



UTT60P03

Preliminary

Power MOSFET

-60A, -30V, P-CHANNEL POWER MOSFETS

DESCRIPTION

The UTC **UTT60P03** is a P-channel power MOSFET using UTC's advanced technology to provide the customers with high switching speed and a minimum on-state resistance and it can also withstand high energy in the avalanche.

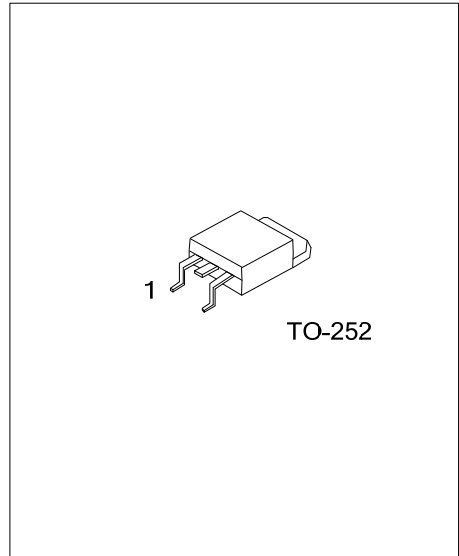
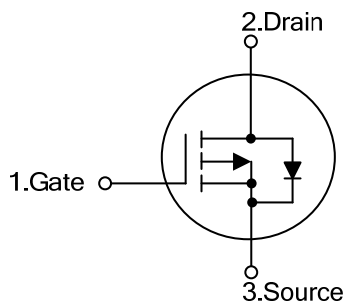
This UTC **UTT60P03** is suitable for switching converters, motor drivers, switching regulators and relay drivers.

FEATURES

* $R_{DS(ON)} < 0.027\Omega$ @ $V_{GS} = -10V$, $I_D = -60A$

* High Switching Speed

SYMBOL



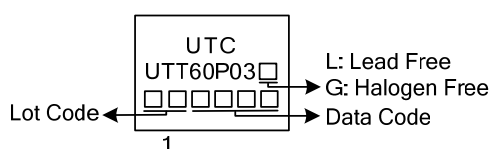
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTT60P03L-TN3-R	UTT60P03G-TN3-R	TO-252	G	D	S	Tape Reel

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

<p>UTT60P03L-TM3-T</p> <p>(1)Packing Type</p> <p>(2)Package Type</p> <p>(3)Green Package</p>	<p>(1) T: Tube, R: Tape Reel</p> <p>(2) TM3: TO-251, TN3: TO-252</p> <p>(3) L: Lead Free, G: Halogen Free and Lead Free</p>
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MARKING



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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage (Note 2)		V _{DSS}	-30	V
Gate-Source Voltage		V _{GSS}	±20	V
Drain Current	Continuous	I _D	-60	A
	Pulsed (Note 2)	I _{DM}	240	A
Power Dissipation		P _D	45	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.

■ THERMAL CHARACTERISTICS

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient		θ _{JA}	110	°C/W
Junction to Case		θ _{JC}	2.73	°C/W

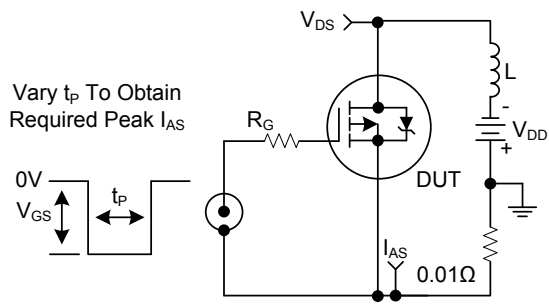
■ ELECTRICAL CHARACTERISTICS (T_c=25°C, unless otherwise specified)

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} =Rated BV _{DSS} , V _{GS} =0V			-1	μA		
			V _{DS} =0.8×Rated BV _{DSS} , T _C =150°C			-50			
Gate- Source Leakage Current	Forward	I _{GSS}	V _{GS} =+20V			+100	nA		
	Reverse		V _{GS} =-20V			-100	nA		
ON CHARACTERISTICS									
Gate Threshold Voltage		V _{GS(TH)}	V _{DS} =V _{GS} , I _D =-250μA	-2		-4	V		
Static Drain-Source On-State Resistance (Note1)		R _{DS(ON)}	V _{GS} =-10V, I _D =-60A			0.027	Ω		
DYNAMIC PARAMETERS									
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =-25V, f=1.0MHz		3000		pF		
Output Capacitance		C _{OSS}				1500		pF	
Reverse Transfer Capacitance		C _{RSS}				525		pF	
SWITCHING PARAMETERS									
Total Gate Charge		Q _G	V _{GS} =0 ~ -20V	V _{DD} =-24V, I _D ≈-60A, R _L =0.4Ω, I _{G(REF)} =-3mA		190	230	nC	
Gate Charge at 10V		Q _{G(-10)}	V _{GS} =0 ~ -10V				100	120	nC
Threshold Gate Charge		Q _{G(TH)}	V _{GS} =0 ~ -2V				7.5	9	nC
Turn-On Time		t _{ON}	V _{DD} =15V, V _{GS} =-10V, I _D ≈60A, R _L =0.25Ω, R _G =2.5Ω				140	ns	
Turn-ON Delay Time		t _{D(ON)}					20	ns	
Rise Time		t _R					75	ns	
Turn-OFF Delay Time		t _{D(OFF)}					35	ns	
Fall-Time		t _F					40	ns	
Turn-Off Time		t _{OFF}						115	ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS									
Drain-Source Diode Forward Voltage (Note)		V _{SD}	I _{SD} =-60A			-1.75	V		
Body Diode Reverse Recovery Time		t _{RR}	I _{SD} =-60A, I _{SD} /dt=100A/μs			200	ns		

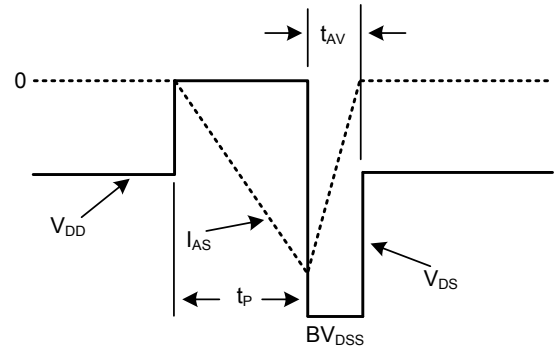
Notes: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%.

2. Essentially independent of operating temperature.

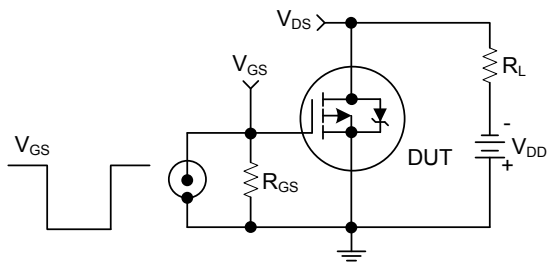
TEST CIRCUITS AND WAVEFORMS



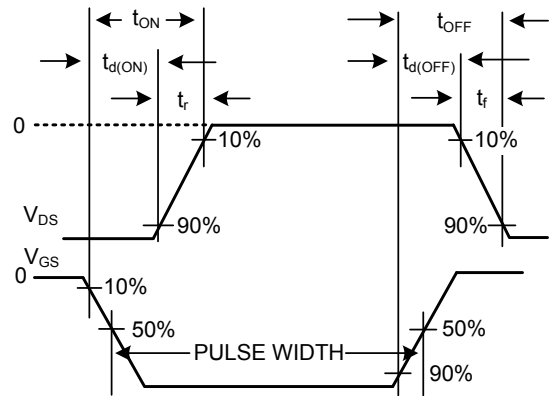
Unclamped Energy Test Circuit



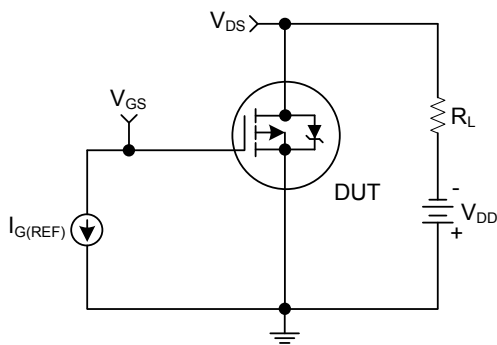
Unclamped Energy Waveform



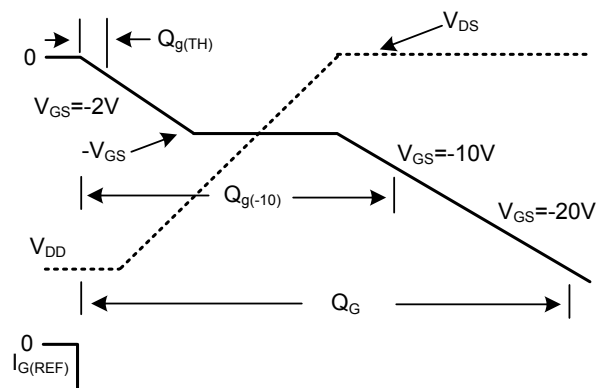
Switching Time Test Circuit



Resistive Switching Waveforms



Gate Charge Test Circuit



Gate Charge Waveforms

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