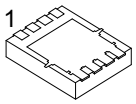
UTT100N07

Power MOSFET

100A, 65V N-CHANNEL POWER MOSFET



PDFN5×6

■ DESCRIPTION

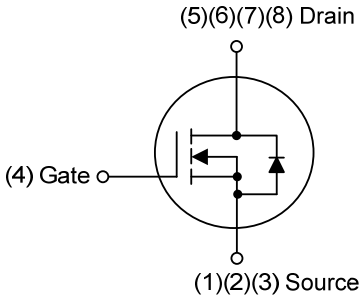
UTC **UTT100N07** is a N-Channel enhancement mode power field effect transistors are using trench DMOS technology.

This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency fast switching applications.

■ FEATURES

* $R_{DS(ON)}$ ≤ 2.8 mΩ @ V_{GS}=10V, I_D=20A
  $R_{DS(ON)}$ ≤ 5.4 mΩ @ V_{GS}=4.5V, I_D=10A
* Improved dv/dt capability
* Fast switching
* 100% EAS Guaranteed

■ SYMBOL



■ ORDERING INFORMATION

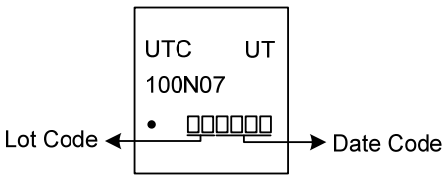
Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UTT100N07L-P5060-R	UTT100N07G-P5060-R	PDFN5×6	S	S	S	G	D	D	D	D	Tape Reel

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

UTT100N07G-P5060-R

(1)Packing Type	(1) R: Tape Reel
(2)Package Type	(2) P5060: PDFN5×6
(3)Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



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

PARAMETER			SYMBOL	RATINGS	UNIT
Drain-Source Voltage			V_{DSS}	65	V
Gate-Source Voltage			V_{GSS}	+20 / -12	V
Drain Current	Continuous	T_C=25°C	I_D	100	A
		T_C=100°C		63	A
	Pulsed (Note 2)		I_{DM}	400	A
Avalanche Energy (Note 3)		Single Pulsed	E_{AS}	245	mJ
Power Dissipation			P_D	142	W
Junction Temperature			T_J	+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}=70A, V_{DD}=25V, R_G=25 Ω, Starting T_J = 25°C.
4. I_{SD}≤3.0A, di/dt≤200A/μs, V_{DD}≤BV_{DSS}, Starting T_J=25°C.

■ THERMAL DATA

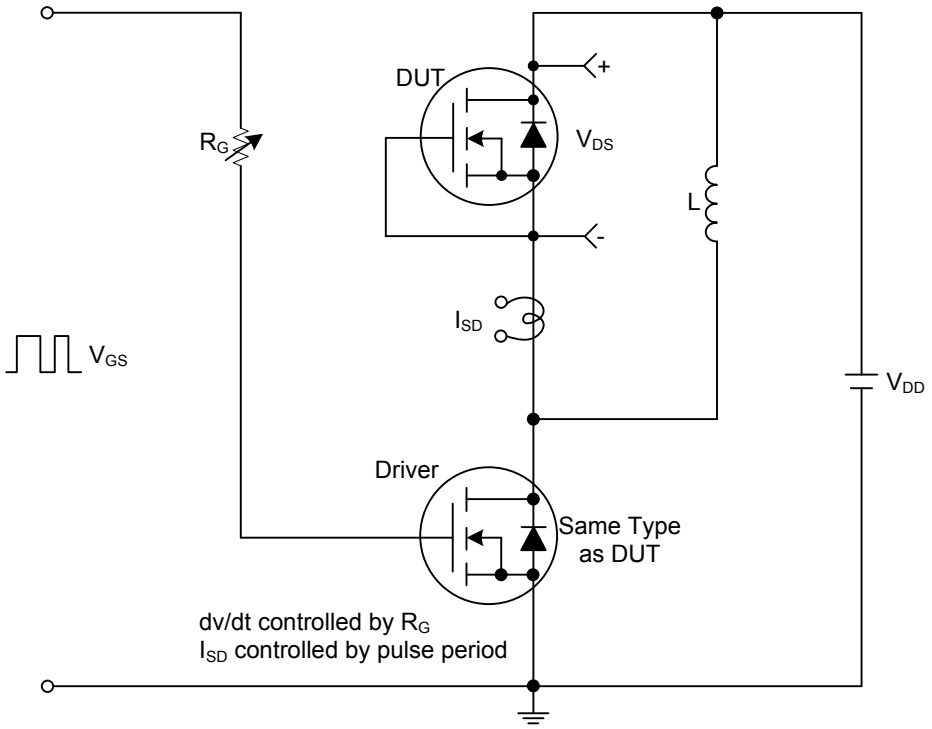
PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	62	°C/W
Junction to Case	θ_{JC}	0.88	°C/W

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

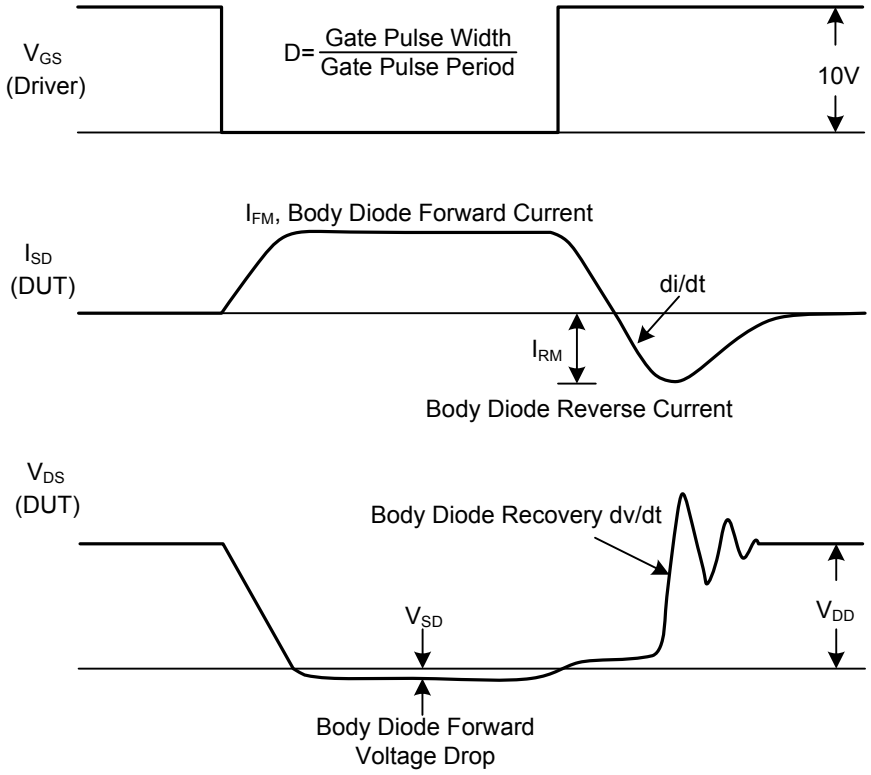
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	I_D=250μA, V_{GS}=0V	65			V
Drain-Source Leakage Current		I_{DSS}	V_{DS}=60V, V_{GS}=0V			1	μA
			V_{DS}=48V, V_{GS}=0V			10	μA
Gate-Source Leakage Current	Forward	I_{GSS}	V_{GS}=+20V, 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	1.6	2.5	V
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	V_{GS}=10V, I_D=20A		2.3	2.8	mΩ
			V_{GS}=4.5V, I_D=10A		4.2	5.4	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	V_{GS}=0V, V_{DS}=25V, f=1.0MHz		4780	9500	pF
Output Capacitance		C_{OSS}			1365	2700	pF
Reverse Transfer Capacitance		C_{RSS}			51	102	pF
SWITCHING PARAMETERS							
Total Gate Charge (Note 1)		Q_G	V_{DS}=48V, V_{GS}=10V, I_D=10A		59	120	nC
Gate to Source Charge		Q_{GS}			10.4	20	nC
Gate to Drain Charge		Q_{GD}			19.6	38	nC
Turn-on Delay Time (Note 1)		$t_{D(ON)}$	V_{DS}=30V, V_{GS}=10V, I_D=6.0A, R_G=1.0Ω		22	44	ns
Rise Time		t_R			14	28	ns
Turn-off Delay Time		$t_{D(OFF)}$			40	80	ns
Fall-Time		t_F			20	40	ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I_S				100	A
Maximum Body-Diode Pulsed Current		I_{SM}				200	A
Drain-Source Diode Forward Voltage (Note 1)		V_{SD}	I_S=1.0A, V_{GS}=0V			1.0	V

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

■ TEST CIRCUITS AND WAVEFORMS



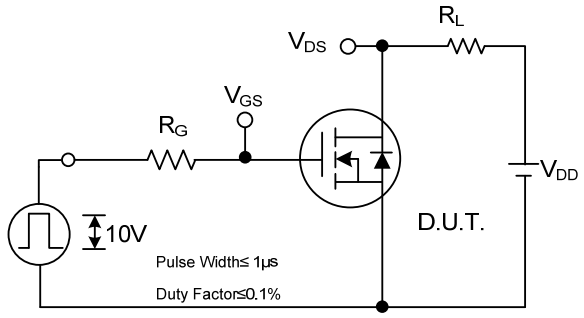
Peak Diode Recovery dv/dt Test Circuit



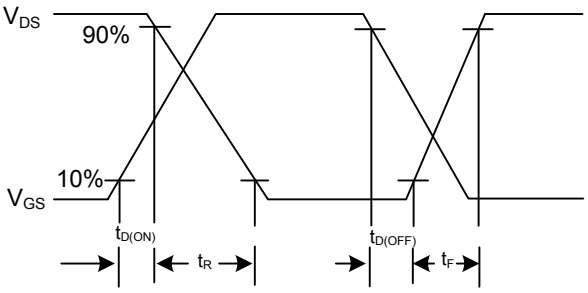
Peak Diode Recovery dv/dt Test Circuit and Waveforms

Peak Diode Recovery dv/dt Waveforms

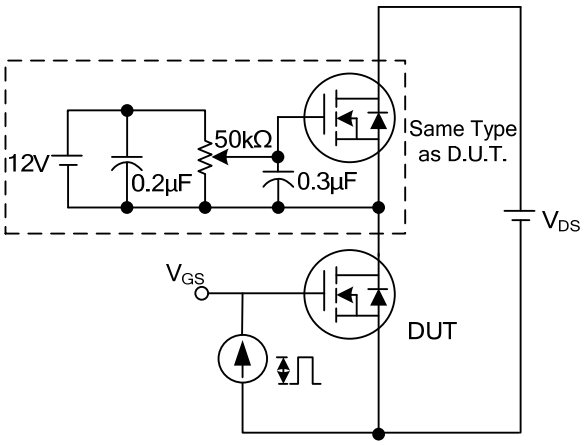
■ TEST CIRCUITS AND WAVEFORMS



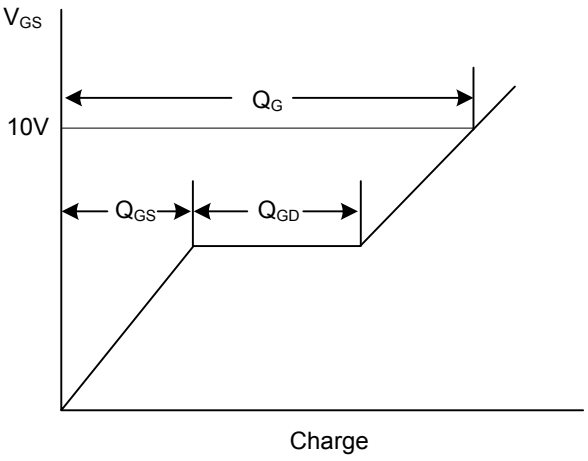
Switching Test Circuit



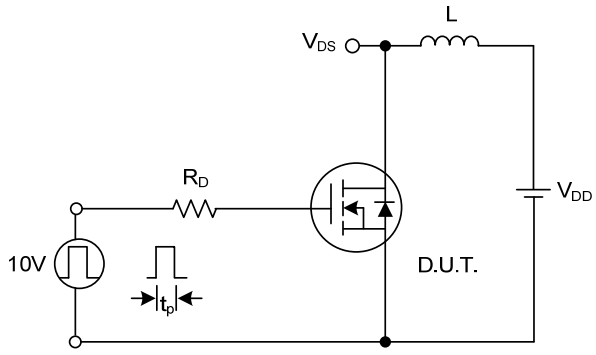
Switching Waveforms



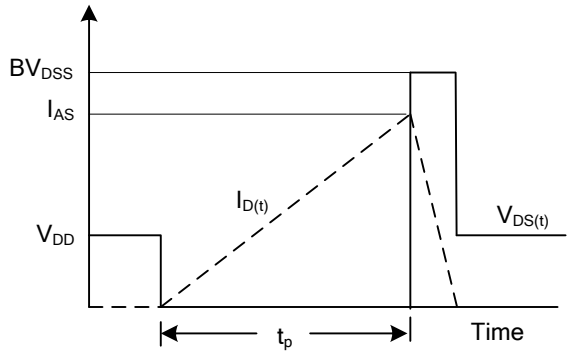
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

■ TYPICAL CHARACTERISTICS

Fig.1 Continuous Drain Current vs. Case Temperature

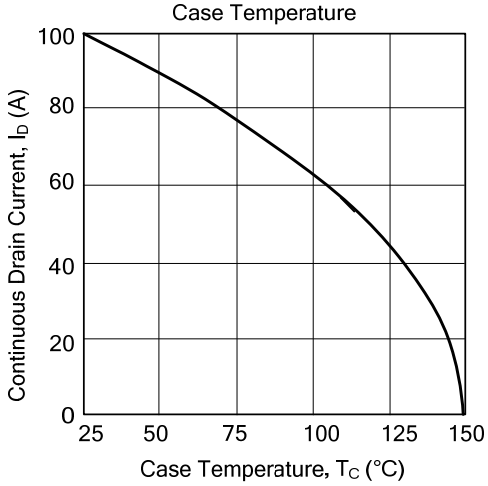


Fig.2 Normalized R_{DSON} vs. Junction Temperature

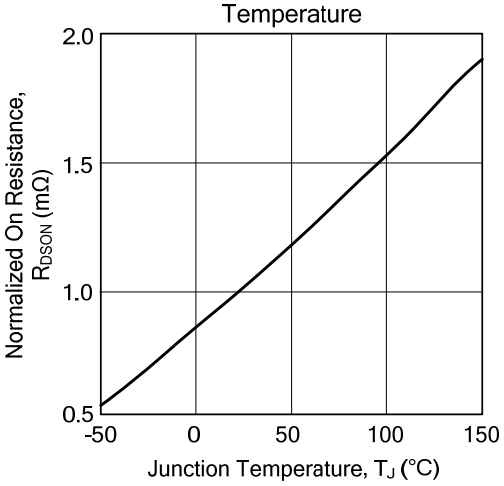


Fig.3 Normalized V_{th} vs. Junction Temperature

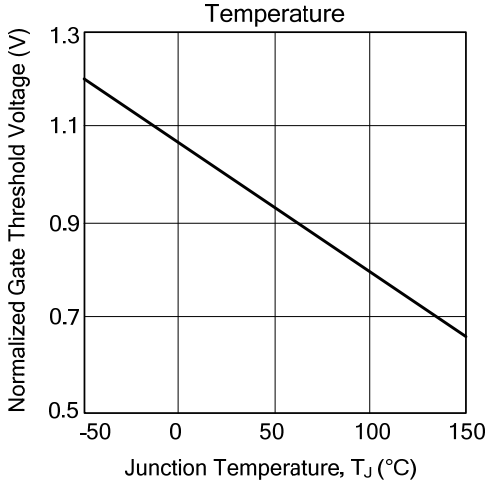


Fig.4 Gate Charge Waveform

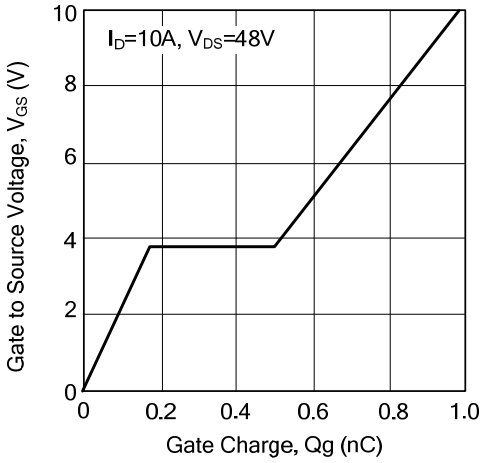


Fig.5 Normalized Transient Impedance

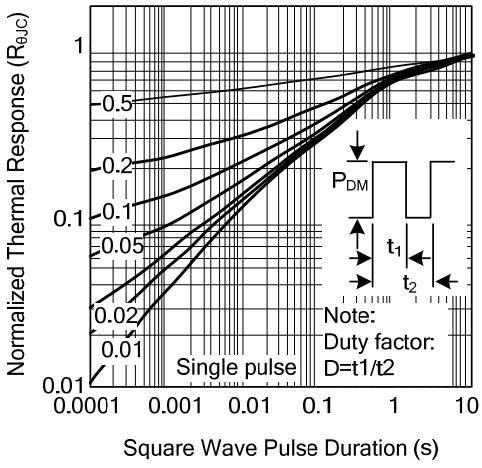


Fig.6 Maximum Safe Operation Area