



UNISONIC TECHNOLOGIES CO., LTD

UF450

Power MOSFET

12 Amps, 500 Volts
N-CHANNEL POWER
MOSFET

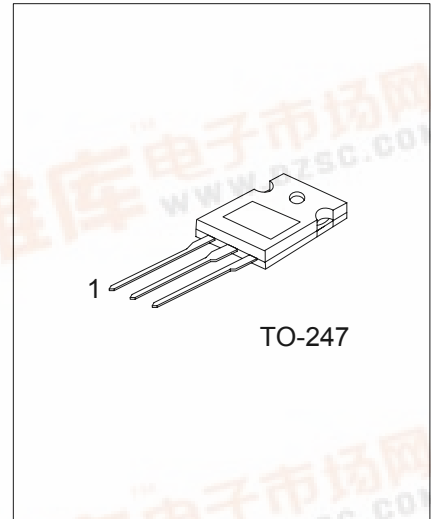
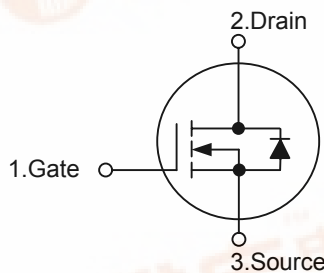
DESCRIPTION

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 ($C_{RSS} = \text{typical } 240pF$)
- * Fast switching capability
- * Avalanche energy specified
- * Improved dv/dt capability

SYMBOL



*Pb-free plating product number: UF450L

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

UF450L-T47-T (1)Packing Type (2)Package Type (3)Lead Plating		(1) T: Tube (2) T47: TO-247 (3) L: Lead Free Plating, Blank: Pb/Sn
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■ 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 ($T_C=25^\circ\text{C}$)	P_D	190	W
Peak Diode Recovery dv/dt (Note 2)	dv/dt	3.5	V/ns
Junction Temperature	T_J	+150	
Strong 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 ($T_J=25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0 V, I _D =1.0 mA	500			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =400V,V _{GS} =0 V			25	μA
Gate-Source Leakage Current	I _{GSS}	V _{DS} =0 V, V _{GS} = ±20V			±100	nA
Breakdown Voltage Temperature Coefficient	ΔBV _{DSS} /ΔT _J	Reference to 25 , I _D =1.0mA		0.78		V/
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250 μA	2.0		4.0	V
Static Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =7.75A			400	mΩ
		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 =2.35Ω			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			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 =12 A, dI/dt≤100A/μs, T _J =25 ,V _{DD} ≤50V (Note3)			1600	ns
Reverse Recovery Charge	Q _{RR}				14	μC

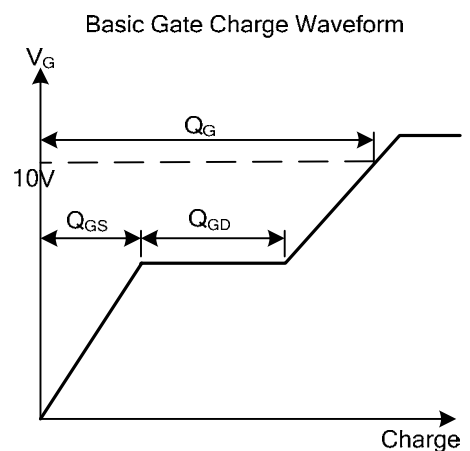
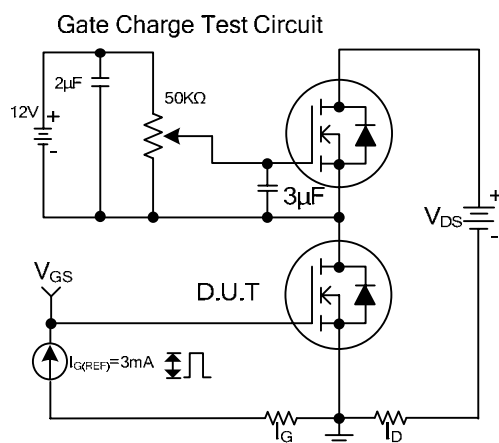
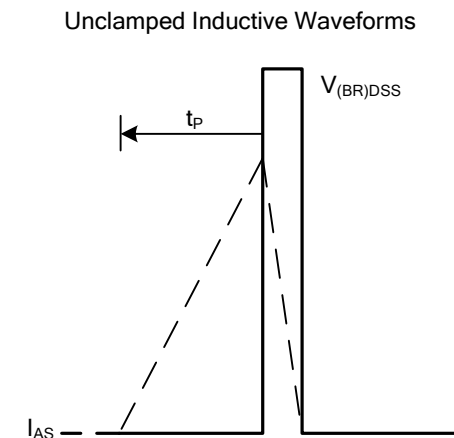
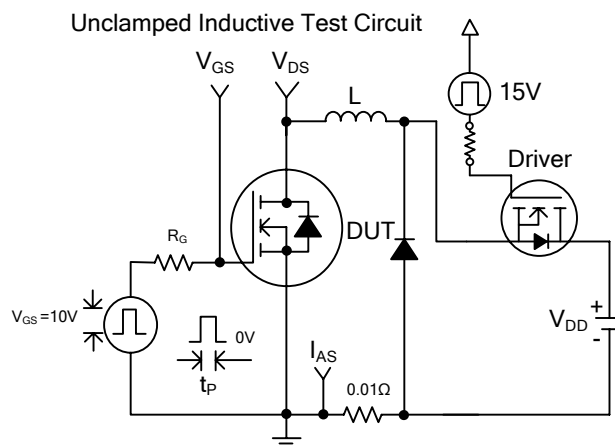
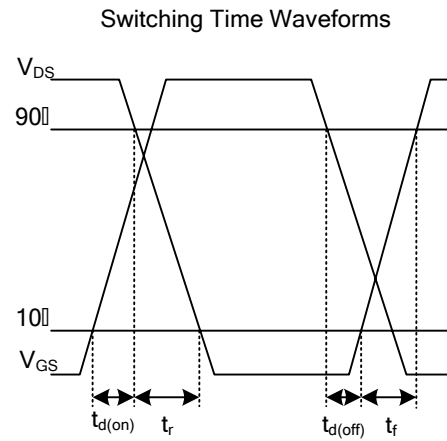
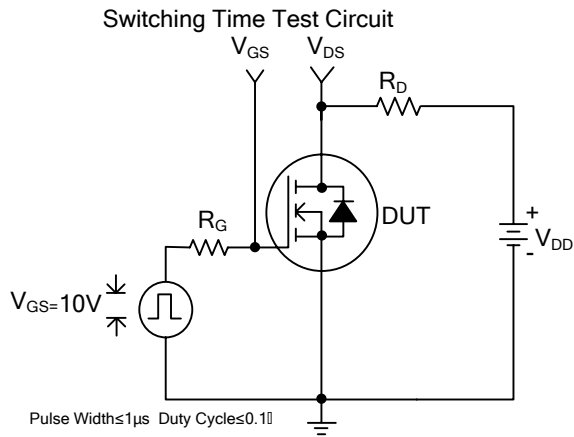
Notes: 1. Repetitive Rating : Pulse width limited by T_J

2. $V_{DD}=50\text{ V}$, starting $T_J=25^\circ\text{C}$, Peak $I_L=12\text{ A}$, $I_{SD} \leq 12$, $di/dt \leq 130\text{ A}/\mu\text{s}$, $V_{DD} \leq 500\text{ V}$,
 $T_J \leq 150^\circ\text{C}$ Suggested $R_G=2.35\Omega$

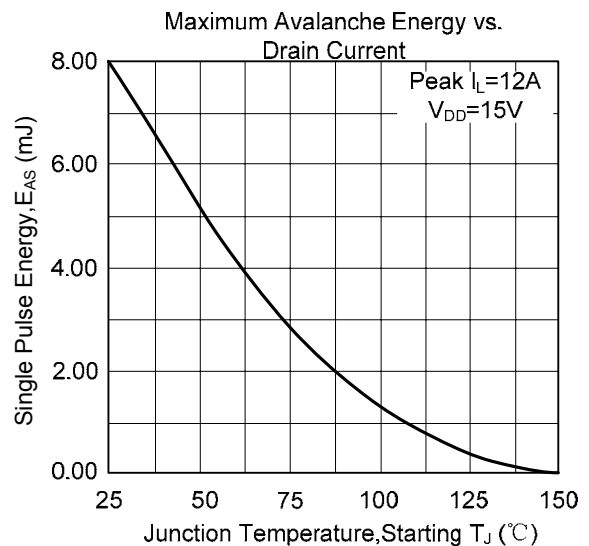
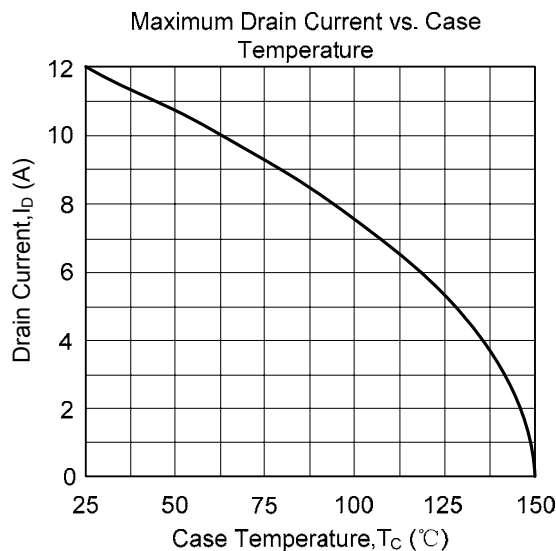
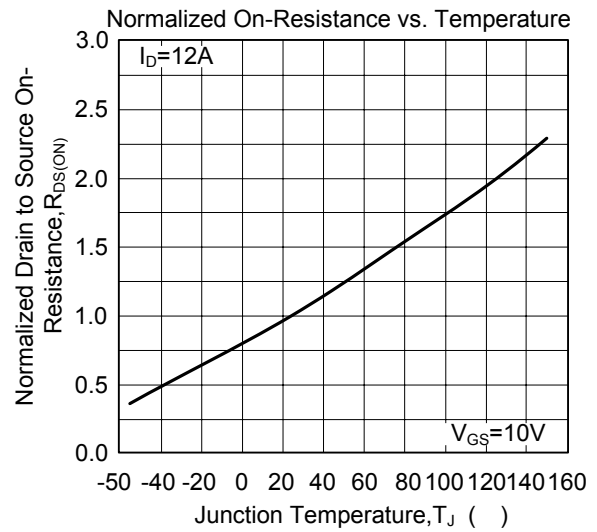
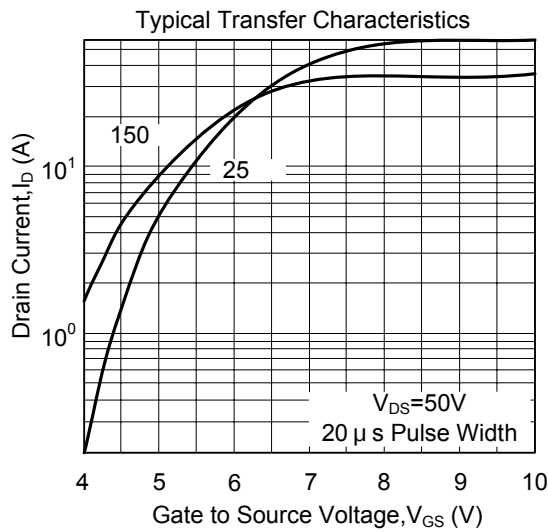
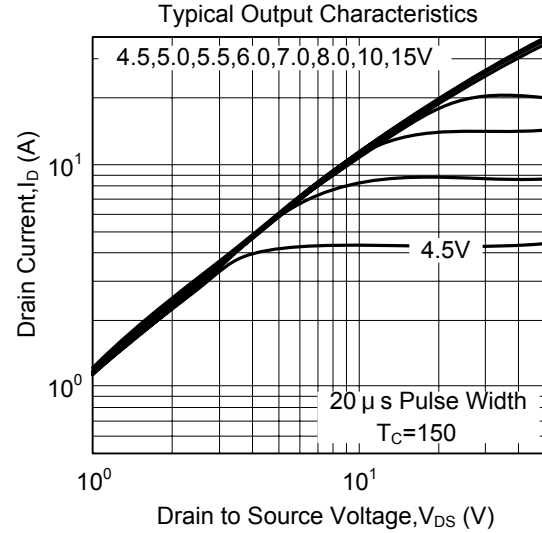
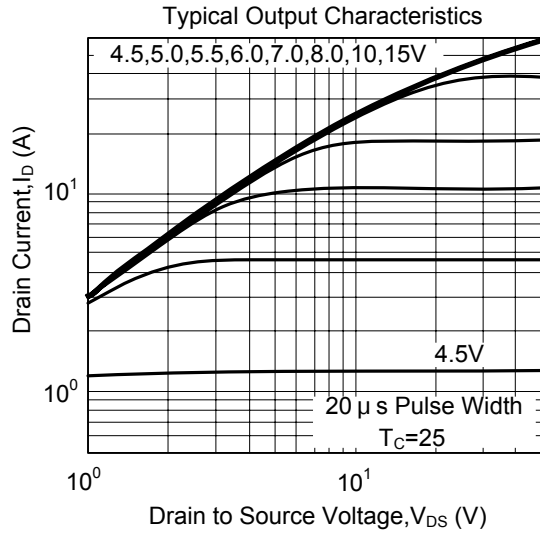
3. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$

4. Essentially independent of operating temperature

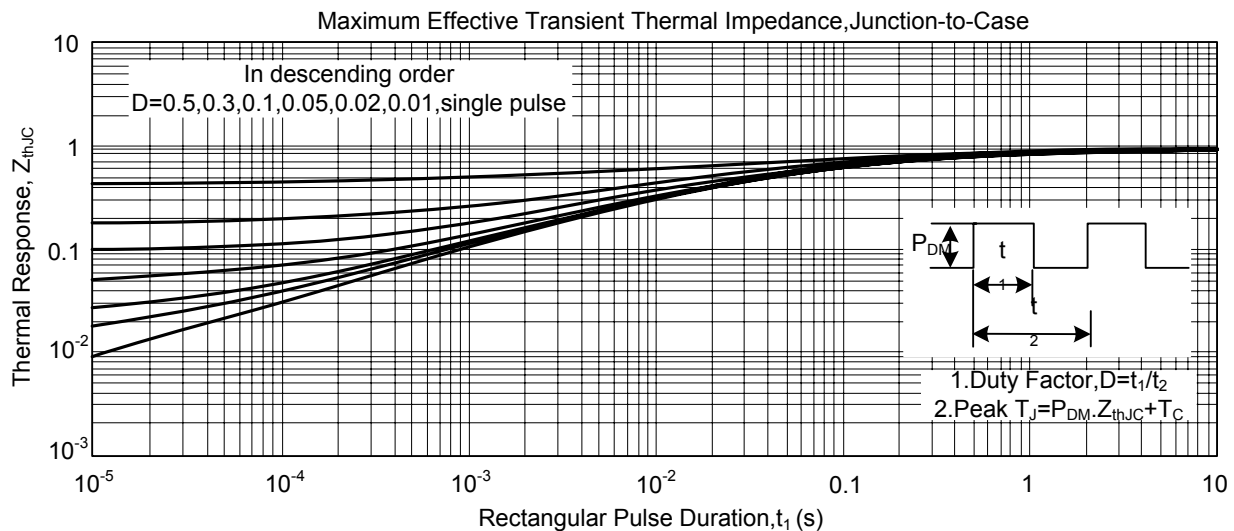
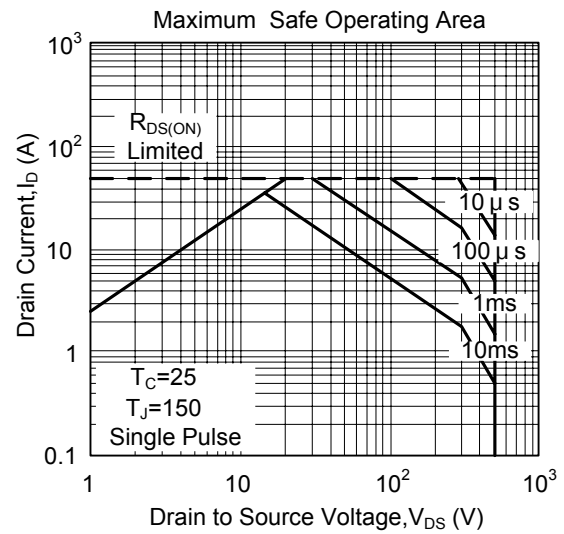
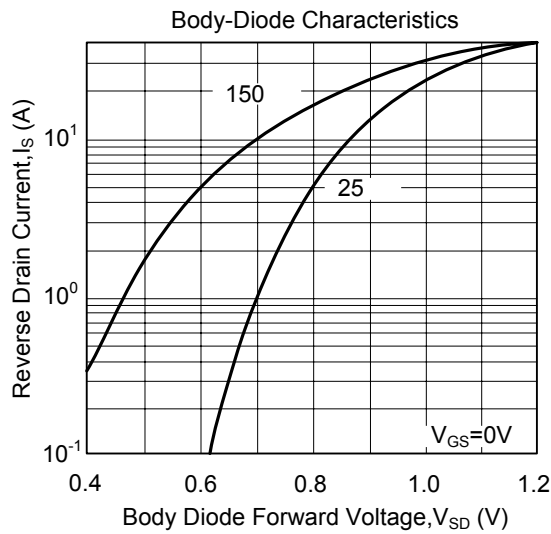
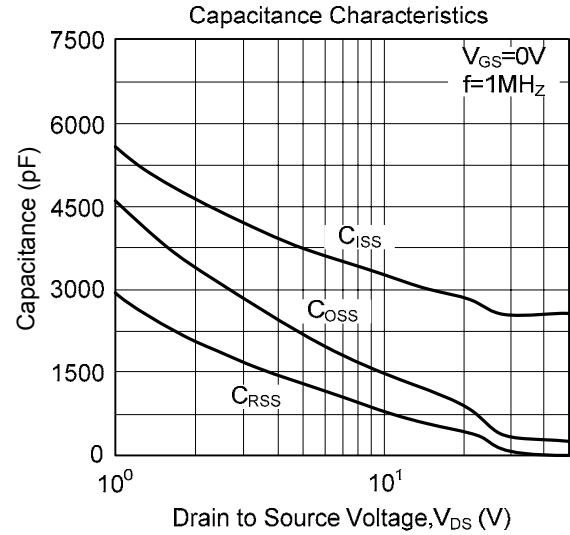
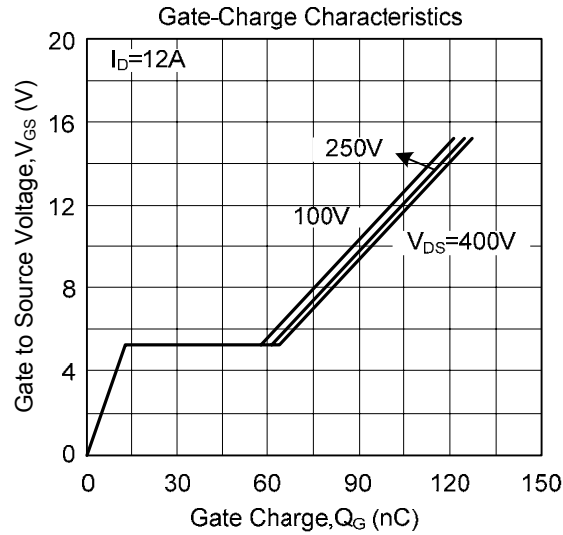
■ TEST CIRCUITS AND WAVEFORMS



■ TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS(Cont.)



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