

**UTT7N03M****POWER MOSFET**

7A, 30V N-CHANNEL ENHANCEMENT MODE TRENCH POWER MOSFET

DESCRIPTION

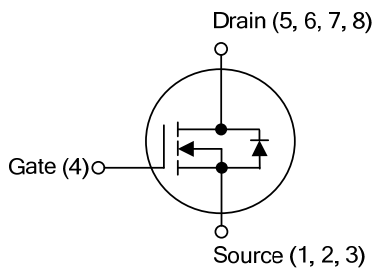
The UTC **UTT7N03M** is a N-channel Power MOSFET, it uses UTC's advanced technology to provide the customers with low $R_{DS(on)}$ characteristic by high cell density trench technology.

The UTC **UTT7N03M** is suitable for high efficiency synchronous rectification in SMPS, UPS, hard switched and high frequency circuits.

FEATURES

- * $R_{DS(ON)} \leq 30 \text{ m}\Omega$ @ $V_{GS}=10\text{V}$, $I_D=7.0\text{A}$
- $R_{DS(ON)} \leq 40 \text{ m}\Omega$ @ $V_{GS}=4.5\text{V}$, $I_D=7.0\text{A}$
- * High Cell Density Trench Technology
- * High Power and Current Handling Capability

SYMBOL



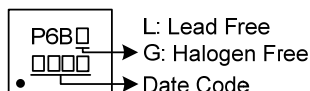
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment						Packing
Lead Free	Halogen Free		1	2	3	4	5	6	
UTT7N03ML-K06-2020-R	UTT7N03MG-K06-2020-R	DFN2020-6	D	D	G	D	D	S	Tape Reel

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

UTT7N03MG-K06-2020-R		(1)Packing Type	(1) R: Tape Reel
		(2)Package Type	(2) K06-2020: DFN2020-6
		(3)Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free

MARKING



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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V _{DSS}	30	V
Gate-Source Voltage		V _{GSS}	±20	V
Drain Current	Continuous	I _D	7	A
	Pulsed (Note 2)	I _{DM}	28	A
Avalanche Energy (Note 3)	Single Pulsed (Note 3)	E _{AS}	6	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	1.8	V/ns
Power Dissipation		P _D	1.6	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 = 0.1 mH, I_{AS} = 11A, V_{DD} = 25V, R_G = 25Ω, Starting T_J = 25°C.

4. I_{SD} ≤ 7.0A, di/dt ≤ 200A/μs, V_{DD} ≤ V_{(BR)DSS}, T_J = 25°C.

■ THERMAL RESISTANCES CHARACTERISTICS

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient		θ _{JA}	75	°C/W
Junction to Case		θ _{JC}	2.6	°C/W

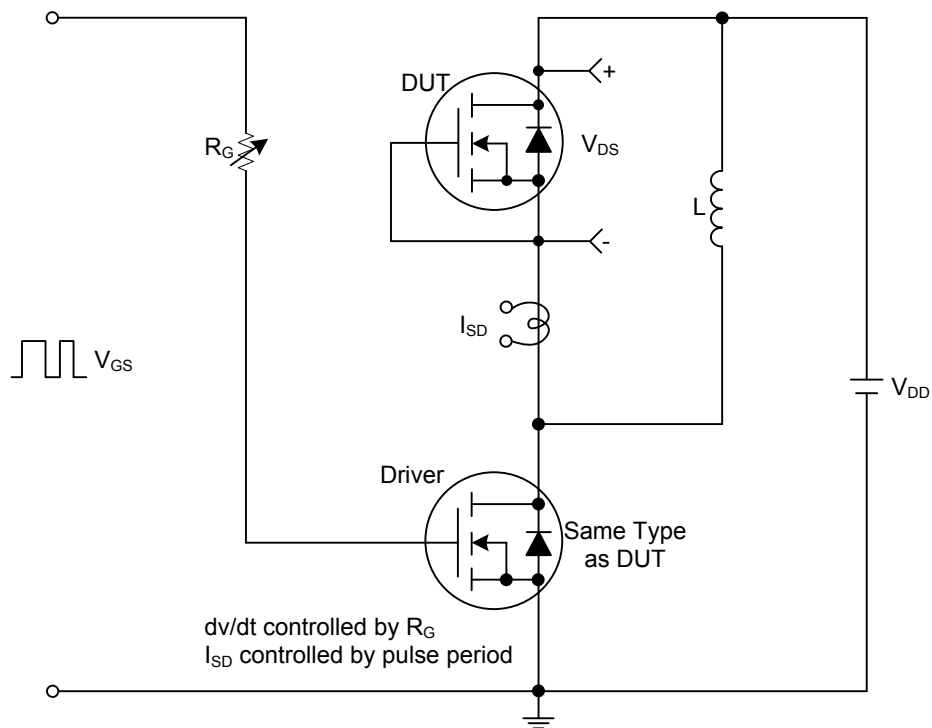
■ ELECTRICAL CHARACTERISTICS (T_J = 25°C, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	I _D =250μA, V _{GS} =0V	30			V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =30V, V _{GS} =0V			1.0	μA
Gate-Source Leakage Current	Forward	I _{GSS}	V _{GS} =+20V, V _{DS} =0V			+100	nA
	Reverse		V _{GS} =-20V, V _{DS} =0V			-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		R _{DS(ON)}	V _{GS} =10V, I _D =7.0A			30	mΩ
			V _{GS} =4.5V, I _D =7.0A			40	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =15V, f=1.0MHz		343		pF
Output Capacitance		C _{OSS}			74		pF
Reverse Transfer Capacitance		C _{RSS}			50		pF
SWITCHING PARAMETERS							
Total Gate Charge (Note 1)		Q _G	V _{DS} =24V, V _{GS} =10V, I _D =7.0A, I _G =1mA (Note 1, 2)		12		nC
Gate to Source Charge		Q _{GS}			1.7		nC
Gate to Drain Charge		Q _{GD}			3.5		nC
Turn-on Delay Time (Note 1)		t _{D(ON)}	V _{DS} =15V, V _{GS} =10V, I _D =7.0A, R _G =25Ω (Note 1, 2)		9.6		ns
Rise Time		t _R			8.0		ns
Turn-off Delay Time		t _{D(OFF)}			29		ns
Fall-Time		t _F			21		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I _S				7.0	A
Maximum Body-Diode Pulsed Current		I _{SM}				28	A
Drain-Source Diode Forward Voltage (Note 1)		V _{SD}	I _S =7.0A, V _{GS} =0V			1.2	V
Reverse Recovery Time (Note 1)		t _{rr}	I _S =7.0A, V _{GS} =0V,		250		nS
Reverse Recovery Charge		Q _{rr}	dI _F /dt =100A/μs		275		nC

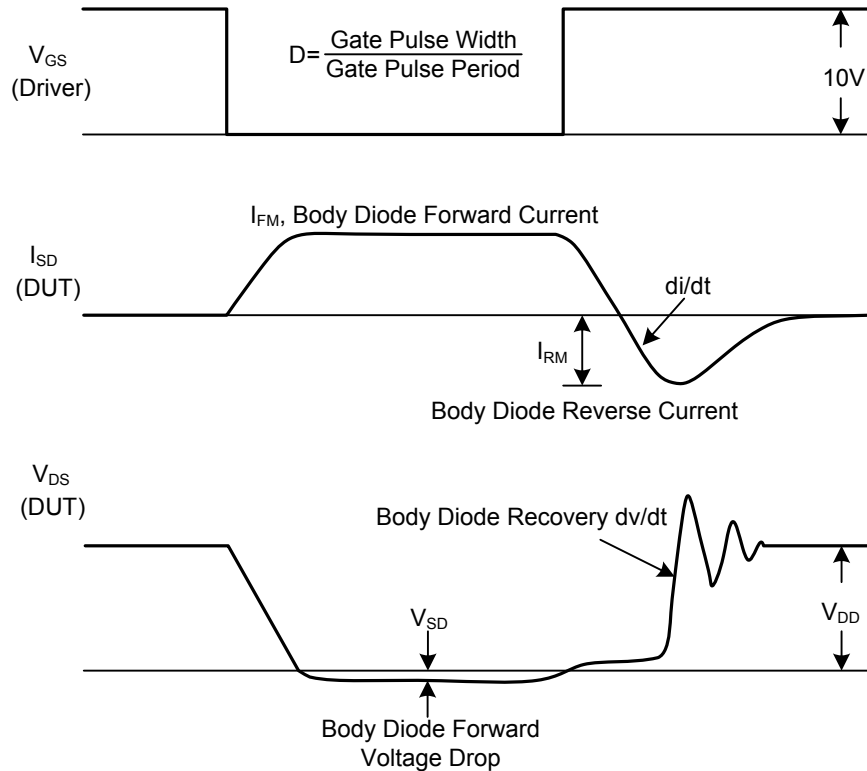
Notes: 1. Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2%.

2. Essentially independent of operating ambient temperature.

■ TEST CIRCUITS AND WAVEFORMS



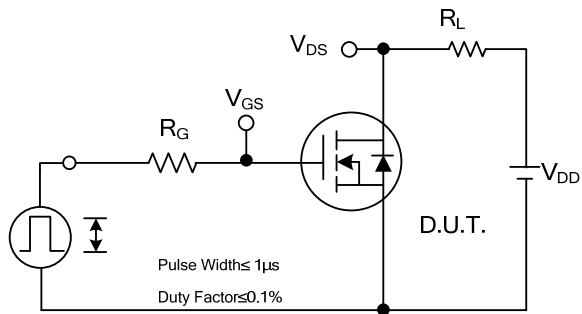
Peak Diode Recovery dv/dt Test Circuit



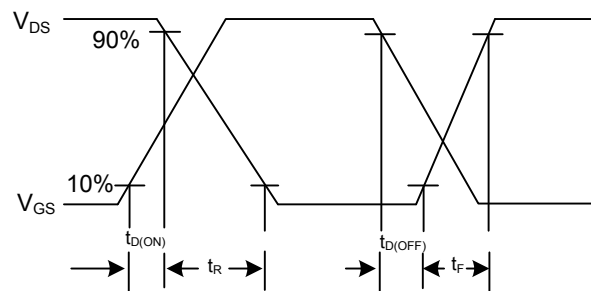
Peak Diode Recovery dv/dt Test Circuit and Waveforms

Peak Diode Recovery dv/dt Waveforms

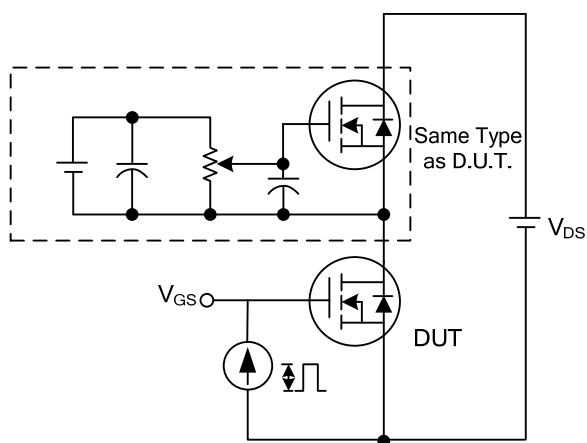
■ TEST CIRCUITS AND WAVEFORMS



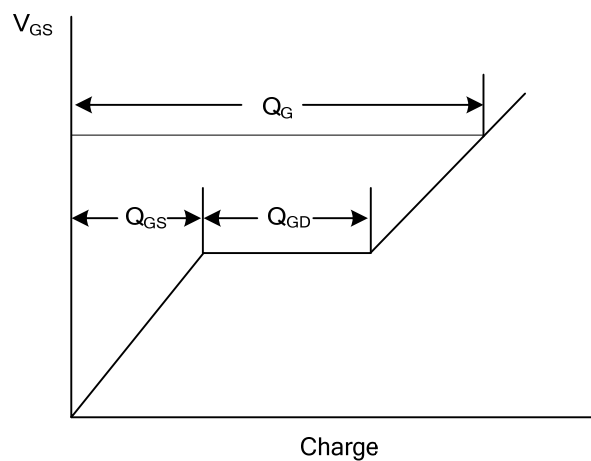
Switching Test Circuit



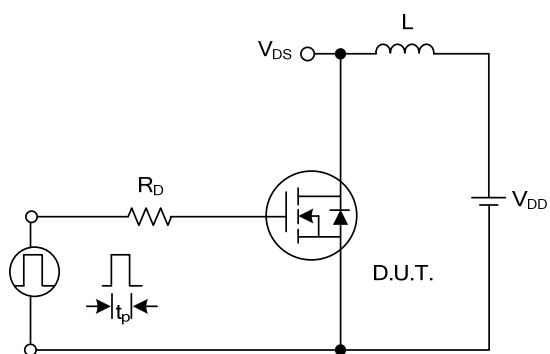
Switching Waveforms



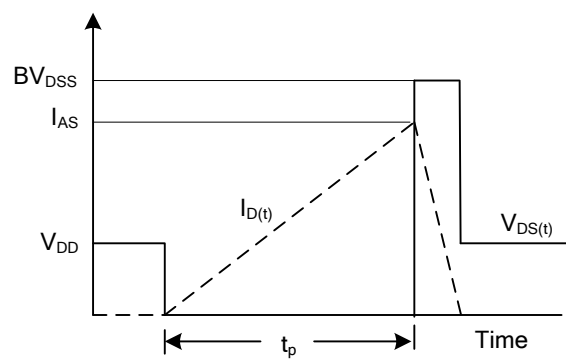
Gate Charge Test Circuit



Gate Charge Waveform

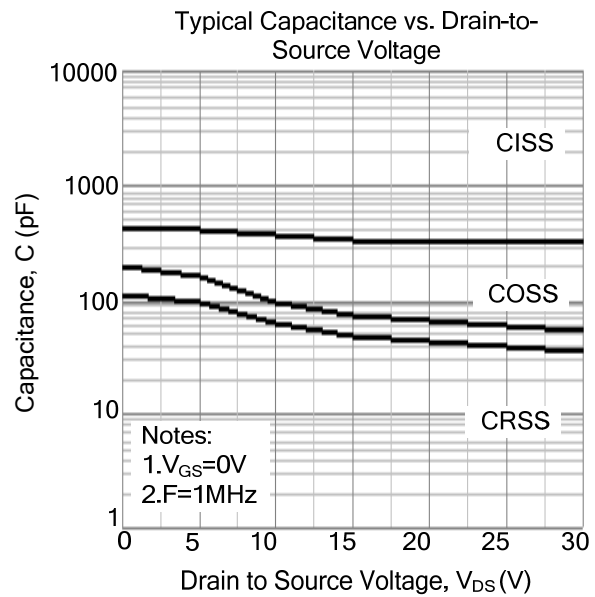
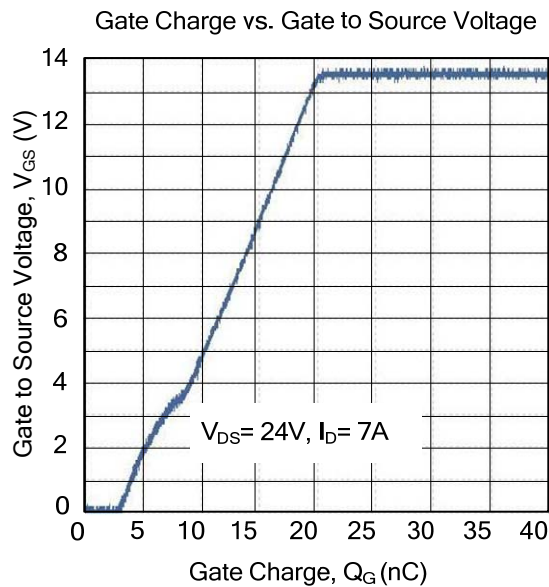


Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

TYPICAL CHARACTERISTICS



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