



N-CHANNEL ENHANCEMENT MODE POWER MOSFET

DESCRIPTION

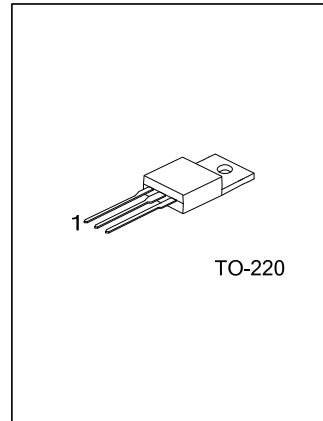
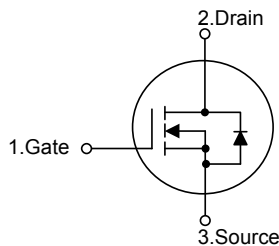
The UTC **UTT150N03** is a N-channel power MOSFET, using UTC's advanced trench technology to provide customers with a minimum on-state resistance, low gate charge and superior switching performance.

The UTC **UTT150N03** is generally applied in DC to DC convertor, synchronous or conventional switching PWM controllers.

FEATURES

- * 150A, 30V, $R_{DS(ON)}=4.1m\Omega$ @ $V_{GS}=10V$, $I_D = 75A$
 $R_{DS(ON)}=4.6m\Omega$ @ $V_{GS}=4.5V$, $I_D = 75A$
- * High Switching Speed
- * High Power and Current Handling Capability
- * RoHS Compliant

SYMBOL



ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTT150N03L-TA3-T	UTT150N03G-TA3-T	TO-220	G	D	S	Tube

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

UTT150N03L-TA3-T	(1)Packing Type	(1) T: Tube
	(2)Package Type	(2) TA3: TO-220
	(3)Lead Free	(3) G: Halogen Free, L: Lead Free

■ ABSOLUTE MAXIMUM RATINGS ($T_C=25^{\circ}\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	± 20	V
Drain Current	Continuous	I_{D}	150	A
	Pulsed	I_{DM}	266	A
Single Pulsed Avalanche Energy (Note 2)		E_{AS}	300	mJ
Power Dissipation	Power Dissipation	P_{D}	160	W
	Derate above 25°C		1.07	$\text{W}/^{\circ}\text{C}$
Junction Temperature		T_{J}	$+150$	$^{\circ}\text{C}$
Storage Temperature		T_{STG}	$-55\sim+150$	$^{\circ}\text{C}$

註解 [U1]: 设计人员根据曲线图得到的 (pulse width=300us)

Note: 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.

■ THERMAL CHARACTERISTICS

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient		θ_{JA}	62	$^{\circ}\text{C}/\text{W}$
Junction to Case		θ_{JC}	0.94	$^{\circ}\text{C}/\text{W}$

■ ELECTRICAL CHARACTERISTICS (T_c=25°C, unless otherwise noted)

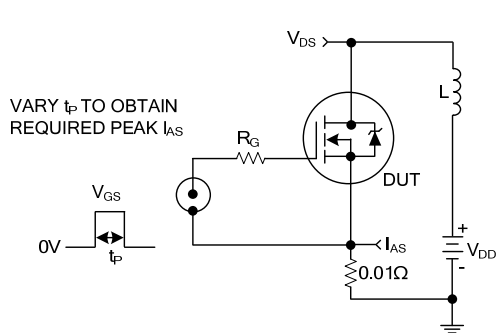
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	I _D =250μA, V _{GS} =0V	30			V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =24V, V _{GS} =0V			1	μA
Gate- Source Leakage	Forward	I _{GSS}	V _{GS} =+20V, V _{DS} =0V			+100	nA
Current	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		3	V
Static Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} =10V, I _D =75A		3.4	4.1	mΩ
Resistance			V _{GS} =4.5V, I _D =75A		4.0	4.6	
DYNAMIC PARAMETERS							
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =15V, f=1.0MHz		5200		pF
Output Capacitance		C _{OSS}			970		pF
Reverse Transfer Capacitance		C _{RSS}			570		pF
SWITCHING PARAMETERS							
Gate Resistance		R _G	V _{GS} =0.5V, f=1MHz		2.1		Ω
Total Gate Charge		Q _{G(TOT)}	V _{GS} =0~10V, V _{DD} =15V, I _D =75A, I _G =1mA		106	132	nC
		Q _{G(5)}	V _{GS} =0~5V, V _{DD} =15V, I _D =75A, I _G =1mA		56	69	nC
Threshold Gate Charge		Q _{G(TH)}	V _{GS} =0~1V, V _{DD} =15V, I _D =75A, I _G =1mA		5.0	6.5	nC
Gate to Source Charge		Q _{GS}	V _{DD} =15V, I _D =75A, I _G =1mA		15		nC
Gate Charge Threshold to Plateau		Q _{GS2}			10		nC
Gate to Drain Charge		Q _{GD}			23		nC
Turn-ON Time		t _{ON}	V _{DD} =15V, I _D =75A, V _{GS} =4.5V, R _{GS} =3.3Ω			168	ns
Turn-ON Delay Time		t _{D(ON)}			11		ns
Rise Time		t _R			105		ns
Turn-OFF Delay Time		t _{D(OFF)}			70		ns
Fall-Time		t _F			46		ns
Turn-OFF Time		t _{OFF}				173	ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Drain-Source Diode Forward Voltage		V _{SD}	I _S =150A			1.25	V
			I _S =15A			1.0	V
Body Diode Reverse Recovery Time		t _{RR}	I _{SD} =150A, dI _{SD} /dt=100A/μs			37	ns
Body Diode Reverse Recovery Charge		Q _{RR}				21	nC

Notes: 1. Package current limitation is 80A.

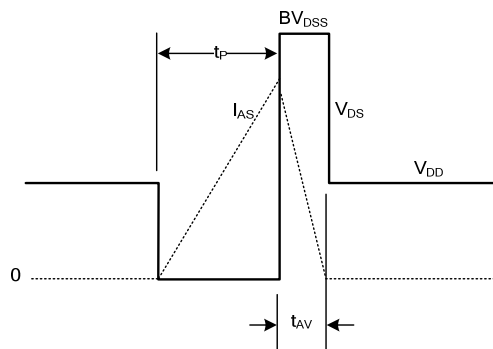
2. Starting T_j = 25°C, L = 0.15mH, I_{AS} = 64A, V_{DD} = 27V, V_{GS}=10V

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

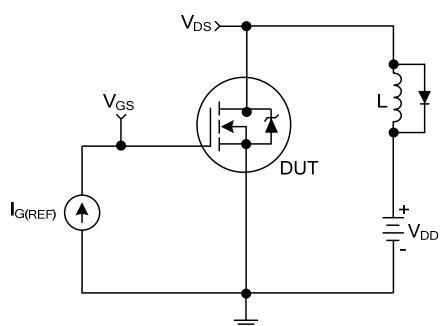
■ TEST CIRCUITS AND WAVEFORMS



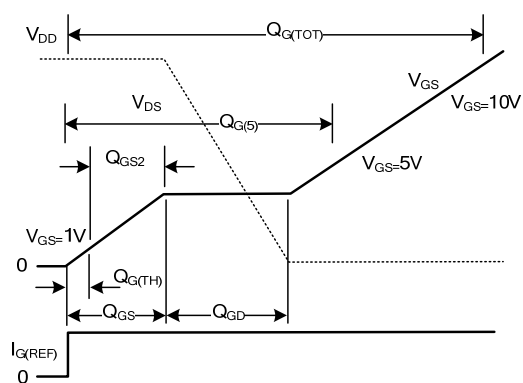
Unclamped Energy Test Circuit



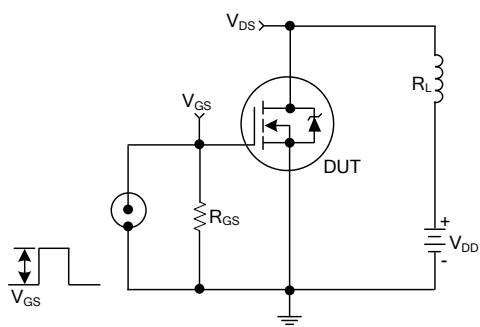
Unclamped Energy Waveforms



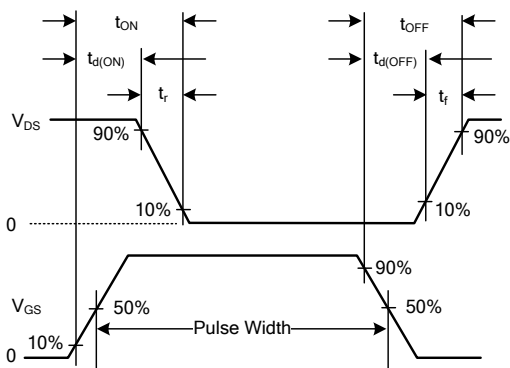
Gate Charge Test Circuit



Gate Charge Waveforms



Switching Time Test Circuit



Switching Time Waveforms



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