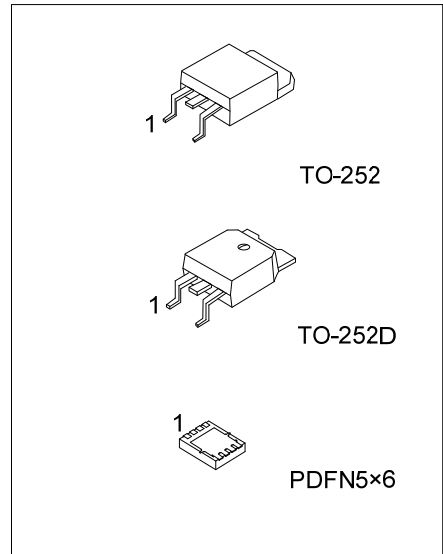




# UTT75N03

## POWER MOSFET

### 75A, 30V, N-CHANNEL ENHANCEMENT MODE POWER MOSFET



■ DESCRIPTION

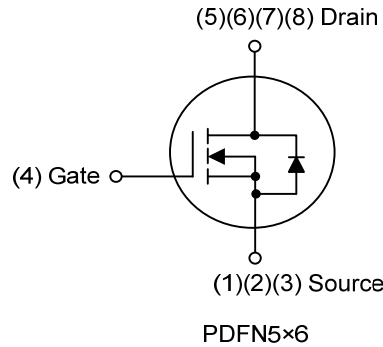
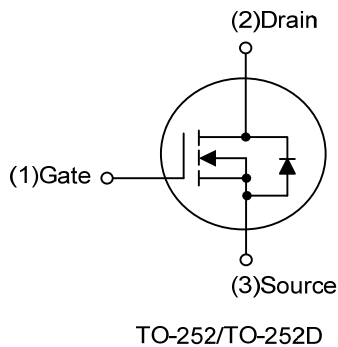
The UTC **UTT75N03** is a N-channel enhancement mode Power MOSFET, it uses UTC's advanced technology to provide the customers with high switching and a minimum on-state resistance.

The UTC **UTT75N03** is suitable for low voltage applications such as DC/DC converters.

■ FEATURES

- \*  $R_{DS(ON)} \leq 4.0\ m\Omega$  @  $V_{GS}=10V, I_D=40A$
- $R_{DS(ON)} \leq 7.0\ m\Omega$  @  $V_{GS}=4.5V, I_D=30A$
- \* Low on-resistance

■ SYMBOL



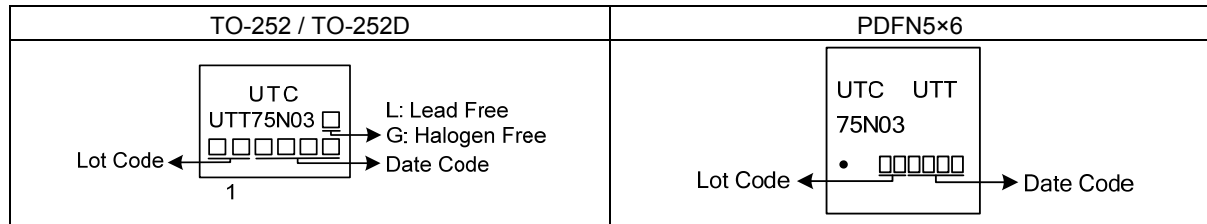
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UTT75N03L-TN3-R	UTT75N03G-TN3-R	TO-252	G	D	S	-	-	-	-	-	Tape Reel
UTT75N03L-TND-R	UTT75N03G-TND-R	TO-252D	G	D	S	-	-	-	-	-	Tape Reel
UTT75N03L-P5060-R	UTT75N03G-P5060-R	PDFN5x6	S	S	S	G	D	D	D	D	Tape Reel

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

<p>UTT75N03G-TN3-R</p>	<p>(1) R: Tape Reel</p> <p>(2) TN3: TO-252, TND: TO-252D, P5060: PDFN5x6</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
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## MARKING



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

PARAMETER		SYMBOL	RATINGS	UNIT	
Drain-Source Voltage		$V_{DSS}$	30	V	
Gate-Source Voltage		$V_{GSS}$	$\pm 20$	V	
Drain Current	Continuous	TO-252	75	A	
		TO-252D			
	PDFN5x6		40	A	
	Pulsed (Note 2)	TO-252	300	A	
TO-252D					
PDFN5x6		160			A
Avalanche Energy		Single Pulsed (Note 3)	$E_{AS}$	125	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	12	V/ns	
Total Power Dissipation	TO-252/TO-252D		$P_D$	50	W
	PDFN5x6			35	W
Operating Junction Temperature Range		$T_J$	-55 ~ +150	$^\circ\text{C}$	
Storage Temperature Range		$T_{STG}$	-55 ~ +150	$^\circ\text{C}$	

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. Pulse width limited by max. junction temperature.

3.  $L=0.1\text{mH}$ ,  $I_{AS}=50\text{A}$ ,  $V_{DD}=25\text{V}$ ,  $R_G=25\Omega$ , Starting  $T_J = 25^\circ\text{C}$ .

4.  $I_{SD} \leq 30\text{A}$ ,  $di/dt \leq 200\text{A}/\mu\text{s}$ ,  $V_{DD} \leq V_{(BR)DSS}$ ,  $T_J = 25^\circ\text{C}$ .

■ THERMAL RESISTANCE

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient (PCB Mount) (Note)	TO-252	$\theta_{JA}$	62.5	$^\circ\text{C}/\text{W}$
	TO-252D			
	PDFN5x6			
Junction to Case	TO-252	$\theta_{JC}$	2.5	$^\circ\text{C}/\text{W}$
	TO-252D			
	PDFN5x6			

Note: Surface mounted on 1 in<sup>2</sup> copper pad of FR4 board.

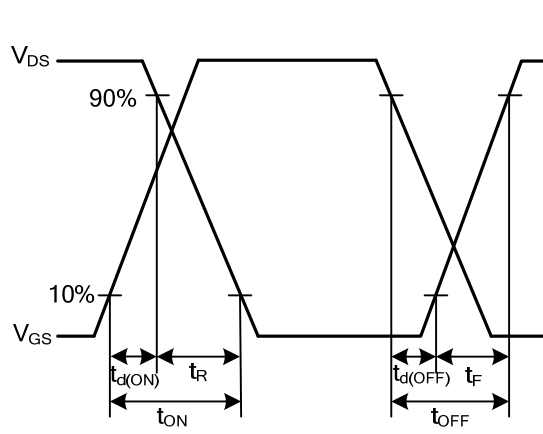
■ ELECTRICAL CHARACTERISTICS (T<sub>J</sub>=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	I <sub>D</sub> =250μA, V <sub>GS</sub> =0V	30			V
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V			10	μA
Gate-Source Leakage Current	Forward	V <sub>GS</sub> =20V, V <sub>DS</sub> =0V			+100	nA
	Reverse	V <sub>GS</sub> =-20V, V <sub>DS</sub> =0V			-100	nA
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1.0		3.0	V
Static Drain-Source On-State Resistance (Note)	R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =40A			4.0	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =30A			7.0	mΩ
<b>DYNAMIC PARAMETERS</b>						
Input Capacitance	C <sub>ISS</sub>	V <sub>DS</sub> =15V, V <sub>GS</sub> =0V, f=1.0MHz		4350		pF
Output Capacitance	C <sub>OSS</sub>			850		pF
Reverse Transfer Capacitance	C <sub>RSS</sub>			630		pF
<b>SWITCHING PARAMETERS</b>						
Total Gate Charge (Note 1)	Q <sub>G</sub>	V <sub>DS</sub> =24V, V <sub>GS</sub> =10V, I <sub>D</sub> =60A I <sub>G</sub> =1mA (Note 1, 2)		102		nC
Gate to Source Charge	Q <sub>GS</sub>			22		nC
Gate to Drain Charge	Q <sub>GD</sub>			24		nC
Turn-ON Delay Time (Note 1)	t <sub>D(ON)</sub>	V <sub>DS</sub> =15V, V <sub>GS</sub> =10V, I <sub>D</sub> =60A R <sub>G</sub> =25Ω		26		ns
Rise Time	t <sub>R</sub>			88		ns
Turn-OFF Delay Time	t <sub>D(OFF)</sub>			250		ns
Fall Time	t <sub>F</sub>			190		ns
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
Maximum Body-Diode Pulsed Current	I <sub>S</sub>				75	A
Drain-Source Diode Forward Voltage (Note 1)	I <sub>SM</sub>				300	A
Forward On Voltage (Note 1)	V <sub>SD</sub>	I <sub>S</sub> =75A, V <sub>GS</sub> =0V			1.2	V
Reverse Recovery Time (Note 1)	t <sub>rr</sub>	I <sub>S</sub> =30A, V <sub>GS</sub> =0V, dI <sub>F</sub> /dt=100A/μs		240		ns
Reverse Recovery Charge	Q <sub>rr</sub>				0.68	

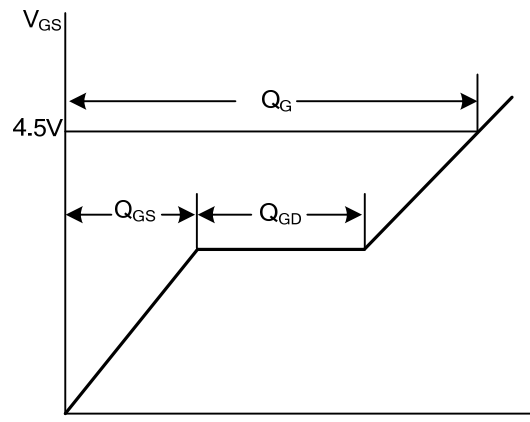
Note: 1. Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2%.

2. Essentially independent of operating temperature.

## ■ TEST CIRCUITS AND WAVEFORMS

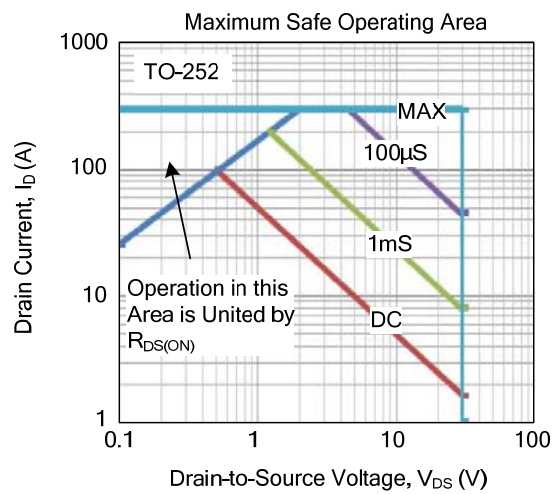
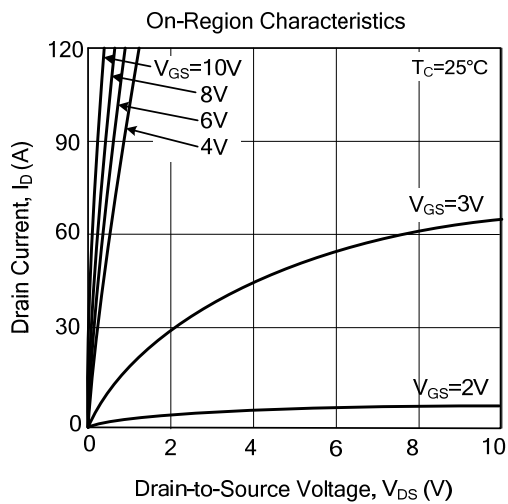
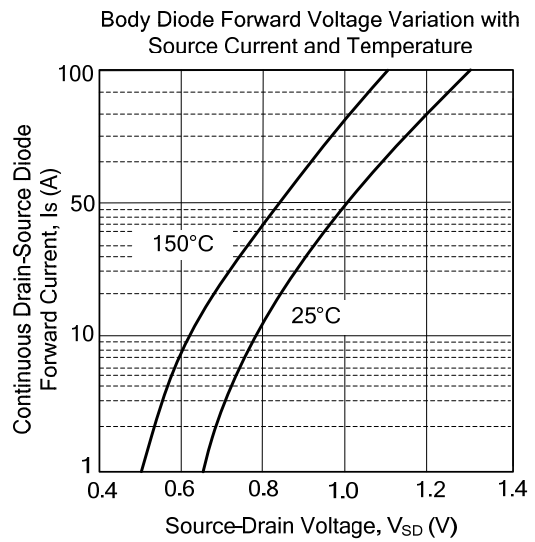
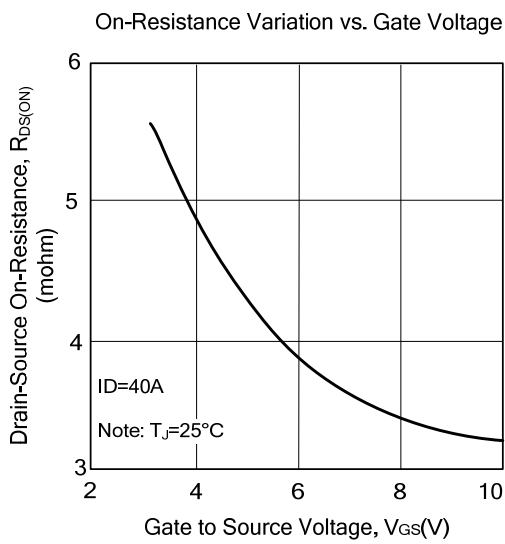
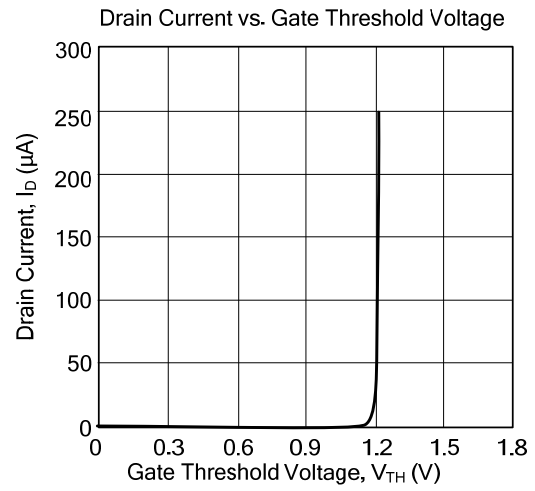
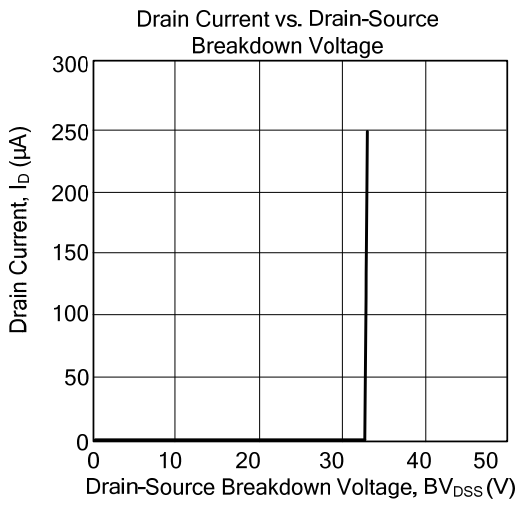


Resistive Switching Waveforms

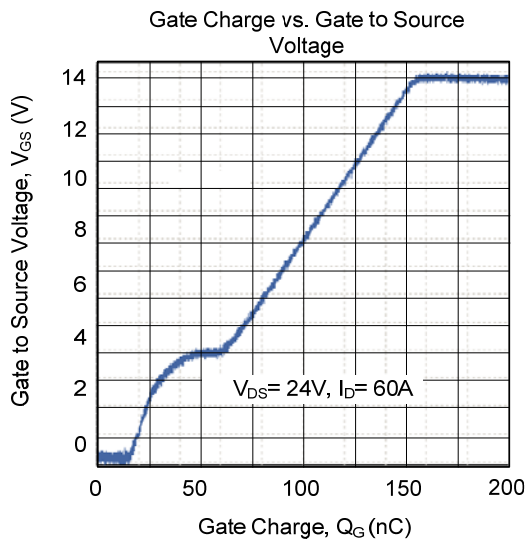
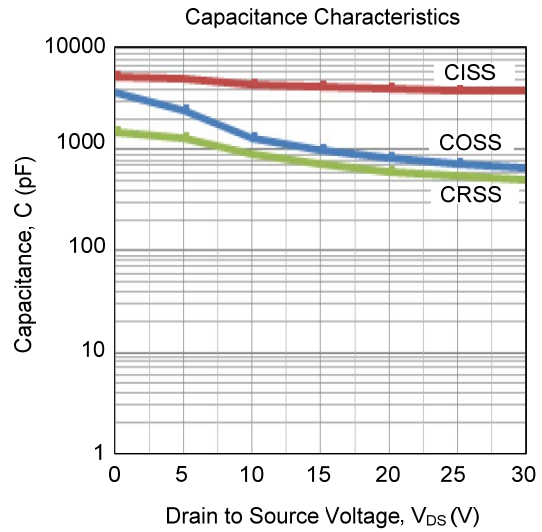
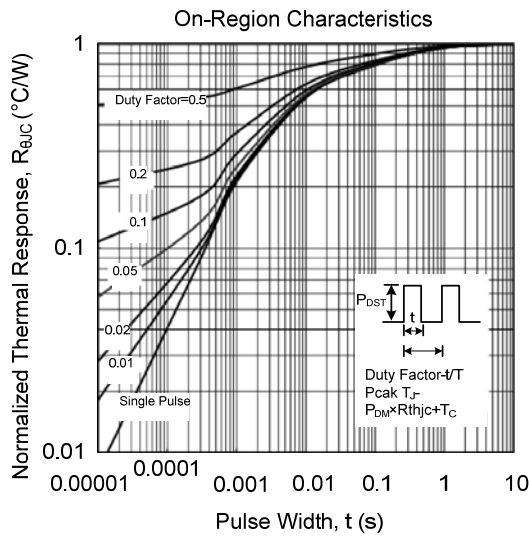


Charge  
Gate Charge Waveforms

## TYPICAL CHARACTERISTICS



## TYPICAL CHARACTERISTICS



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