



## UT100N03

Power MOSFET

### 100A, 30V N-CHANNEL POWER MOSFET

#### DESCRIPTION

The **UT100N03** uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with low gate voltages. This device is suitable for use as a load switch or in PWM applications.

#### FEATURES

##### TO-220

- \*  $R_{DS(ON)} \leq 4.6 \text{ m}\Omega$  @  $V_{GS}=10 \text{ V}$ ,  $I_D=50 \text{ A}$
- \*  $R_{DS(ON)} \leq 6.0 \text{ m}\Omega$  @  $V_{GS}=4.5 \text{ V}$ ,  $I_D=40 \text{ A}$

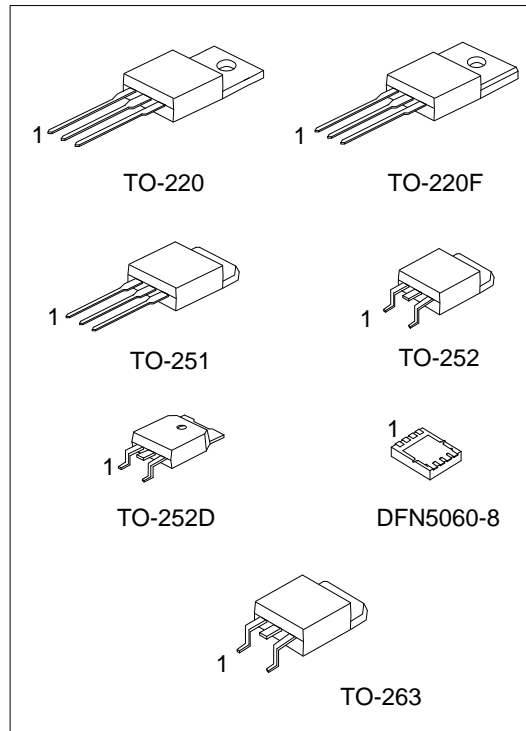
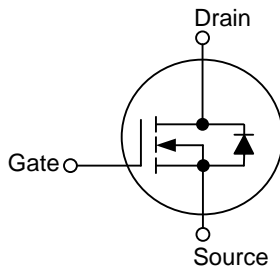
##### TO-220F/TO-251/TO-252/TO-252D/TO-263

- \*  $R_{DS(ON)} \leq 5.3 \text{ m}\Omega$  @  $V_{GS}=10 \text{ V}$ ,  $I_D=50 \text{ A}$
- \*  $R_{DS(ON)} \leq 8.0 \text{ m}\Omega$  @  $V_{GS}=4.5 \text{ V}$ ,  $I_D=40 \text{ A}$

##### DFN5060-8

- \*  $R_{DS(ON)} \leq 4.0 \text{ m}\Omega$  @  $V_{GS}=10 \text{ V}$ ,  $I_D=50 \text{ A}$
- \*  $R_{DS(ON)} \leq 5.8 \text{ m}\Omega$  @  $V_{GS}=4.5 \text{ V}$ ,  $I_D=40 \text{ A}$

#### SYMBOL



### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UT100N03L-TA3-T	UT100N03G-TA3-T	TO-220	G	D	S	-	-	-	-	-	Tube
UT100N03L-TF3-T	UT100N03G-TF3-T	TO-220F	G	D	S	-	-	-	-	-	Tube
UT100N03L-TM3-T	UT100N03G-TM3-T	TO-251	G	D	S	-	-	-	-	-	Tube
UT100N03L-TN3-R	UT100N03G-TN3-R	TO-252	G	D	S	-	-	-	-	-	Tape Reel
UT100N03L-TND-R	UT100N03G-TND-R	TO-252D	G	D	S	-	-	-	-	-	Tape Reel
UT100N03L-TQ2-T	UT100N03G-TQ2-T	TO-263	G	D	S	-	-	-	-	-	Tube
UT100N03L-TQ2-R	UT100N03G-TQ2-R	TO-263	G	D	S	-	-	-	-	-	Tape Reel
UT100N03L-K08-5060-R	UT100N03G-K08-5060-R	DFN5060-8	S	S	S	G	D	D	D	D	Tape Reel

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

<p>UT100N03G-TA3-T</p> <p>(1) Packing Type (2) Package Type (3) Green Package</p>	<p>(1) T: Tube, R: Tape Reel (2) TA3: TO-220, TF3: TO-220F, TM3: TO-251, TN3: TO-252, TND: TO-252D, TQ2: TO-263, K08-5060: DFN5060-8 (3) G: Halogen Free and Lead Free, L: Lead Free</p>
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### MARKING

TO-220 / TO-220F / TO-251 TO-252 / TO-252D / TO-263	DFN5060-8
<p>UTC UT100N03 □□□□□ L: Lead Free G: Halogen Free Date Code Lot Code</p> <p>1</p>	<p>UTC UT 100N03 • □□□□□ Date Code Lot Code</p>

### ■ ABSOLUTE MAXIMUM RATINGS (T<sub>C</sub> = 25°C, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	V <sub>DSS</sub>	30	V
Gate-Source Voltage	V <sub>GSS</sub>	±20	V
Continuous Drain Current	I <sub>D</sub>	100	A
Pulsed Drain Current (Note 2)	I <sub>DM</sub>	400	A
Single Pulsed Avalanche Current (Note 3)	I <sub>AS</sub>	35	A
Single Pulsed Avalanche Energy (Note 3)	E <sub>AS</sub>	875	mJ
Power Dissipation	TO-220/TO-263	100	W
	TO-220F	36	W
	TO-251/TO-252 TO-252D	50	W
	DFN5060-8	21	W
		P <sub>D</sub>	
Junction Temperature	T <sub>J</sub>	+175	°C
Strong Temperature	T <sub>STG</sub>	-55 ~ +175	°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 maximum junction temperature

3. L = 0.5mH, I<sub>AS</sub> = 35A, V<sub>DD</sub> = 25V, R<sub>G</sub> = 25Ω, Starting T<sub>J</sub> = 25°C.

### ■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220/TO-220F TO-263	62.5	°C/W
	TO-251/TO-252 TO-252D	110	°C/W
	DFN5060-8	40.3 (Note 1, 2)	°C/W
Junction to Case	TO-220/TO-263	1.5	°C/W
	TO-220F	3.47	°C/W
	TO-251/TO-252 TO-252D	3	°C/W
	DFN5060-8	6 (Note 1, 2)	°C/W
		θ <sub>JC</sub>	

Notes: 1. Maximum under Steady State conditions is 90 °C/W.

2. Surface Mounted on 1" x 1" FR4 board.

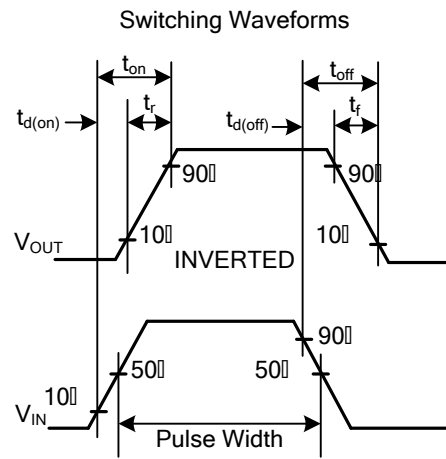
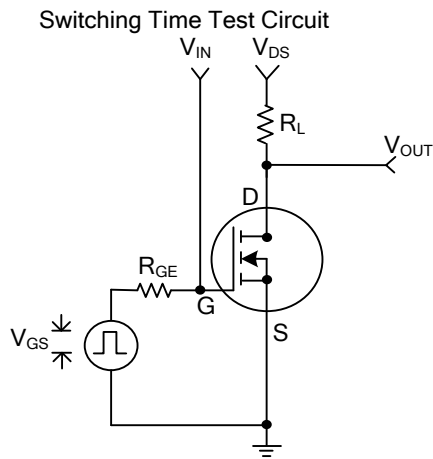
### ■ ELECTRICAL CHARACTERISTICS (T<sub>J</sub> =25°C, unless otherwise noted)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>							
Drain-Source Breakdown Voltage		BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	30			V
Drain-Source Leakage Current		I <sub>DSS</sub>	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V			1	μA
Gate-Source Leakage Current		I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V			±100	nA
<b>ON CHARACTERISTICS(Note2)</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-Resistance	TO-220	R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =50A		3.6	4.6	mΩ
			V <sub>GS</sub> =4.5V, I <sub>D</sub> =40A		4.4	6.0	mΩ
	TO-220F TO-251 TO-252 TO-252D TO-263		V <sub>GS</sub> =10V, I <sub>D</sub> =50A		3.05	5.3	mΩ
			V <sub>GS</sub> =4.5V, I <sub>D</sub> =40A		4.2	8.0	mΩ
	DFN5060-8		V <sub>GS</sub> =10V, I <sub>D</sub> =50A		3.0	4.0	mΩ
			V <sub>GS</sub> =4.5V, I <sub>D</sub> =40A		4.2	5.8	mΩ
<b>DYNAMIC PARAMETERS(Note3)</b>							
Input Capacitance	C <sub>ISS</sub>	V <sub>DS</sub> =15V, V <sub>GS</sub> =0V, f=1.0MHz		4900		pF	
Output Capacitance	C <sub>OSS</sub>			1040			
Reverse Transfer Capacitance	C <sub>RSS</sub>			900			
<b>SWITCHING PARAMETERS(Note3)</b>							
Total Gate Charge	Q <sub>G</sub>	V <sub>DS</sub> =15V, V <sub>GS</sub> =5V, I <sub>D</sub> =16A		65		nC	
Gate Source Charge	Q <sub>GS</sub>			10			
Gate Drain Charge	Q <sub>GD</sub>			27			
Turn-ON Delay Time	t <sub>D(ON)</sub>	V <sub>DD</sub> =15V, I <sub>D</sub> =16A, R <sub>G</sub> =6Ω V <sub>GS</sub> =10V		40		ns	
Turn-ON Rise Time	t <sub>R</sub>			37			
Turn-OFF Delay Time	t <sub>D(OFF)</sub>			132			
Turn-OFF Fall-Time	t <sub>F</sub>			65			
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>							
Drain-Source Diode Forward Current	I <sub>S</sub>				90	A	
Maximum Body-Diode Pulsed Current	I <sub>SM</sub>				180	A	
Drain-Source Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =20A, V <sub>GS</sub> =0V			1.5	V	

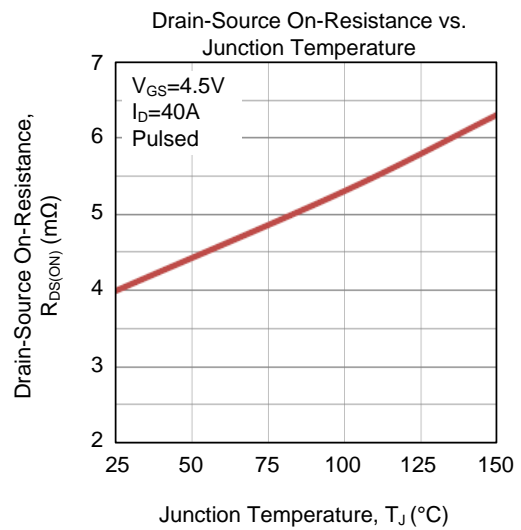
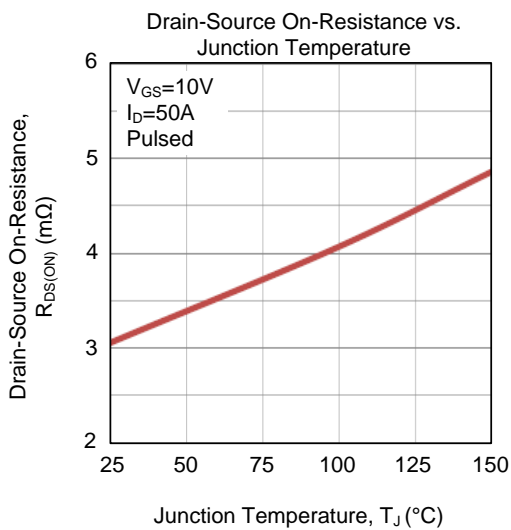
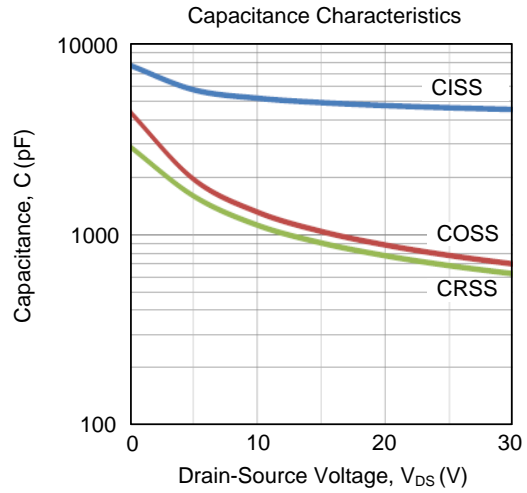
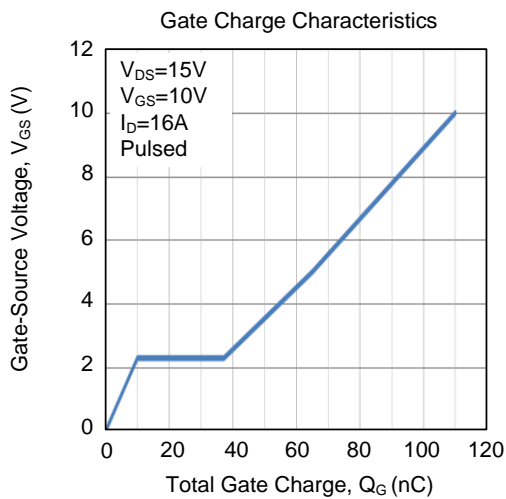
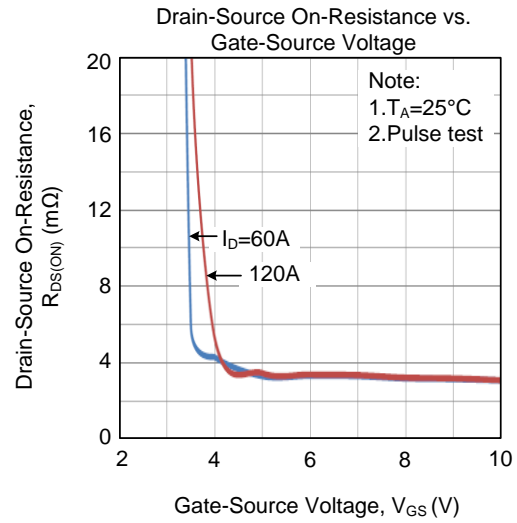
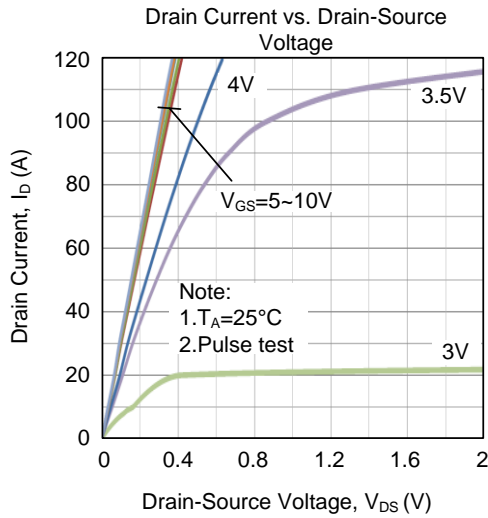
Notes: 1. Pulse Test : Pulse Width < 300μs, Duty Cycle < 2%.

2. Guaranteed by design, not subject to production testing.

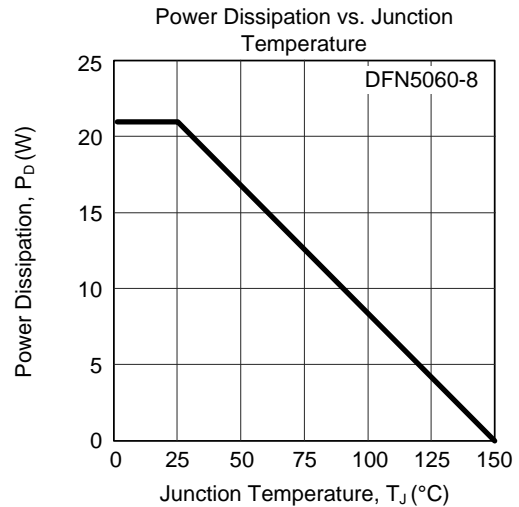
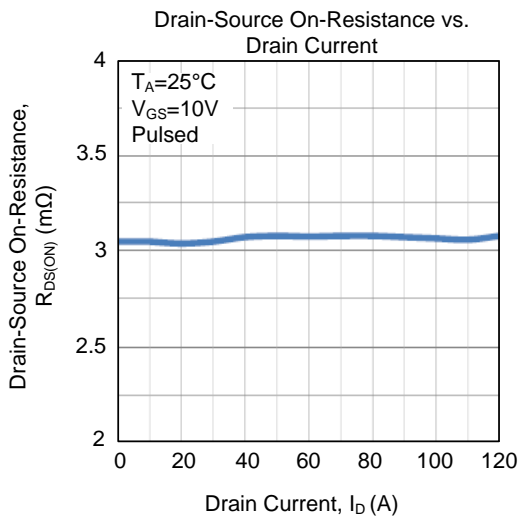
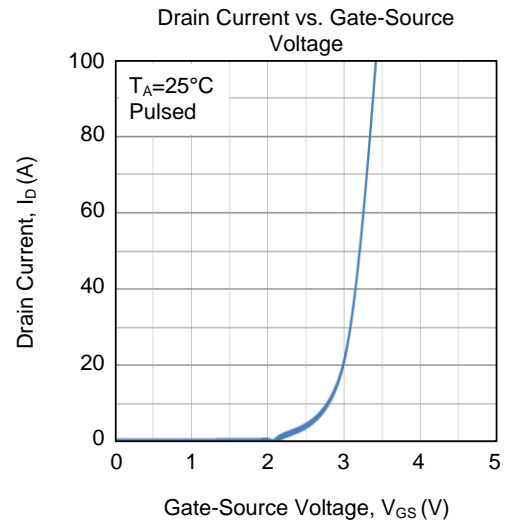
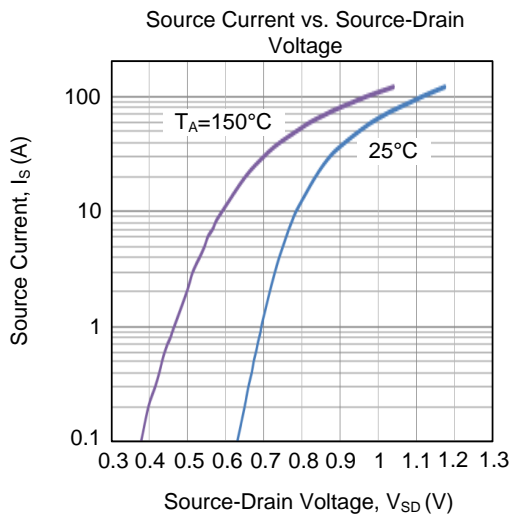
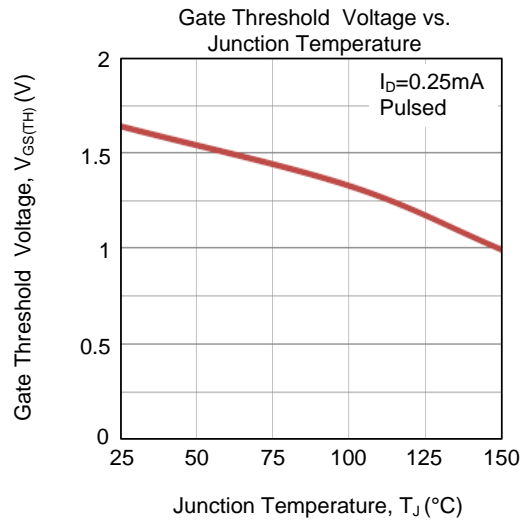
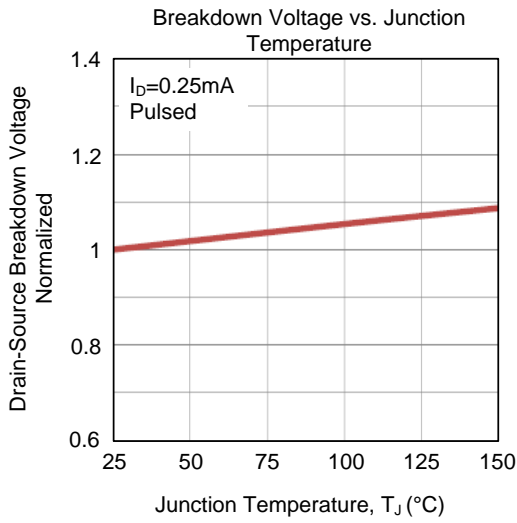
■ TEST CIRCUIT AND WAVEFORM



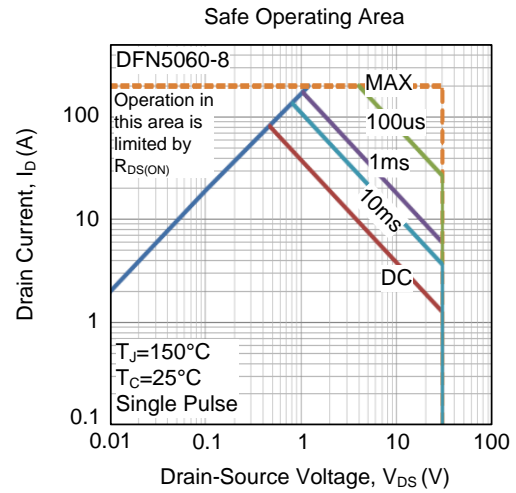
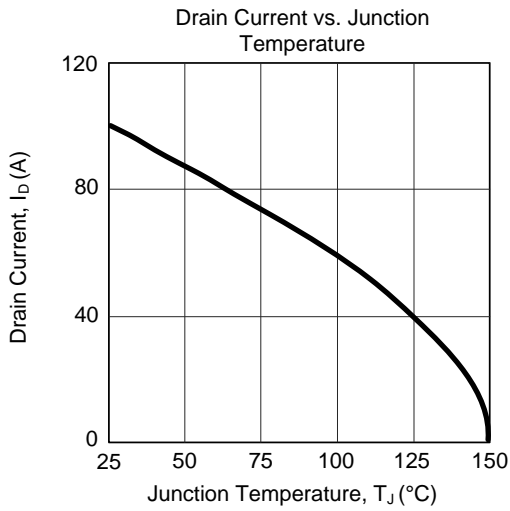
## ■ TYPICAL CHARACTERISTICS



## ■ TYPICAL CHARACTERISTICS (Cont.)



■ **TYPICAL CHARACTERISTICS (Cont.)**



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