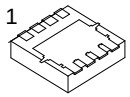
40A, 60V N-CHANNEL POWER MOSFET



DFN3030-8

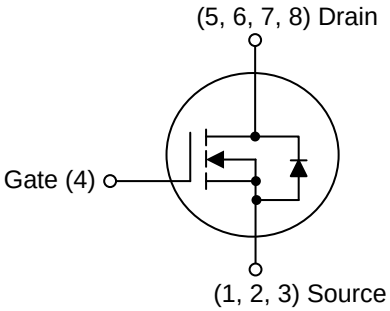
■ DESCRIPTION

The UTC **UT40N06** is a high voltage power MOSFET combines advanced trench MOSFET designed to have better characteristics, such as fast switching time, low gate charge, low on-state resistance and high rugged avalanche characteristics. This power MOSFET is usually used in high speed switching applications of switching power supplies and adaptors.

■ FEATURES

* $R_{DS(ON)}$ ≤ 17 mΩ @ V_{GS}=10V, I_D=20A
  $R_{DS(ON)}$ ≤ 30 mΩ @ V_{GS}=4.5V, I_D=20A
* Low on-Resistance
* Fast Switching Speed

■ SYMBOL



■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UT40N06L-K08-3030-R	UT40N06G-K08-3030-R	DFN3030-8	S	S	S	G	D	D	D	D	Tape Reel

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

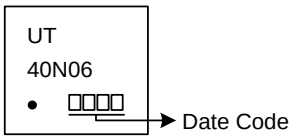
UT40N06G-K08-3030-R

(1)Packing Type — (1) R: Tape Reel

(2)Package Type — (2) K08-3030: DFN3030-8

(3)Green Package — (3) G: Halogen Free and Lead Free, K: Lead Free

■ MARKING



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■ ABSOLUTE MAXIMUM RATINGS (T_C=25°C Unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D	40	A
Pulsed Drain Current (Note 1)	I_{DM}	80	A
Avalanche Energy	E_{AS}	8	mJ
Peak Diode Recovery dv/dt (Note 4)	dv/dt	2.3	V/ns
Power Dissipation	P_D	60	W
Operating Junction Temperature	T_J	-55 ~ +150	°C
Storage Temperature	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}=12.7A, V_{DD}=20V, R_G=25 Ω, Starting T_J = 25°C
4. I_{SD}≤40A, di/dt≤200A/μs, V_{DD}≤ BV_{DSS}, Starting T_J = 25°C

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	41.6	°C/W
Junction to Case	θ_{JC}	2.08	°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=250μA, V_{GS}=0V	60			V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=60V, V_{GS}=0V			10	μA
Gate- Source Leakage Current	I_{GSS}	V_{GS}=±20V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250μA	1.0		3.0	V
Static Drain-Source On-State Resistance (Note 1)	$R_{DS(ON)}$	V_{GS}=10V, I_D=20A			17	mΩ
		V_{GS}=4.5V, I_D=20A			30	mΩ
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	V_{GS}=0V, V_{DS}=25V, f=1.0MHz		1950		pF
Output Capacitance	C_{OSS}			180		pF
Reverse Transfer Capacitance	C_{RSS}			140		pF
SWITCHING PARAMETERS (Note 2)						
Total Gate Charge	Q_G	V_{DS}=48V, V_{GS}=4.5V, I_D=40A, I_G=1mA (Note1,2)		22		nC
Gate to Source Charge	Q_{GS}			6		nC
Gate to Drain Charge	Q_{GD}			10		nC
Turn-ON Delay Time	$t_{D(ON)}$	V_{DS}=30V, V_{GS}=10V, I_D=40A, R_G=3Ω (Note1,2)		8		ns
Rise Time	t_R			16		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			32		ns
Fall-Time	t_F			18		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Continuous Drain-Source Diode Forward Current	I_S				40	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}				80	A
Drain-Source Diode Forward Voltage	V_{SD}	I_F=40A, V_{GS}=0V			1.3	V
Reverse Recovery Time	t_{rr}	I_S=30A , V_{GS}=0V di/dt=100A/μs		40		ns
Reverse Recovery Charge	Q_{rr}			68		nC

Notes: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle≤2%.
2. Essentially independent of operating temperature.

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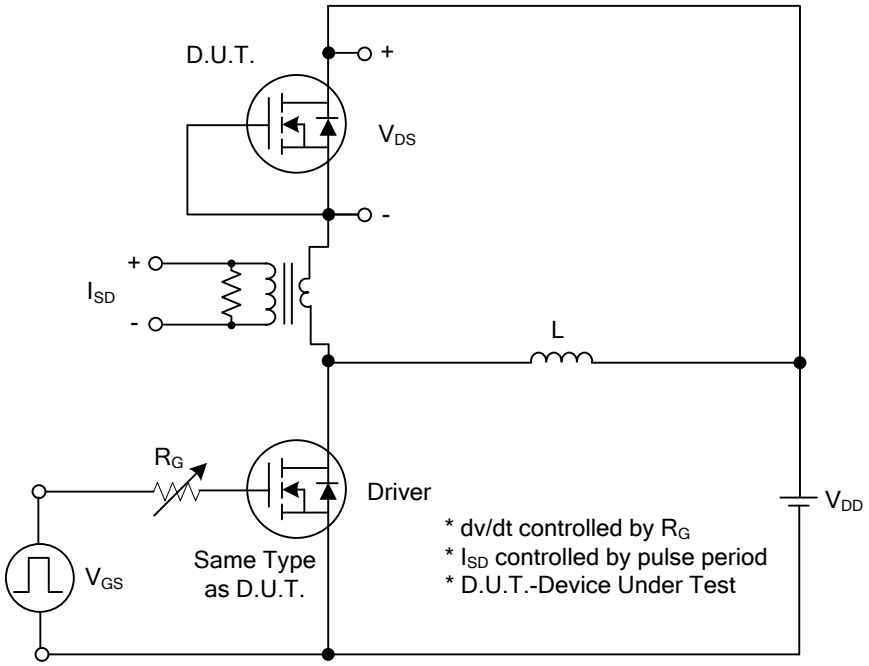
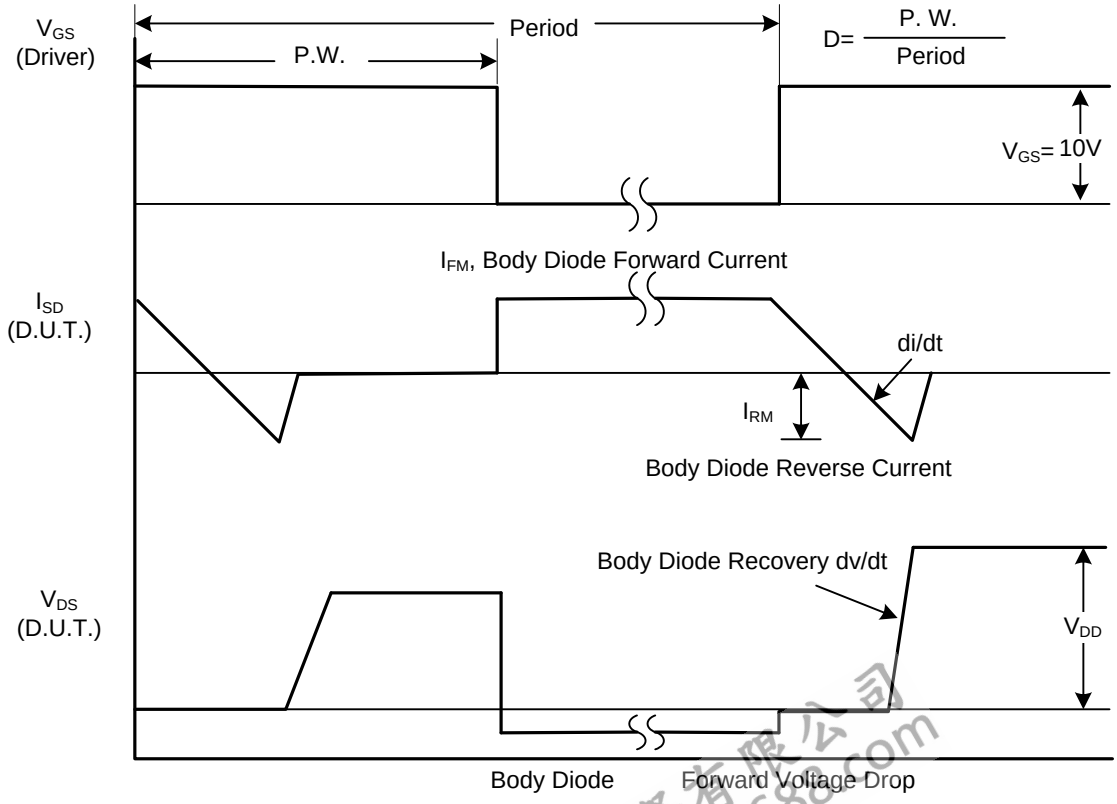
■ TEST CIRCUITS AND WAVEFORMS



Peak Diode Recovery dv/dt Test Circuit



Peak Diode Recovery dv/dt Waveforms

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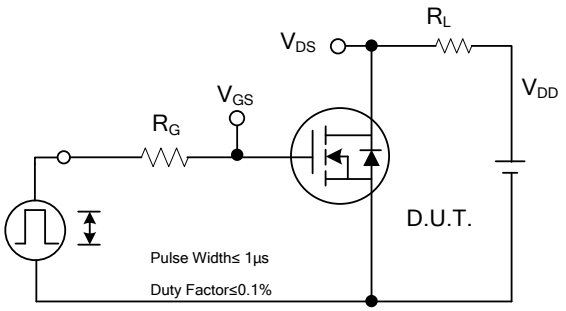
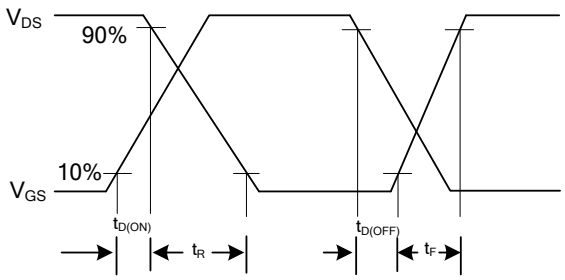
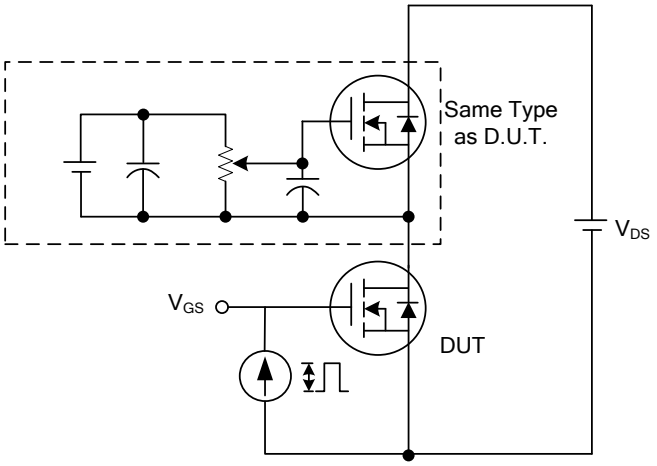
■ TEST CIRCUITS AND WAVEFORMS



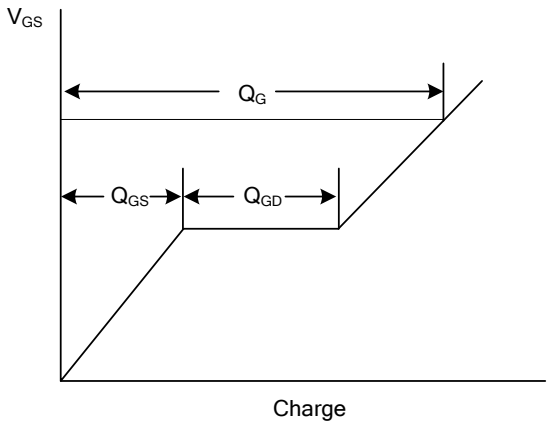
Switching Test Circuit



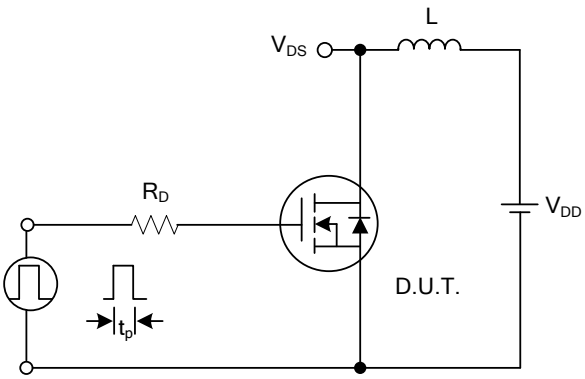
Switching Waveforms



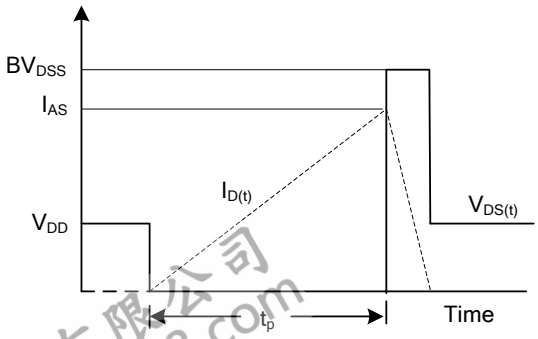
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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