

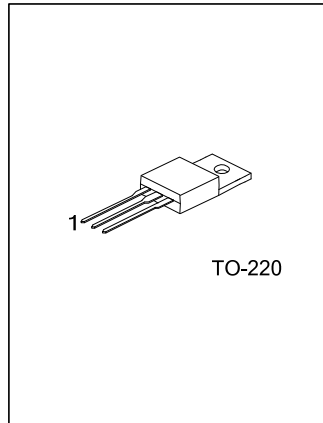


UTT150N03

Preliminary

Power MOSFET

N-CHANNEL ENHANCEMENT MODE POWER MOSFET



DESCRIPTION

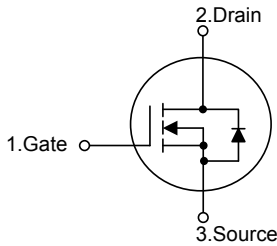
The UTC UTT150N03 is a N-channel power MOSFET, using UTC's advanced trench technology to provide customers with a minimum on-state resistance, low gate charge and superior switching performance.

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

FEATURES

- * 150A, 30V, RDS(ON)=4.1mΩ @ VGS=10V, ID = 75A
RDS(ON)=4.6mΩ @ VGS=4.5V, ID = 75A
* High Switching Speed
* High Power and Current Handling Capability
* RoHS Compliant

SYMBOL



ORDERING INFORMATION

Table with columns: Ordering Number (Lead Free, Halogen Free), Package (TO-220), Pin Assignment (1: G, 2: D, 3: S), Packing (Tube)

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

Table explaining part number UTT150N03L-TA3-T: (1) Packing Type (T: Tube), (2) Package Type (TA3: TO-220), (3) Lead Free (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_{DSS}	30	V
Gate-Source Voltage		V_{GSS}	± 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	W/ $^{\circ}\text{C}$
Junction Temperature		T_J	+150	$^{\circ}\text{C}$
Storage Temperature		T_{STG}	-55~+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	$^{\circ}\text{C/W}$
Junction to Case	θ_{JC}	0.94	$^{\circ}\text{C/W}$

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

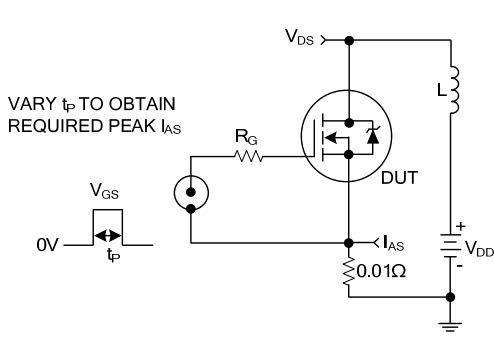
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	I _D =250μA, V _{GS} =0V	30			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =24V, V _{GS} =0V			1	μA
Gate- Source Leakage Current	Forward	I _{GSS}			+100	nA
	Reverse				-100	nA
ON CHARACTERISTICS						
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
		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}				168	ns
Turn-ON Delay Time	t _{D(ON)}			11		ns
Rise Time	t _R	V _{DD} =15V, I _D =75A, V _{GS} =4.5V, R _{GS} =3.3Ω		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.

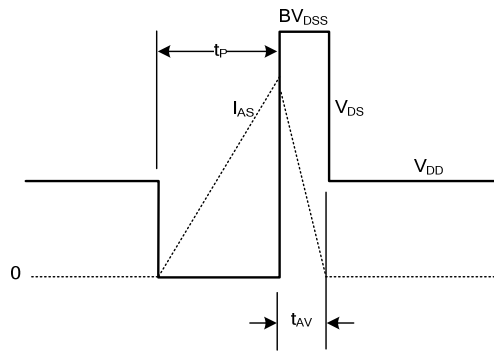
2. Starting T_J = 25°C, L = 0.15mH, I_{AS} = 64A, V_{DD} = 27V, V_{GS}=10V

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

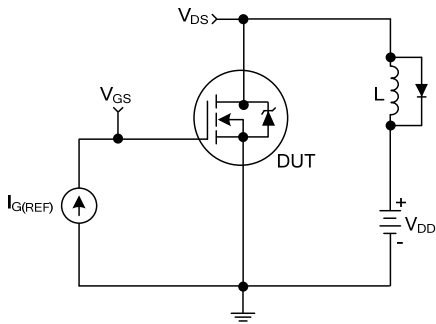
TEST CIRCUITS AND WAVEFORMS



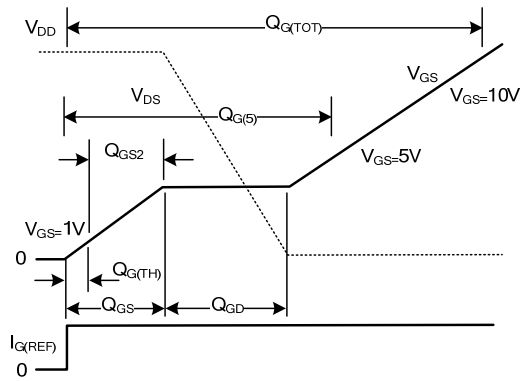
Unclamped Energy Test Circuit



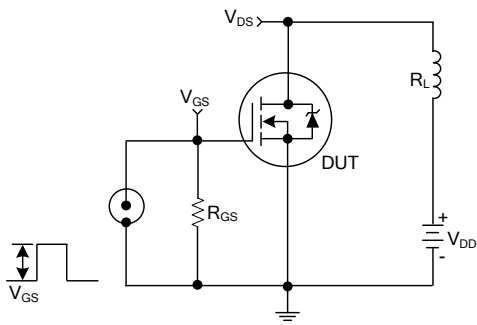
Unclamped Energy Waveforms



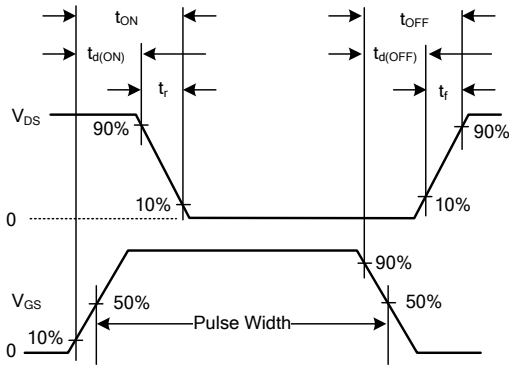
Gate Charge Test Circuit



Gate Charge Waveforms



Switching Time Test Circuit



Switching Time Waveforms



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