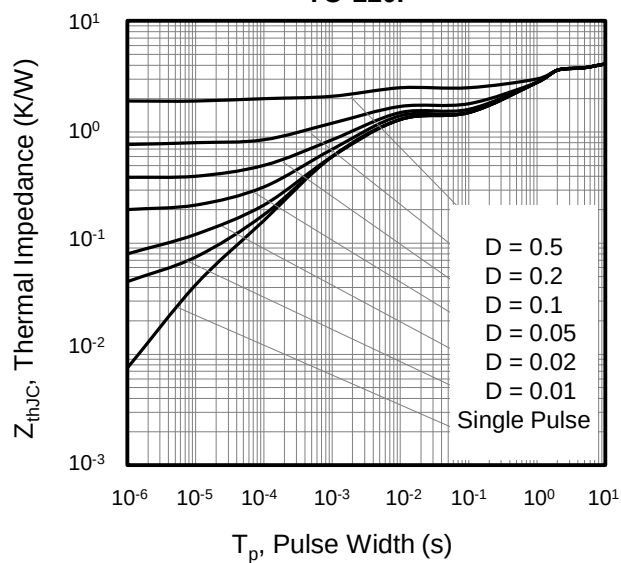


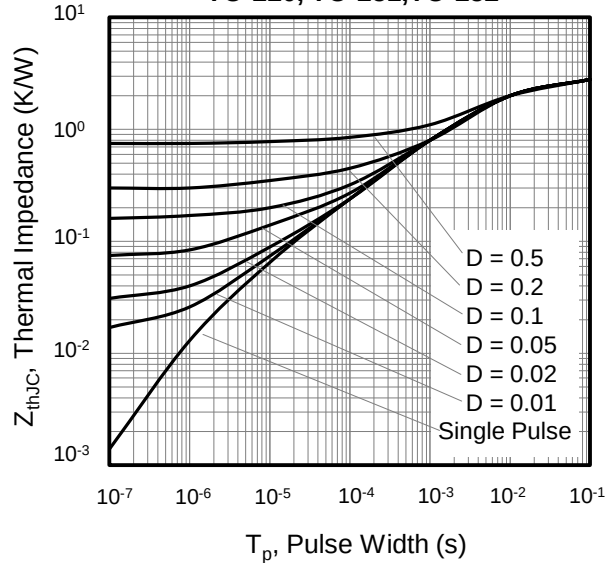
Figure 8. Gate Charge



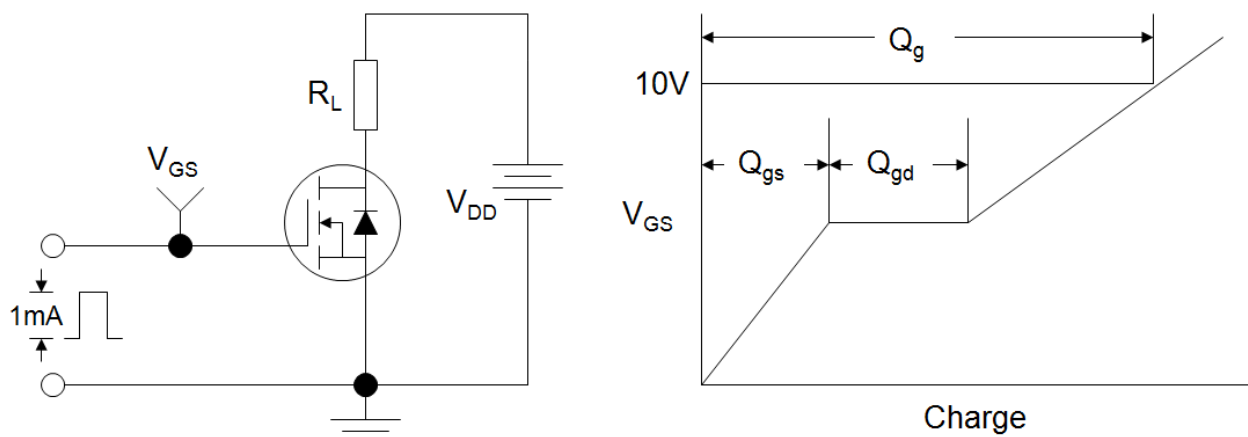
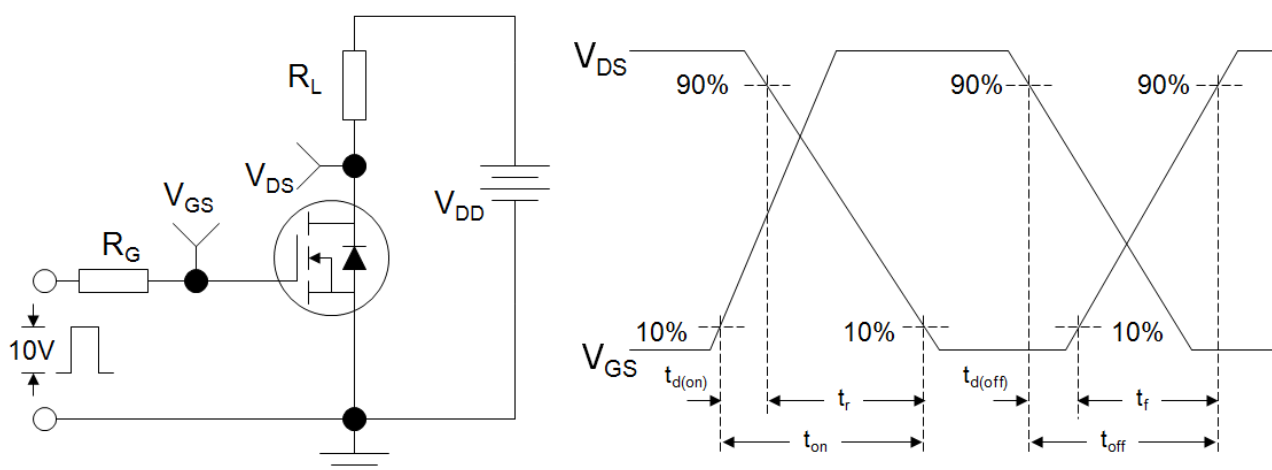
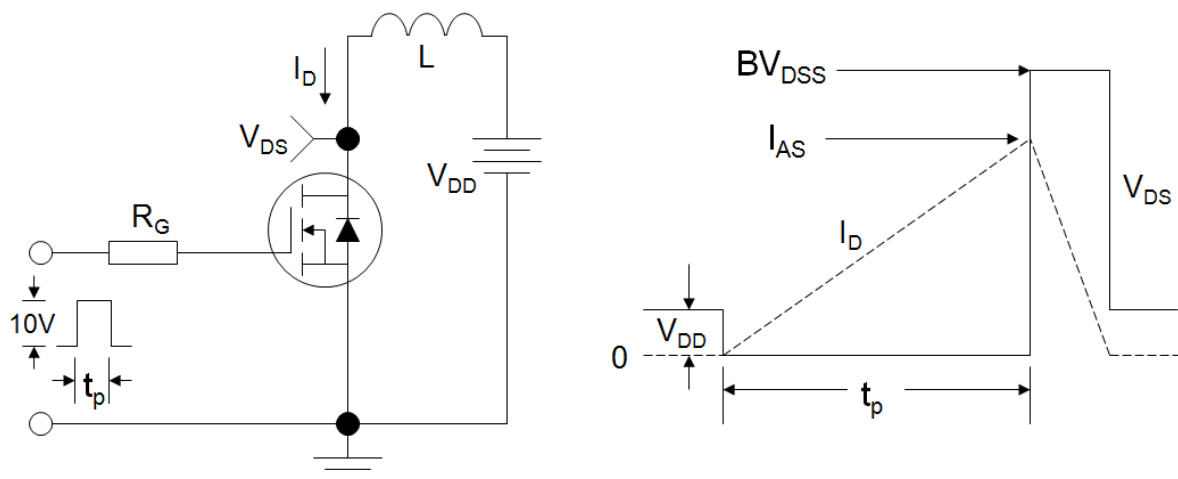
**Figure 9. Transient Thermal Impedance
TO-220F**



**Figure 10. Transient Thermal Impedance
TO-220, TO-251, TO-252**

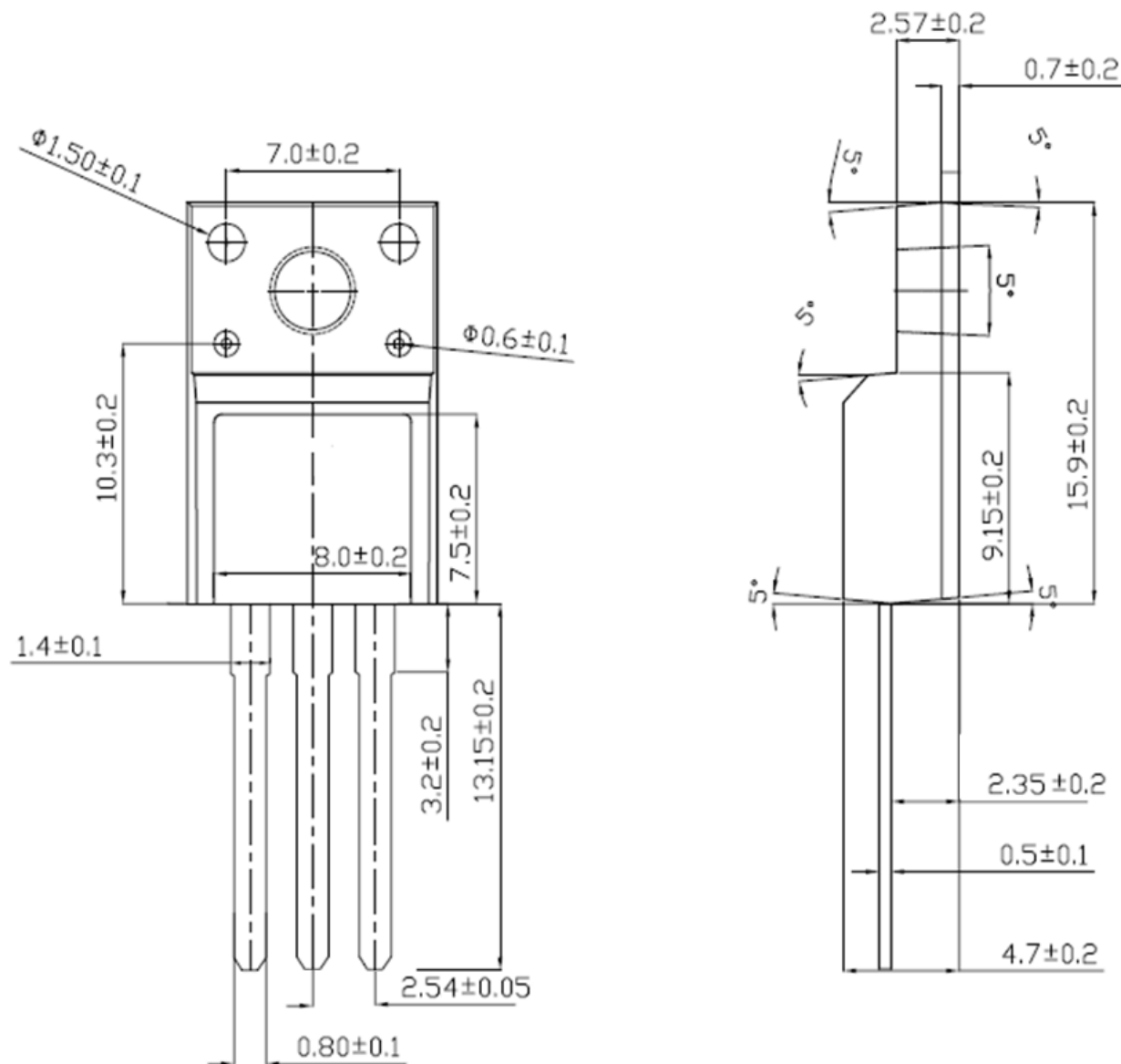


600V N-Channel Enhancement Mode MOSFET

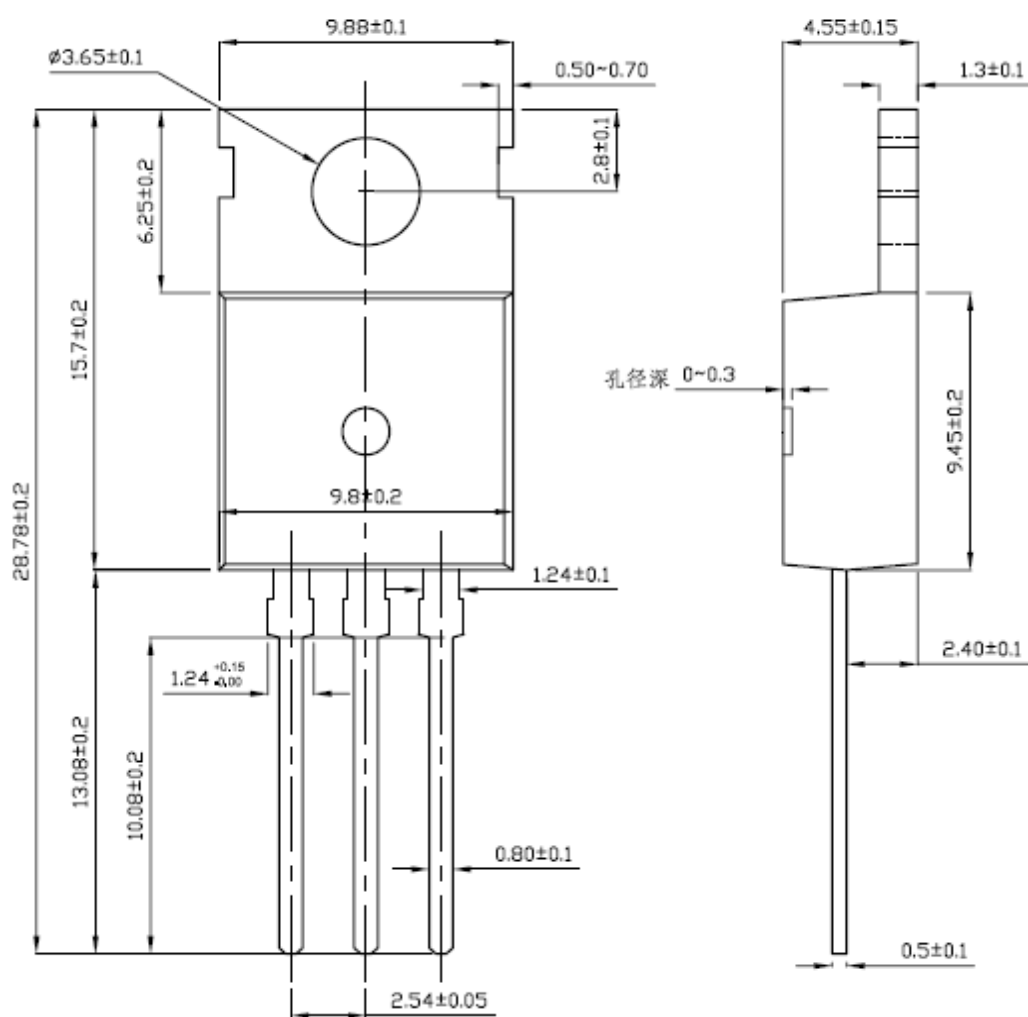
Figure A: Gate Charge Test Circuit and Waveform**Figure B: Resistive Switching Test Circuit and Waveform****Figure C: Unclamped Inductive Switching Test Circuit and Waveform**

600V N-Channel Enhancement Mode MOSFET

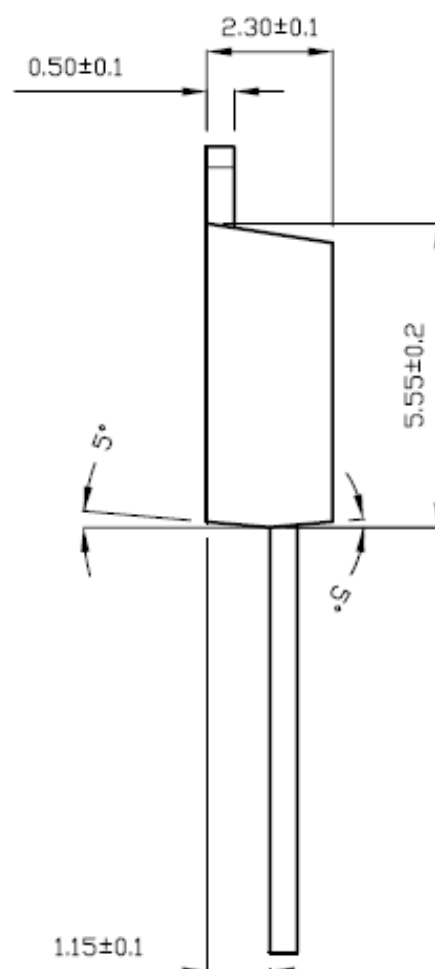
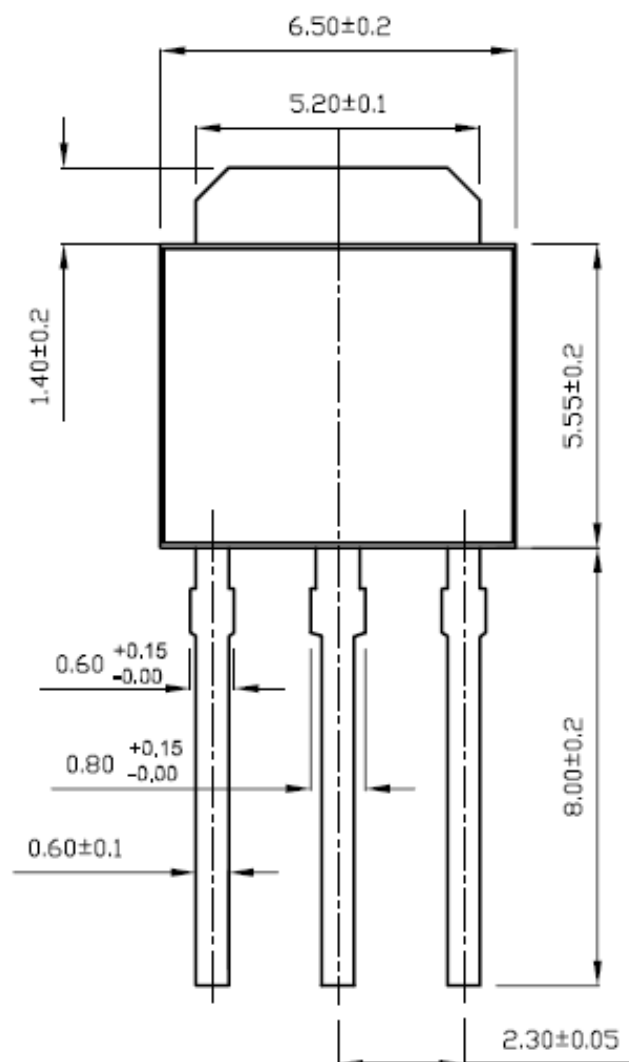
TO-220F



TO-220

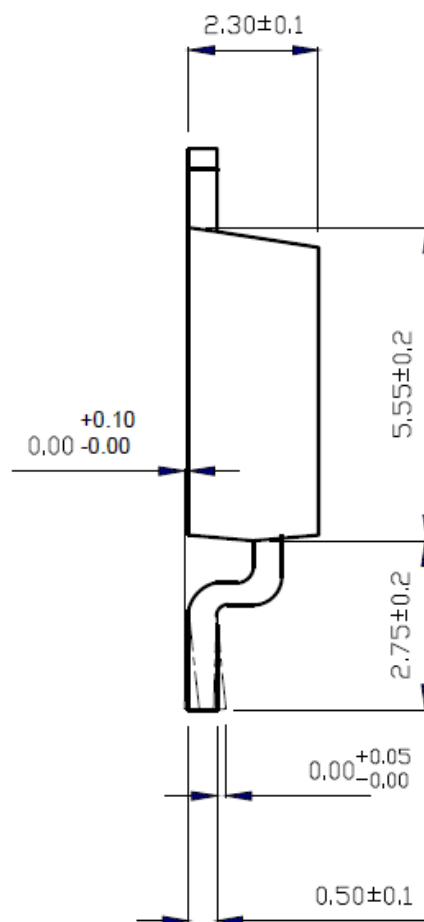
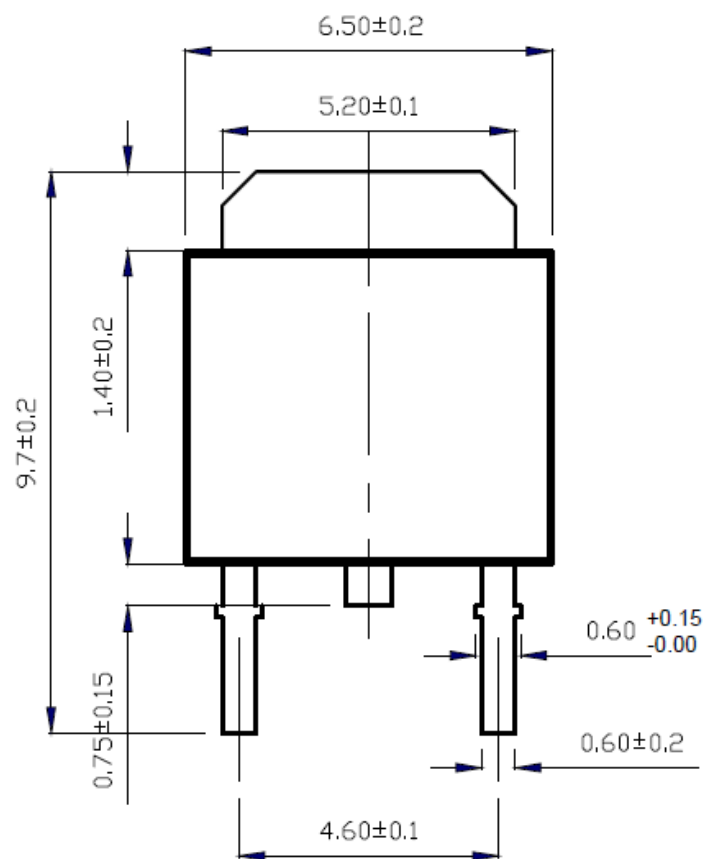


TO-251



600V N-Channel Enhancement Mode MOSFET

TO-252



Disclaimer

EVVOSEMI ("EVVO") reserves the right to make corrections, enhancements, improvements, and other changes to its products and services at any time, and to discontinue any product or service without notice.

EVVO warrants the performance of its hardware products to the specifications applicable at the time of sale in accordance with its standard warranty. Testing and other quality control techniques are used as deemed necessary by EVVO to support this warranty. Except where mandated by government requirements, testing of all parameters of each product is not necessarily performed.

Customers should obtain and confirm the latest product information and specifications before final design, purchase, or use. EVVO makes no warranty, representation, or guarantee regarding the suitability of its products for any particular purpose, nor does EVVO assume any liability for application assistance or customer product design. EVVO does not warrant or accept any liability for products that are purchased or used for any unintended or unauthorized application.

EVVO products are not authorized for use as critical components in life support devices or systems without the express written approval of EVVOSEMI.

The EVVO logo and EVVOSEMI are trademarks of EVVOSEMI or its subsidiaries in relevant jurisdictions. EVVO reserves the right to make changes without further notice to any products herein.