UNISONIC TECHNOLOGIES CO., LTD

UT30NN06 POWER MOSFET

30A, 60V N-CHANNEL POWER MOSFET

■ DESCRIPTION

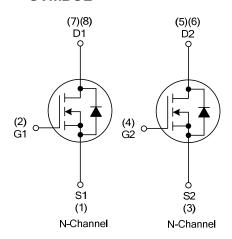
The UTC **UT30NN06** is a N-channel mode power MOSFET using UTC's advanced technology to provide customers with a minimum on-state resistance, low gate charge and high switching speed.

The UTC **UT30NN06** is suitable for high voltage synchronous rectifier and DC/DC converters, etc.

■ FEATURES

- * $R_{DS(ON)} \le 32 \text{ m}\Omega$ @ $V_{GS}=10\text{V}$, $I_D=15\text{A}$ $R_{DS(ON)} \le 40 \text{ m}\Omega$ @ $V_{GS}=4.5\text{V}$, $I_D=15\text{A}$
- * High Switching Speed
- * High Cell Density Trench Technology

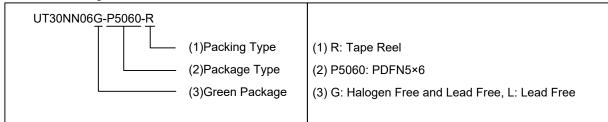
■ SYMBOL



ORDERING INFORMATION

Ordering Number		Dealcana	Pin Assignment							Daakina		
Lead Free	Halogen Free	Package	1	2	3	4	5	6	7	8	Packing	
UT30NN06L-P5060-R	UT30NN06G-P5060-R	PDFN5×6	S1	G1	S2	G2	D2	D2	D1	D1	Tape Reel	

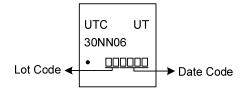
Note: Pin Assignment: G: Gate D: Drain S: Source



1 PDFN5×6

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■ MARKING



UT30NN06 Power MOSFET

■ **ABSOLUTE MAXIMUM RATING** (T_C=25°C, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V _{DSS}	60	V
Gate-Source Voltage		V _{GSS}	±20	V
Drain Current	Continuous	I _D	15	Α
	Pulsed (Note 2)	I_{DM}	30	Α
Avalanche Energy	Single Pulsed (Note 3)	E _{AS}	25	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	2.1	V/nS
Power Dissipation (Note 5)		P _D	20	W
Junction Temperature		T_J	+150	°C
Storage Temperature Range		T _{STG}	-55 ~ +150	°C

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. Repetitive Rating: Pulse width limited by maximum junction temperature
- 3. L=0.1mH, I_{AS} =22A, V_{DD} =50V, R_G = 25 Ω , Starting T_J = 25 $^{\circ}$ C
- 4. $I_{SD} \le 30A$, di/dt $\le 100A/\mu s$, $V_{DD} \le V_{(BR)DSS}$, $T_J \le 25$ °C

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT		
Junction to Ambient	θ_{JA}	35	°C/W		
Junction to Case	θ_{JC}	6.25	°C/W		

Note: Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

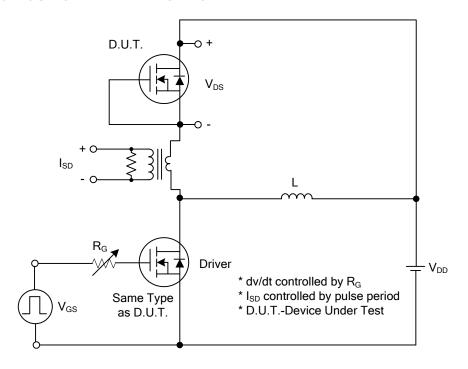
■ ELECTRICAL CHARACTERISTICS (T_J=25°C, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT		
OFF CHARACTERISTICS									
Drain-Source Breakdown Voltage		BV_{DSS}	$I_D = 250 \mu A, V_{GS} = 0 V$	60			V		
Drain-Source Leakage Current		I _{DSS}	V _{DS} =60V, V _{GS} =0V			1	μA		
Coto Source Lockers Comment	ward		V _{GS} =+20V, V _{DS} =0V			+100	nA		
Gate-Source Leakage Current Rev	erse	I _{GSS}	V _{GS} =-20V, V _{DS} =0V			-100	nA		
ON CHARACTERISTICS									
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}$, $I_{D}=250\mu A$	1.0		3.0	V			
Static Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} =10V, I _D =15A		26	32	mΩ		
			V _{GS} =4.5V, I _D =15A		30	40	mΩ		
DYNAMIC PARAMETERS									
Input Capacitance		C _{ISS}			1780		pF		
Output Capacitance		Coss	V_{GS} =0V, V_{DS} =25V, f=1.0MHz		98		pF		
Reverse Transfer Capacitance		C _{RSS}			72		pF		
SWITCHING PARAMETERS				_	_				
Total Gate Charge (Note 1)		Q_G	\\ -40\\ \\ -40\\ \ \ -20\\		40		nC		
Gate to Source Charge		Q_GS	V _{DS} =48V, V _{GS} =10V, I _D =30A		11		nC		
Gate to Drain Charge		Q_GD	(Note 1, 2)		6		nC		
Turn-on Delay Time (Note 1)		$t_{D(ON)}$			17		ns		
Rise Time		t_R	V_{DS} =30V, V_{GS} =10V, I_{D} =30A,		16.5		ns		
Turn-off Delay Time		$t_{D(OFF)}$	R _G =3Ω (Note 1, 2)		44		ns		
Fall-Time		t _F			17		ns		
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS									
Maximum Body-Diode Continuous Current		Is				15	Α		
Maximum Body-Diode Pulsed Current		I _{SM}				30	Α		
Drain-Source Diode Forward Voltage (No	V_{SD}	I _S =30A, V _{GS} =0V			1.4	V			
Reverse Recovery Time (Note 1)		t _{rr}	I _S =30A, V _{GS} =0V,		52		nS		
Reverse Recovery Charge		Q_{rr}	dI/dt=100A/μs		30		nC		

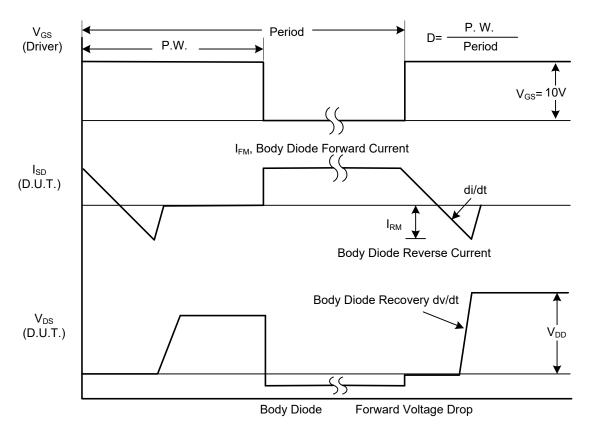
Notes: 1. Pulse Test: Pulse width ≤ 300µs, Duty cycle ≤ 2%.

2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS

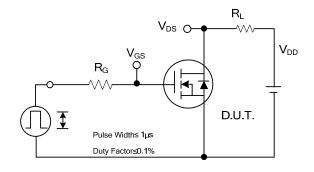


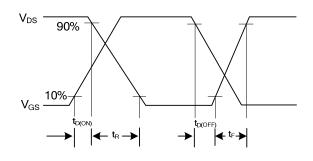
Peak Diode Recovery dv/dt Test Circuit



Peak Diode Recovery dv/dt Waveforms

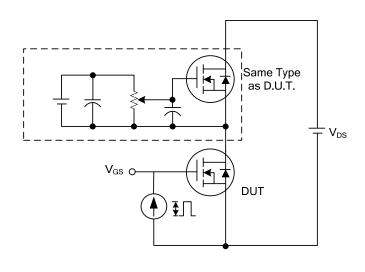
■ TEST CIRCUITS AND WAVEFORMS

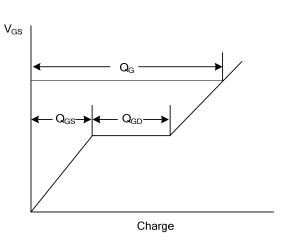




Switching Test Circuit

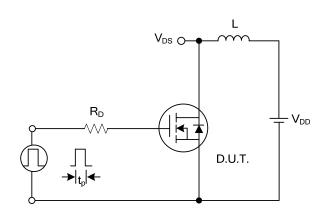
Switching Waveforms

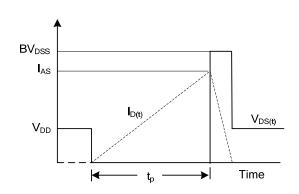




Gate Charge Test Circuit

Gate Charge Waveform

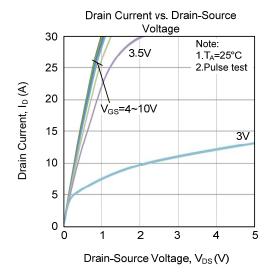


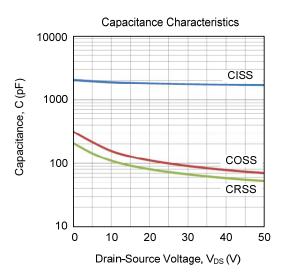


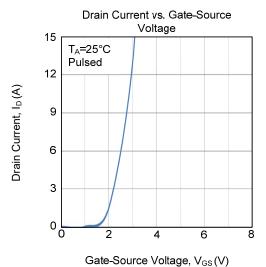
Unclamped Inductive Switching Test Circuit

Unclamped Inductive Switching Waveforms

■ TYPICAL CHARACTERISTICS







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