

UTC UNISONIC TECHNOLOGIES CO., LTD

39N20

Preliminary

Power MOSFET

39A, 200V N-CHANNEL **POWER MOSFET**

DESCRIPTION

The UTC 39N20 is a N-channel mode power MOSFET using UTC's advanced technology to provide customers with a minimum on-state resistance, low gate charge and high switching speed.

The UTC 39N20 is suitable for high voltage synchronous rectifier and DC/DC converters, etc.

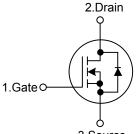
FEATURES

* R_{DS(ON)}<66mΩ @ V_{GS}=10V,I_D=19.5A

* Low Gate Charge (Typical 18.5nC)

* High Switching Speed

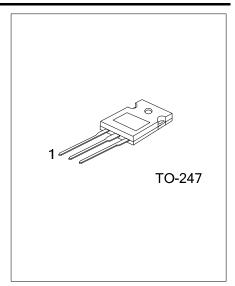
SYMBOL





ORDERING INFORMATION

Ordering Number			Deekers	Pin Assignment			Deeking	
Lead Free	Halogen Free		Package	1	2	3	Packing	
39N20L-T47-T	39N20G-T47-T		TO-247	G	D	D S Tube		
Note: Pin Assignment: G: Gate D: Drain S: Source								
39N20L-T47-T (1)Packing Type (2)Package Type (3)Lead Free		(1) T: Tube (2) T47: TO-247 (3) G: Halogen Free, L: Lead Free						



■ ABSOLUTE MAXIMUM RATINGS (Tc=25°C, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT	
Drain-Source Voltage		V _{DSS}	200	V	
Gate-Source Voltage		V _{GSS}	±20	V	
Drain Current	Continuous (V _{GS} =10V) T _C =25°C	ID	39	А	
	Pulsed	I _{DM}	156	А	
Single Pulsed Avalanche Energy (Note 2)		E _{AS}	860	mJ	
Power Dissipation		PD	310	W	
Junction Temperature		ΤJ	+150	°C	
Storage Temperature		T _{STG}	-55~+150	С°	

Notes: 1. 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.

2. Starting T_J = 25°C, L = 0.85mH, I_{AS} = 39A, V_{DD}=50V, R_G=25\Omega.

3. Pulse Width = 100µs

THERMAL DATA

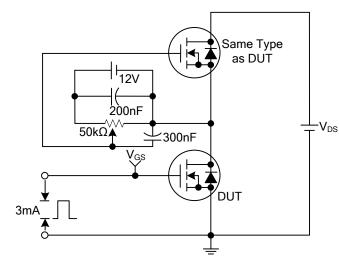
PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	40	°C/W
Junction to Case	θ _{JC}	0.37	°C/W

■ ELECTRICAL CHARACTERISTICS (T_C=25°C, unless otherwise specified)

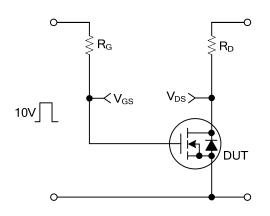
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
OFF CHARACTERISTICS								
Drain-Source Breakdown Voltage		BV _{DSS}	I _D =250µA, V _{GS} =0V	200			V	
Drain-Source Leakage Current		I _{DSS}	V _{DS} =200V, V _{GS} =0V			1	μA	
Gate- Source Leakage	Forward		V _{GS} =+20V, V _{DS} =0V			+100	nA	
Current	Reverse	I _{GSS}	V _{GS} =-20V, V _{DS} =0V			-100	nA	
ON CHARACTERISTICS								
Gate Threshold Voltage		V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250µA	2		4	V	
Static Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} =10V, I _D =19.5A		56	66	mΩ	
DYNAMIC PARAMETERS								
Input Capacitance	nput Capacitance C _{ISS}		V _{GS} =0V, V _{DS} =25V, f=1.0MHz		1250		рF	
Output Capacitance		C _{OSS}			190		рF	
Reverse Transfer Capacitance		C _{RSS}			45		рF	
SWITCHING PARAMETERS								
Total Gate Charge at 10V		Q_G			18.5	28	nC	
Gate to Source Charge		Q_{GS}	V _{GS} =10V,V _{DD} =50V,I _D =39A		6.5		nC	
Gate to Drain Charge		Q_{GD}			4.6		nC	
Turn-ON Time		t _{on}			30	70	ns	
Turn-ON Delay Time		t _{D(ON)}	V _{DD} =50V, I _D =39A, V _{GS} =10V,		160		ns	
Rise Time		t _R	R _G =16Ω		150		ns	
Turn-OFF Delay Time t _{D(OF}		$t_{D(OFF)}$			150		ns	
SOURCE- DRAIN DIODE RAT	INGS AND	CHARAC	TERISTICS					
Drain-Source Diode Forward Voltage V		V_{SD}	I _{SD} =39A			1.4	V	
Maximum Continuous Drain-So	ource	I.				39	А	
Diode Forward Current					29	~		
Maximum Pulsed Drain-Source Diode		I _{SM}				156	А	
Forward Current		ISM				150		



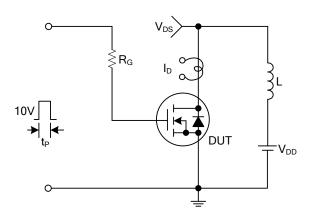
TEST CIRCUITS AND WAVEFORMS



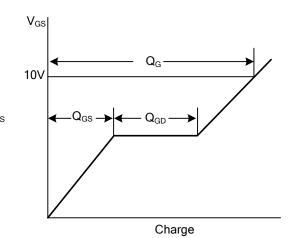
Gate Charge Test Circuit



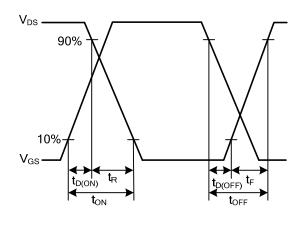
Resistive Switching Test Circuit



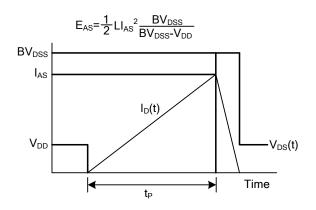
Unclamped Inductive Switching Test Circuit



Gate Charge Waveforms



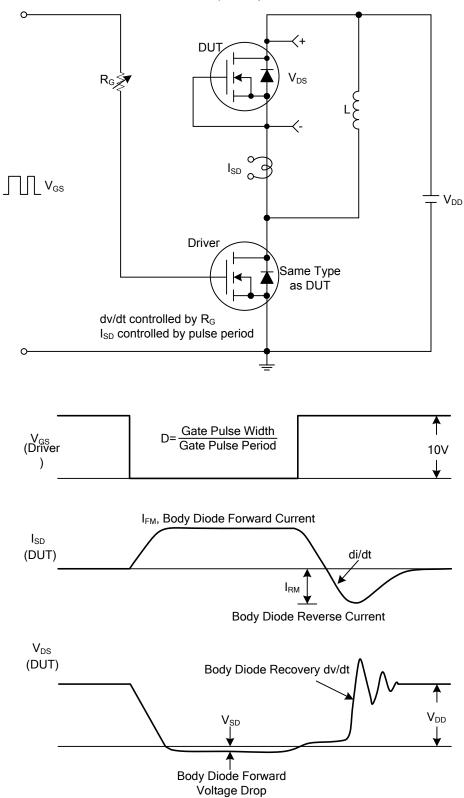
Resistive Switching Waveforms



Unclamped Inductive Switching Waveforms



TEST CIRCUITS AND WAVEFORMS(Cont.)



Peak Diode Recovery dv/dt Test Circuit and Waveforms



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