



MOT60R380F/MOT60R380A N-CHANNEL MOSFET

■ PRODUCT CHARACTERISTICS

VDSS	600V
$R_{DS(on)max}(@V_{GS}=10\text{ V})$	0.38Ω
Qg@type	14nC
ID	11A

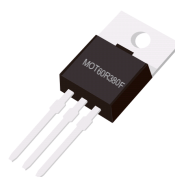
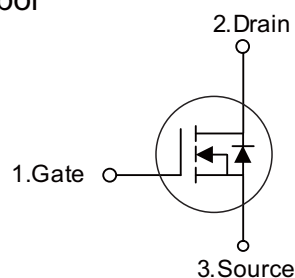
■ APPLICATIONS

- * Power factor correction
- * Switched mode power supplies
- * Uninterruptible power supply

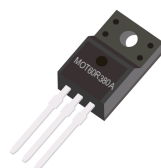
■ FEATURES

- * low $R_{DS(on)}$
- * low gate charge
- * 100% UIS tested
- * RoHS compliant

Symbol



TO-220



TO-220F

■ ORDER INFORMATION

Order codes		Package	Packing
Halogen-Free	Halogen		
N/A	MOT60R380F	TO-220F	50 pieces/Tube
N/A	MOT60R380A	TO-220	50 pieces/Tube

■ ABSOLUTE MAXIMUM RATINGS ($T_C=25^\circ\text{C}$ unless otherwise specified)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V _{DSS}	600	V
Continuous drain current	(T _C = 25°C)	I _D	11	A
	(T _C = 100°C)		8.2	A
Pulsed drain current ¹⁾		I _{DM}	30	A
Gate-Source voltage		V _{GSS}	±30	V
Avalanche energy, single pulse ²⁾		E _{AS}	245	mJ
Avalanche current, repetitive ³⁾		I _{AR}	11	A
Power Dissipation TO-220		P _D	90	W
(TC = 25°C) - Derate above 25°C			0.72	W/°C
Power Dissipation	TO-220F(T _C = 25°C)		31.8	W
	- Derate above 25°C		0.26	W/°C
Operating and Storage Temperature Range		T _J , T _{STG}	-55 to +150	°C
Continuous diode forward current		I _S	11	A
Diode pulse current		I _{S,pulse}	30	A

■ THERMAL CHARACTERISTICS

Parameter		Symbol	Value	Unit
Thermal Resistance, Junction-to-Case	TO-220	$R_{\theta JC}$	1.39	$^\circ\text{C/W}$
	TO-220F		3.9	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Ambient	TO-220	$R_{\theta JA}$	45	$^\circ\text{C/W}$
	TO-220F		53	$^\circ\text{C/W}$



MOT60R380F/MOT60R380A N-CHANNEL MOSFET

■ ELECTRICAL CHARACTERISTICS ($T_J = 25^\circ\text{C}$, unless otherwise specified)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static characteristics						
Drain-source breakdown voltage	BV _{DSS}	V _{GS} =0 V, I _D =0.25 mA	600	-	-	V
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =0.25mA	2.5	3.5	4.5	V
Drain cut-off current	I _{DSS}	V _{DS} =600 V, V _{GS} =0 V, T _j = 25°C			1	μA
		T _j = 125°C	-	10		
Gate leakage current, Forward	I _{GSSF}	V _{GS} =30 V, V _{DS} =0 V	-	-	100	nA
Gate leakage current, Reverse	I _{GSSR}	V _{GS} =-30 V, V _{DS} =0 V	-	-	-100	nA
Drain-source on-state resistance	R _{DS(on)}	V _{GS} =10 V, I _D =5.5 A T _j = 25°C	-	0.33	0.38	Ω
		T _j = 150°C	-	0.9	-	
Gate resistance	R _G	f=1 MHz, open drain	-	5.7	-	Ω
Dynamic characteristics						
Input capacitance	C _{iss}	V _{DS} = 25 V, V _{GS} = 0 V, f = 1 MHz	-	560	-	pF
Output capacitance	C _{oss}		-	216	-	
Reverse transfer capacitance	C _{rss}		-	1.2	-	
Turn-on delay time	t _{d(on)}	V _{DD} = 400V, I _D = 5.5A R _G = 10Ω, V _{GS} =15V	-	20.6	-	ns
Rise time	t _r		-	32	-	
Turn-off delay time	t _{d(off)}		-	62	-	
Fall time	t _f		-	12.5	-	
Gate charge characteristics						
Gate to source charge	Q _{gs}	V _{DD} =400 V, I _D =5.5A, V _{GS} =0 to 10 V	-	4.8	-	nC
Gate to drain charge	Q _{gd}		-	4.7	-	
Gate charge total	Q _g		-	14.7	-	
Gate plateau voltage	V _{plateau}		-	6	-	V
Reverse diode characteristics						
Diode forward voltage	V _{SD}	V _{GS} =0 V, I _F =5.5A	-	1.2	-	V
Reverse recovery time	t _{rr}	V _R =400 V, I _F =5.5A, dI _F /dt=100 A/μs	-	234	-	ns
Reverse recovery charge	Q _{rr}		-	4.4	-	μC
Peak reverse recovery current	I _{rrm}		-	18.7	-	A

Notes:

- Limited by maximum junction temperature, maximum duty cycle is 0.75.
- $I_{AS} = 3\text{ A}$, $V_{DD} = 60\text{ V}$, Starting $T_J = 25^\circ\text{C}$.
- Repetitive Rating: Pulse width limited by maximum junction temperature.



■ ELECTRICAL CHARACTERISTICS DIAGRAMS

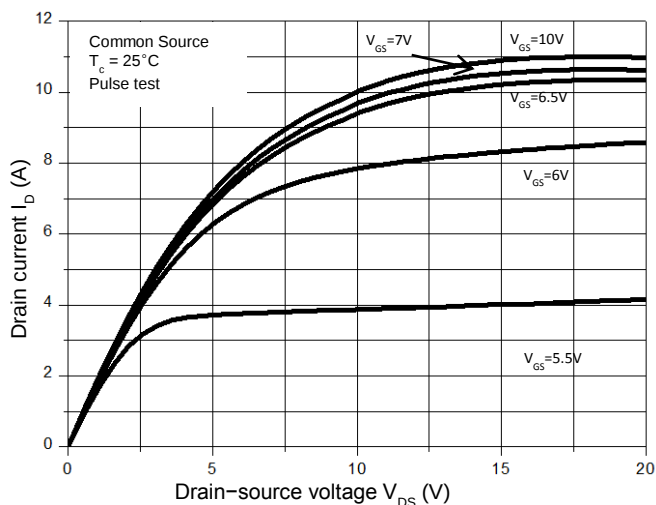


Figure 1. On-Region Characteristics

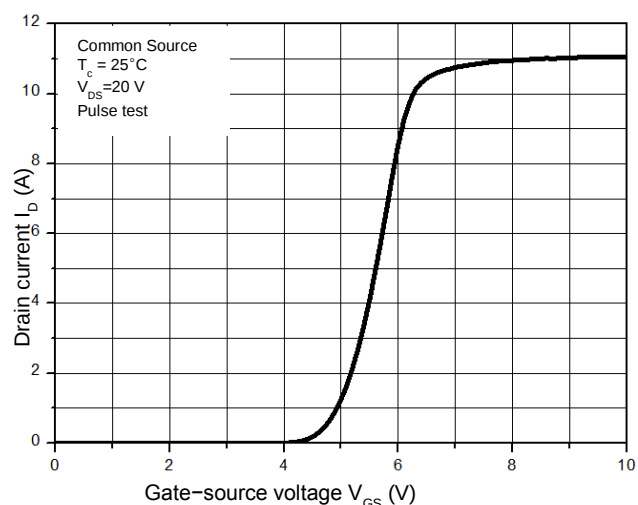


Figure 2. Transfer Characteristics

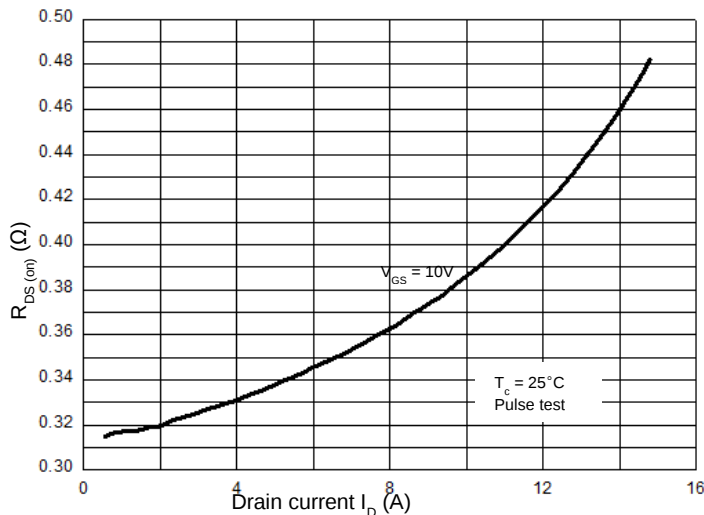


Figure 3. On-Resistance Variation vs. Drain Current

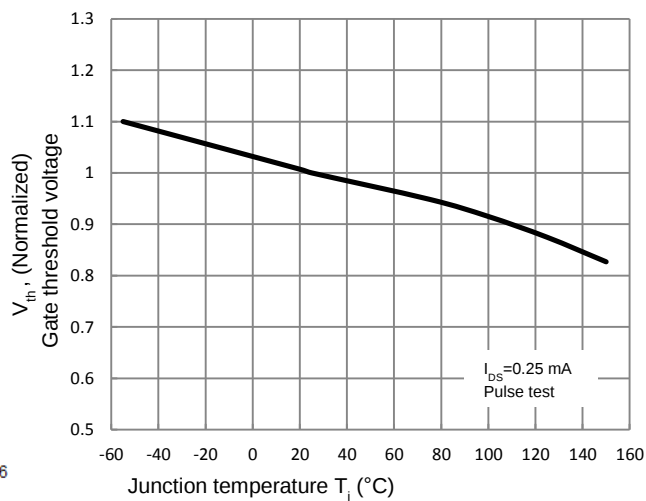


Figure 4. Threshold Voltage vs. Temperature

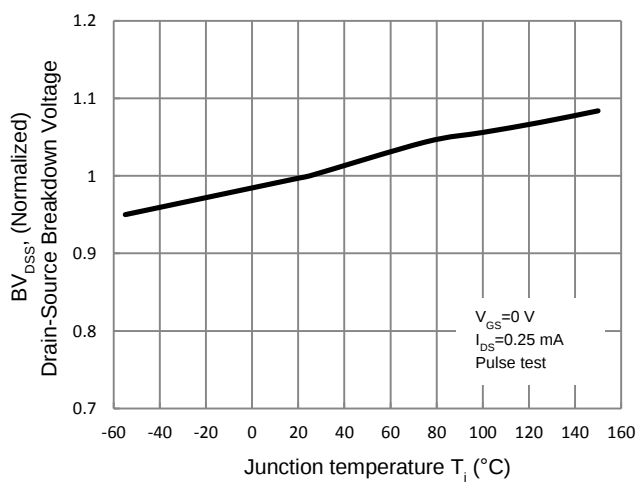


Figure 5. Breakdown Voltage vs. Temperature

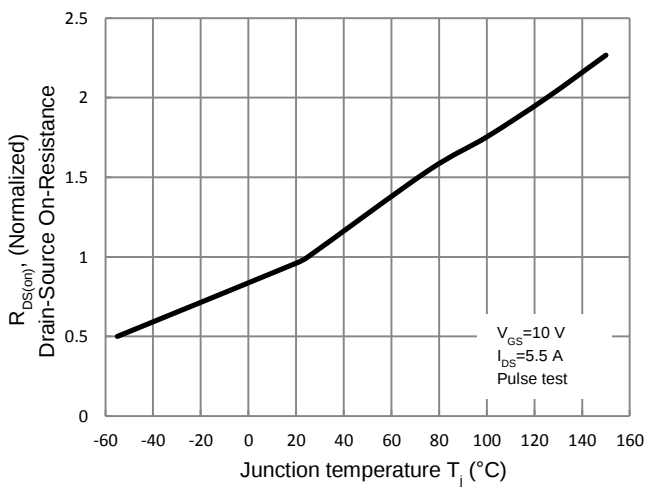


Figure 6. On-Resistance vs. Temperature



MOT60R380F/MOT60R380A N-CHANNEL MOSFET

■ ELECTRICAL CHARACTERISTICS DIAGRAMS(Cont.)

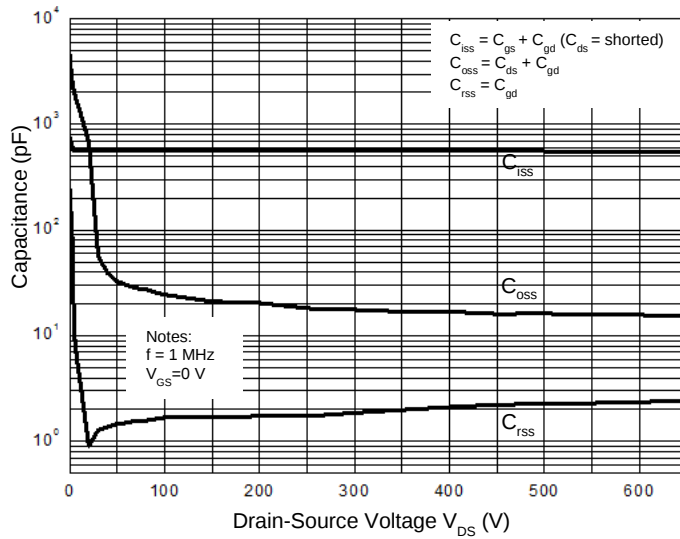


Figure 7. Capacitance Characteristics

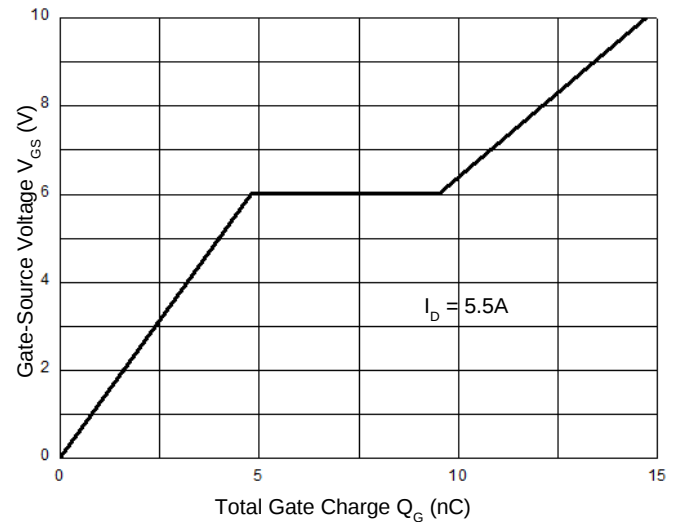


Figure 8. Gate Charge Characteristic

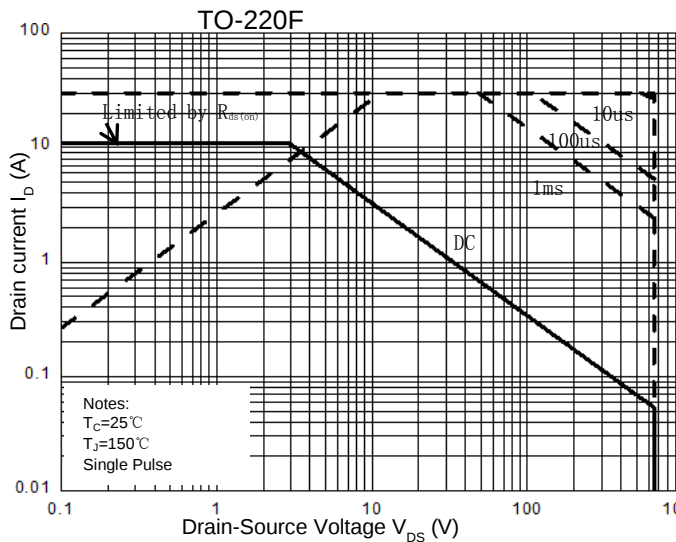


Figure 9.1 Maximum Safe Operating Area

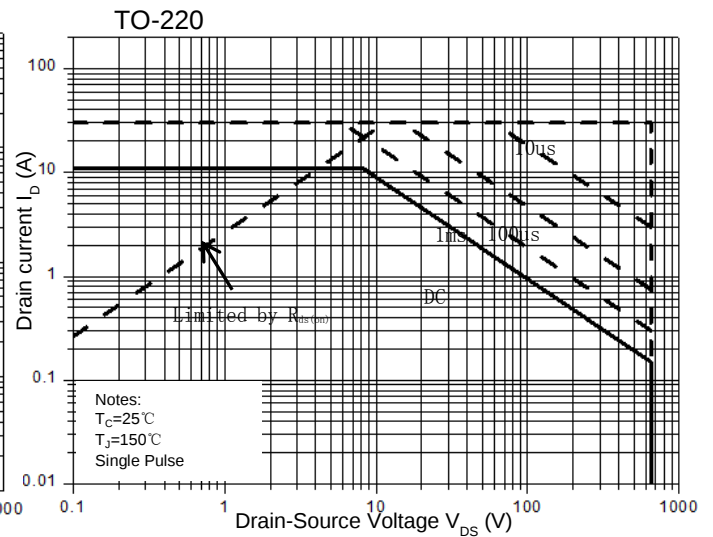


Figure 9.2 Maximum Safe Operating Area

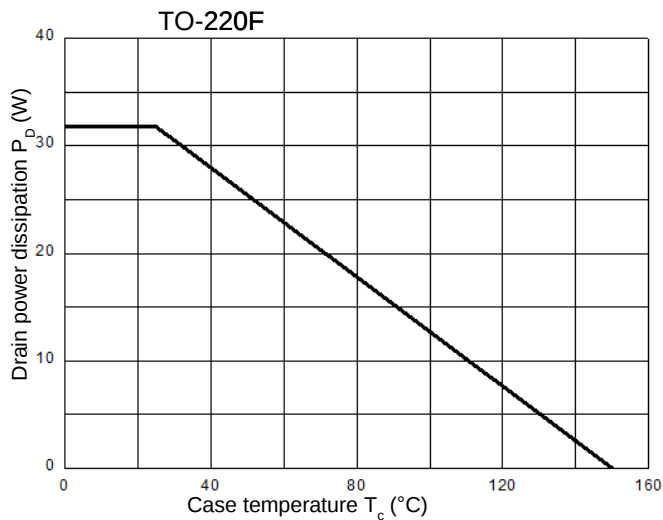


Figure 10.1 Power Dissipation vs. Temperature

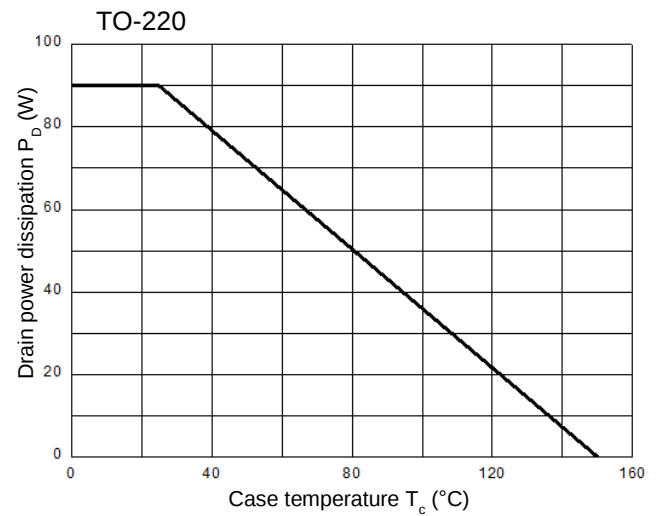
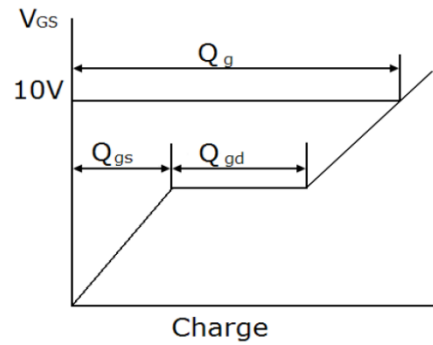
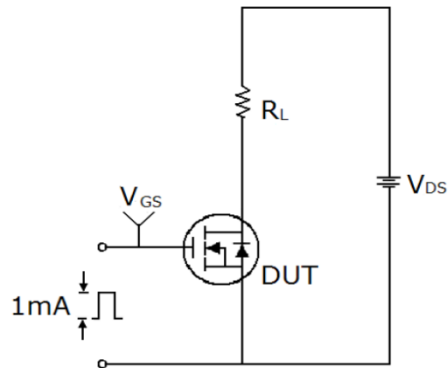
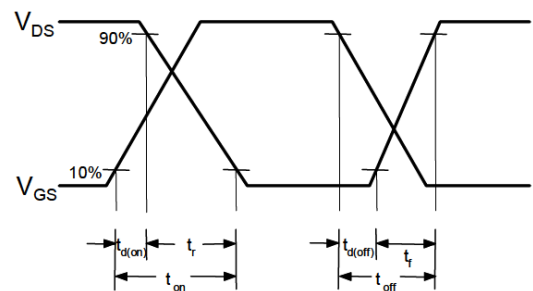
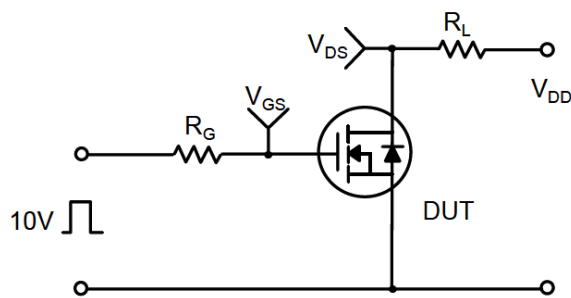


Figure 10.2 Power Dissipation vs. Temperature

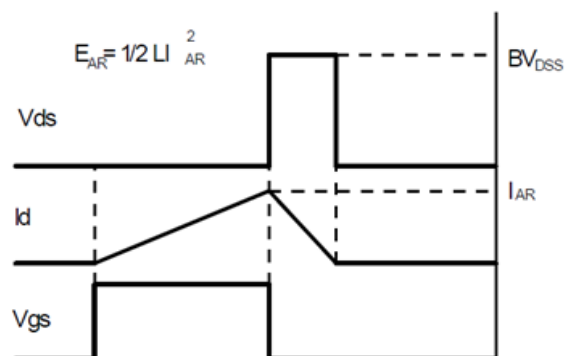
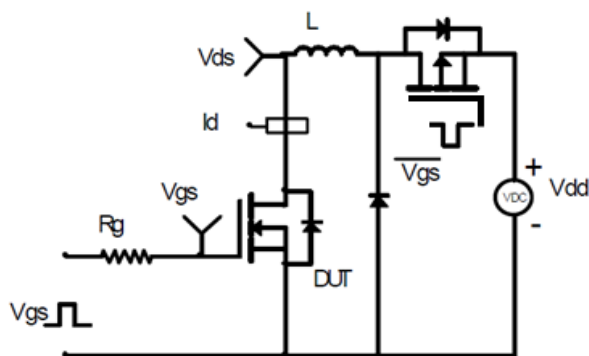
■ TEST CIRCUITS AND WAVEFORMS



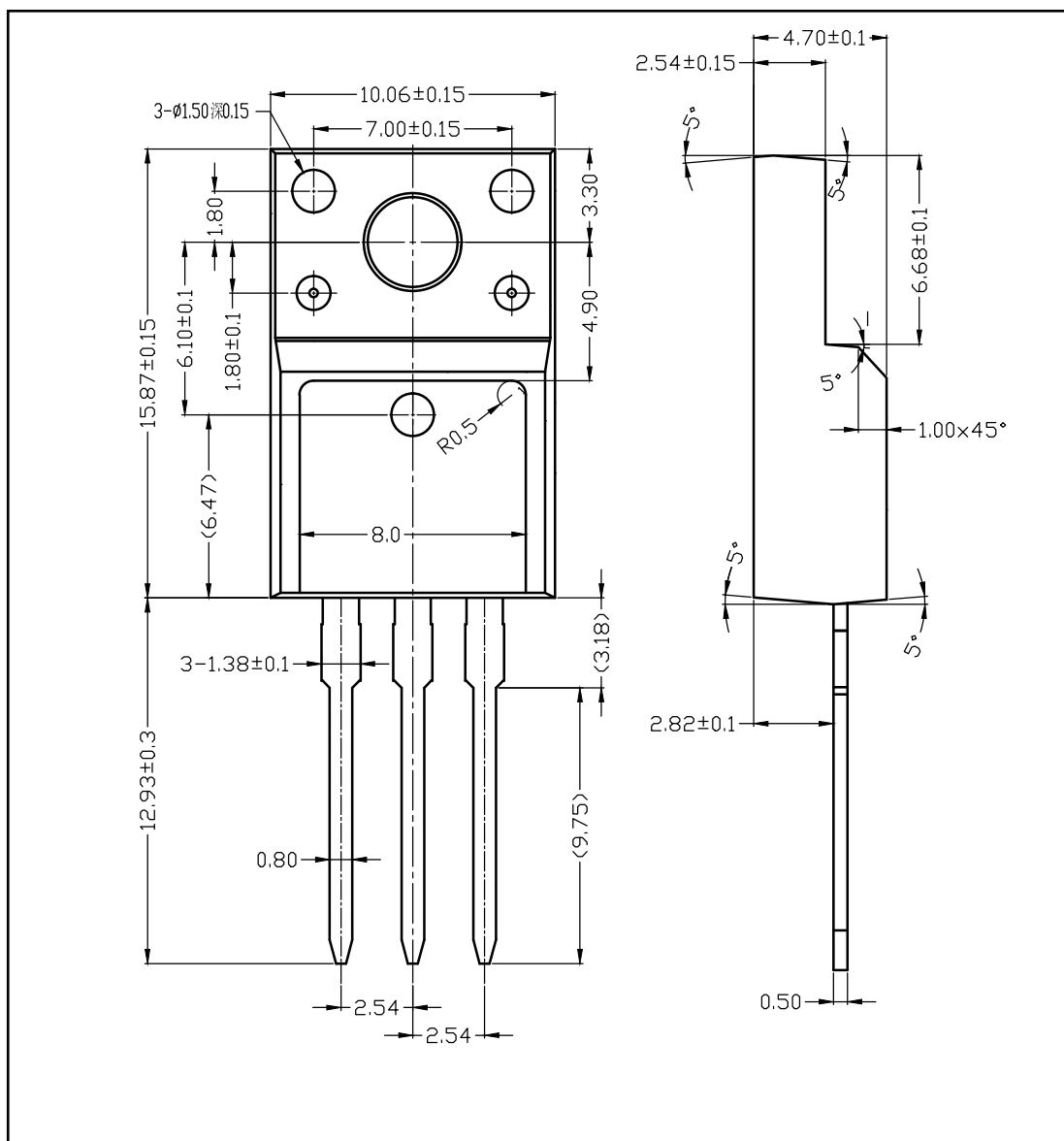
Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms



■ TO-220F-3L PACKAGE OUTLINE DIMENSIONS



■ TO-220-3L PACKAGE OUTLINE DIMENSIONS

