



UF450

Power MOSFET

12 Amps, 500 Volts N-CHANNEL POWER MOSFET

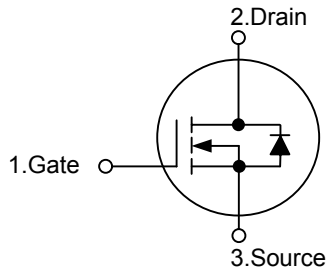
DESCRIPTION

The **UF450** uses advanced UTC technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with low gate voltages. This device is suitable for use as a load switch, in PWM applications, motor controls, inverters, choppers, audio amplifiers and high energy pulse circuits.

FEATURES

- * $R_{DS(ON)} = 0.4\Omega @ V_{GS} = 10V$
- * Ultra low gate charge (max. 120nC)
- * Low reverse transfer capacitance ($C_{RSS} = \text{typical } 240\text{pF}$)
- * Fast switching capability
- * Avalanche energy specified
- * Improved dv/dt capability

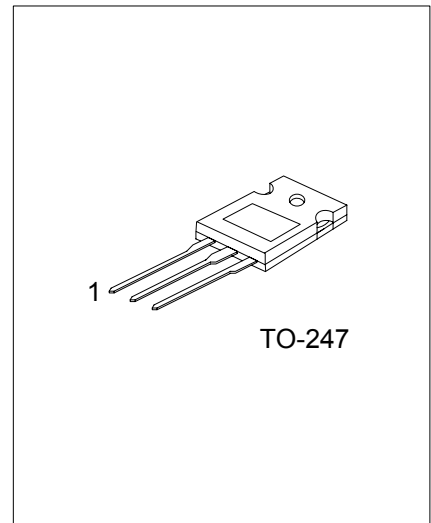
SYMBOL



ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Normal	Lead Free Plating		1	2	3	
UF450-T47-T	UF450L-T47-T	TO-247	G	D	S	Tube

<p>UF450L-T47-T</p> <p>(1)Packing Type</p> <p>(2)Package Type</p> <p>(3)Lead Plating</p>	<p>(1) T: Tube</p> <p>(2) T47: TO-247</p> <p>(3) L: Lead Free Plating, Blank: Pb/Sn</p>
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*Pb-free plating product number: UF450L

■ ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATINGS	UNIT
Gate-to-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	12	A
Pulsed Drain Current (Note 1)	I_{DM}	48	A
Avalanche Current	I_{AR}	12	A
Single Pulse Avalanche Energy (Note 2)	E_{AS}	8.0	mJ
Power Dissipation ($T_C=25^\circ$)	P_D	190	W
Peak Diode Recovery dv/dt (Note 2)	dv/dt	3.5	V/ns
Junction Temperature	T_J	+150	
Storage Temperature	T_{STG}	-55 ~ +150	

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ THERMAL DATA

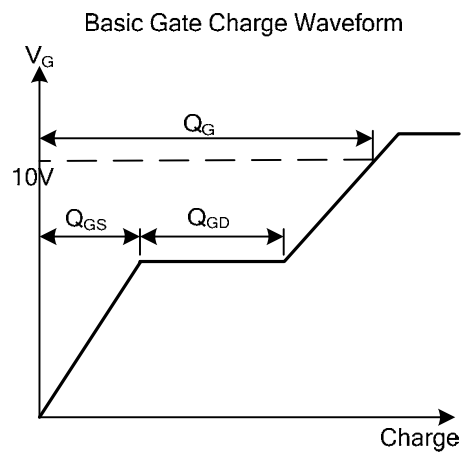
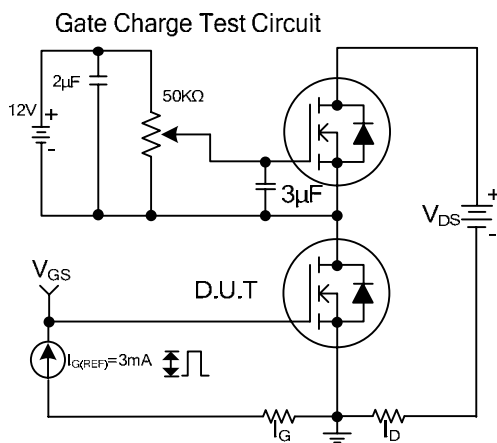
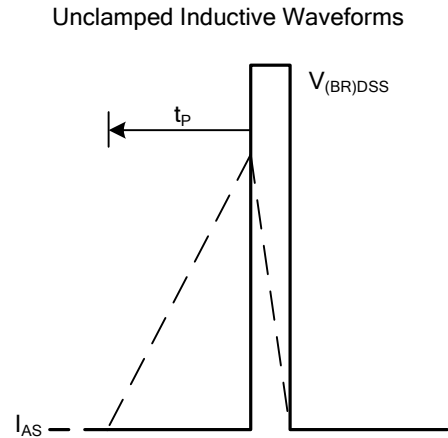
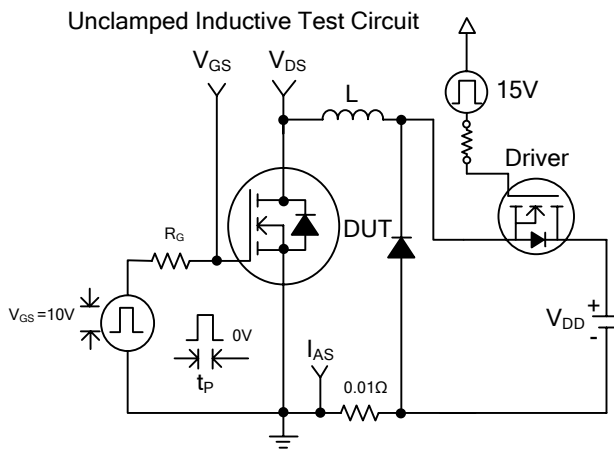
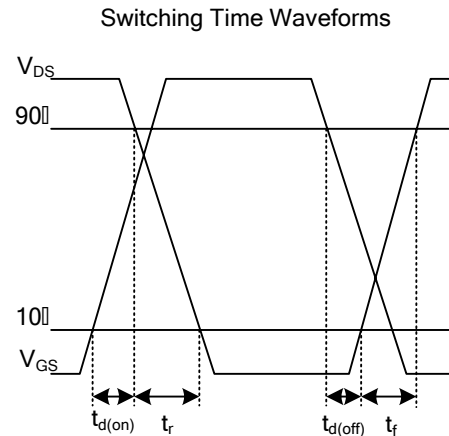
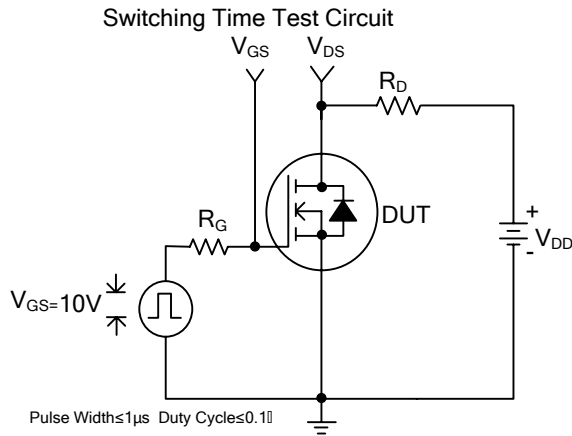
PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Junction-to- Ambient	θ_{JA}			30	/W
Junction-to-Case	θ_{JC}			0.83	/W

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

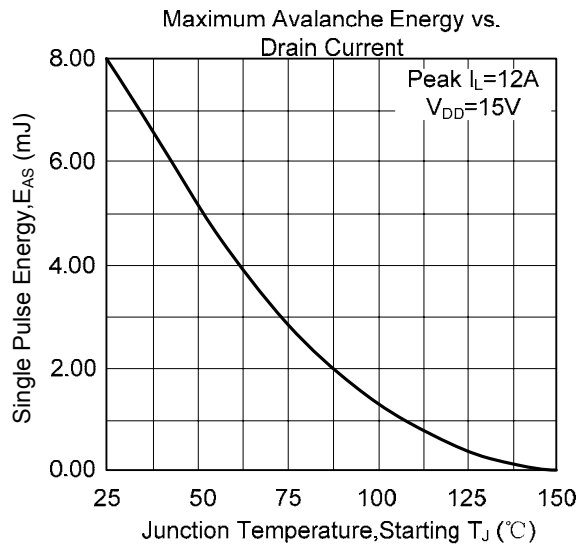
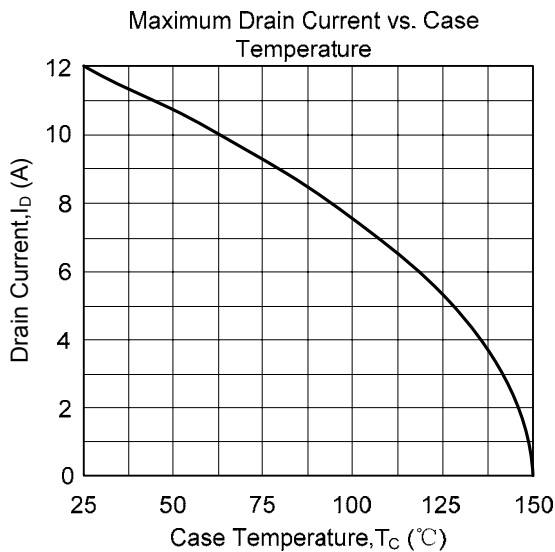
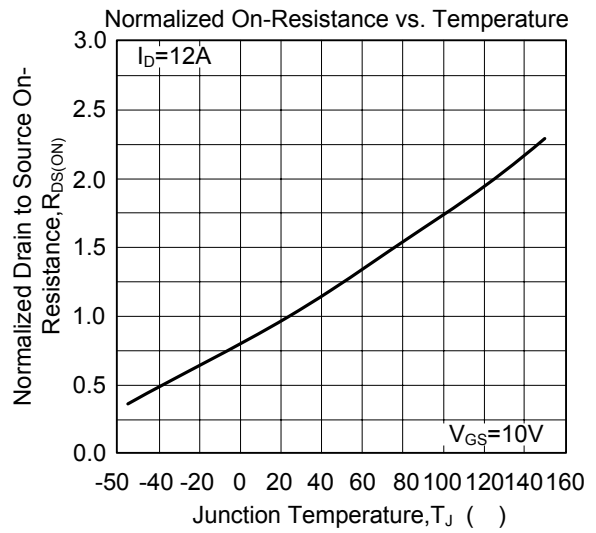
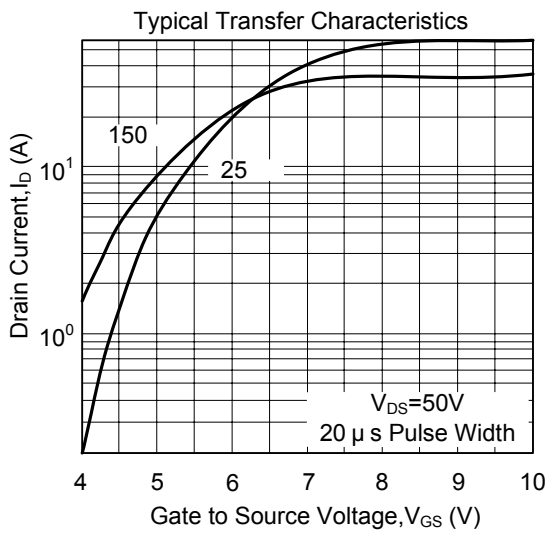
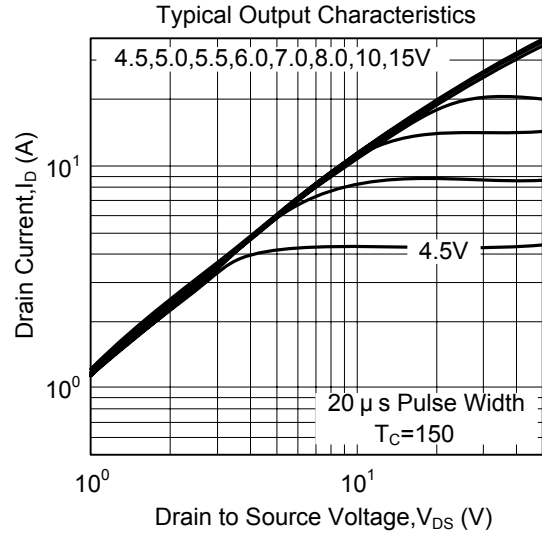
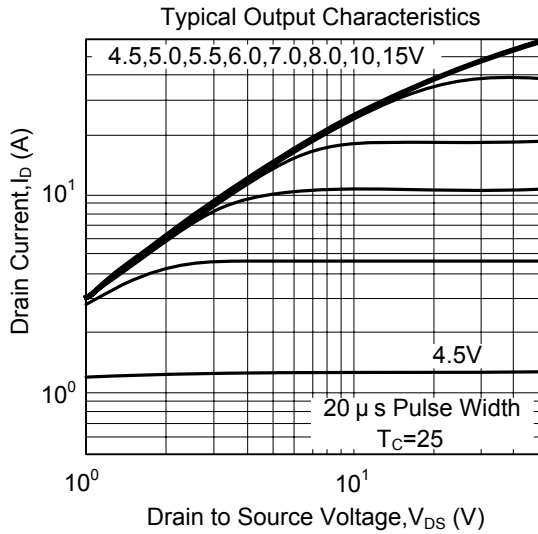
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=1.0mA$	500			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=400V, V_{GS}=0V$			25	μA
Gate-Source Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$			± 100	nA
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to $25^\circ, I_D=1.0mA$		0.78		V/
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0		4.0	V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=7.75A$			400	m Ω
		$V_{GS}=10V, I_D=12A$			500	
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	$V_{DS}=25V, V_{GS}=0V,$ $f=1.0MHz$		2700		pF
Output Capacitance	C_{OSS}			600		
Reverse Transfer Capacitance	C_{RSS}			240		
SWITCHING PARAMETERS						
Total Gate Charge	Q_G	$V_{DS}=250V, V_{GS}=10V,$ $I_D=12A$	55		120	nC
Gate Source Charge	Q_{GS}		5.0		19	
Gate Drain Charge	Q_{GD}		27		70	
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DD}=250V, I_D=12A,$ $R_G=2.35\Omega$			35	ns
Turn-ON Rise Time	t_R				190	
Turn-OFF Delay Time	$t_{D(OFF)}$				170	
Turn-OFF Fall-Time	t_F				130	
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage	V_{SD}	$I_S=12A, V_{GS}=0V, T_J=25^\circ$			1.7	V
Maximum Continuous Drain-Source Diode Forward Current	I_S				12	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}				48	
Reverse Recovery Time	t_{RR}	$I_F=12A, di/dt \leq 100A/\mu s,$			1600	ns
Reverse Recovery Charge	Q_{RR}	$T_J=25^\circ, V_{DD} \leq 50V$ (Note3)			14	μc

- Notes:
1. Repetitive Rating : Pulse width limited by T_J
 2. $V_{DD} = 50V$, starting $T_J = 25^\circ$, Peak $I_L = 12A$, $I_{SD} \leq 12$, $di/dt \leq 130A/\mu s, V_{DD} \leq 500V$, $T_J \leq 150^\circ$ Suggested $R_G = 2.35\Omega$
 3. Pulse Test: Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$
 4. Essentially independent of operating temperature

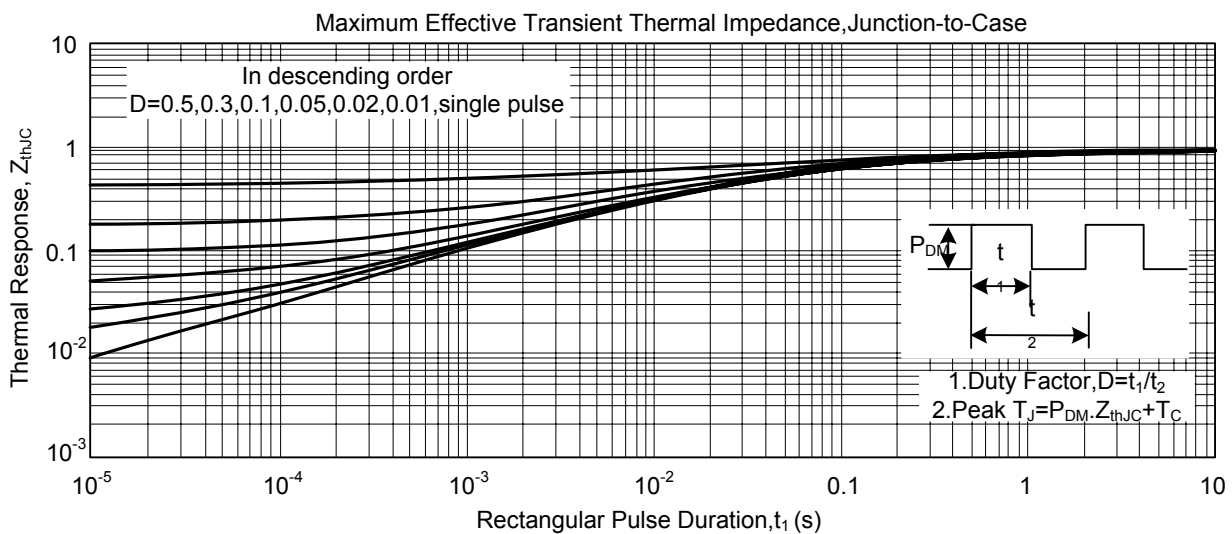
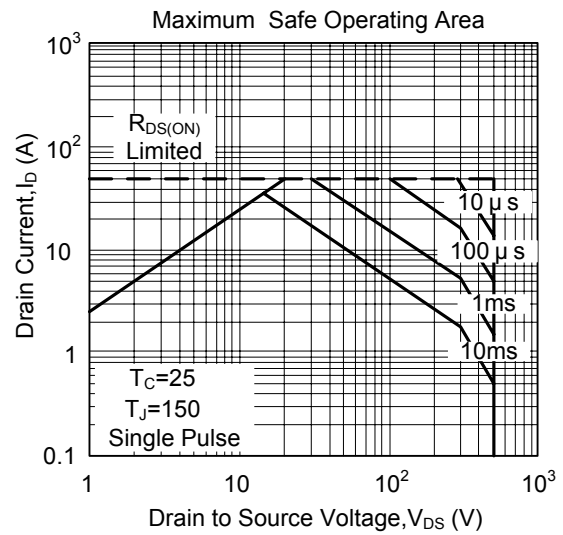
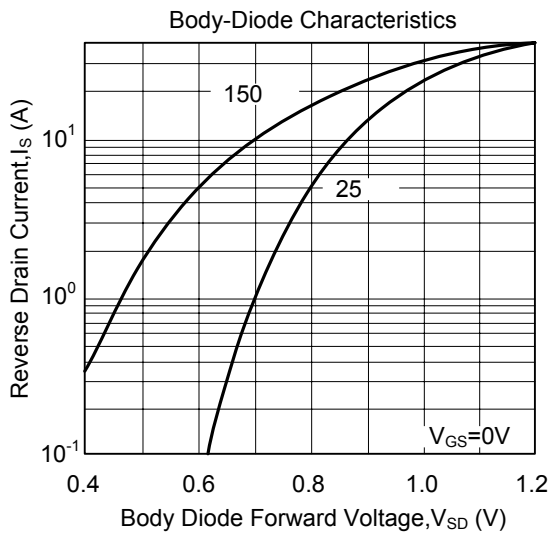
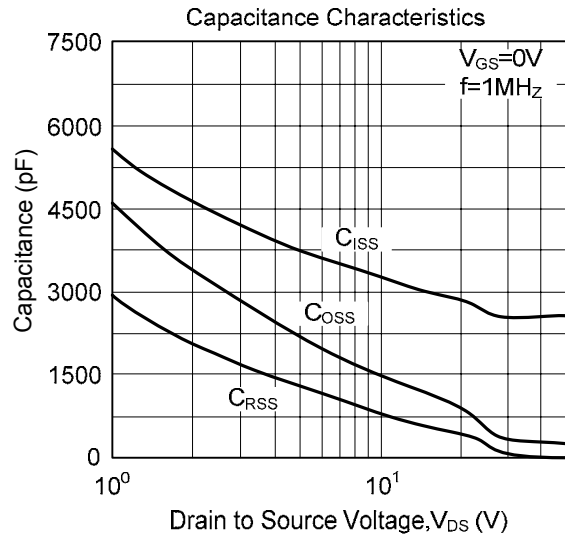
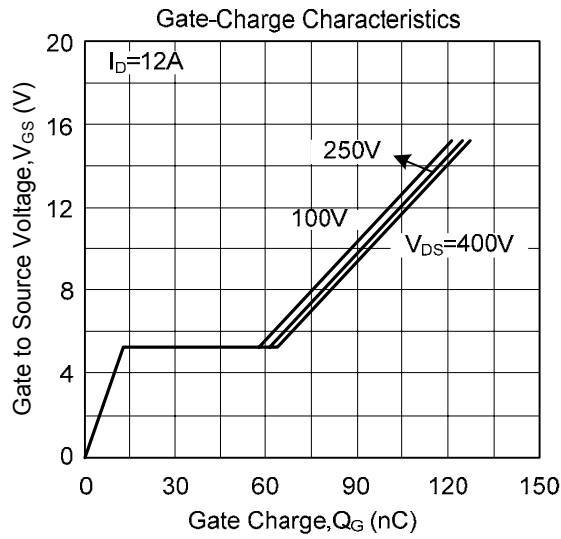
TEST CIRCUITS AND WAVEFORMS



■ TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS(Cont.)



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