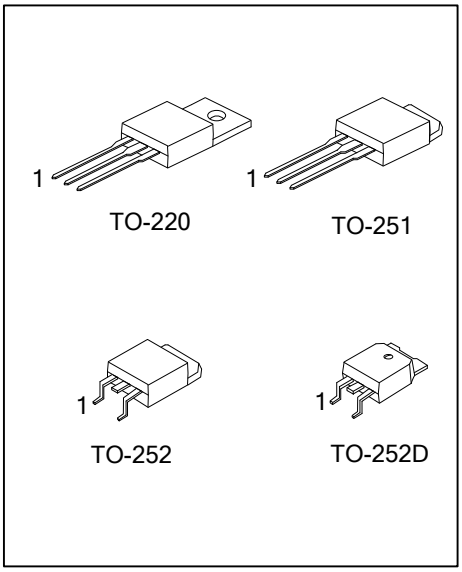
UT60N03

Power MOSFET

30V, 60A N-CHANNEL LOGIC LEVEL MOSFET



■ DESCRIPTION

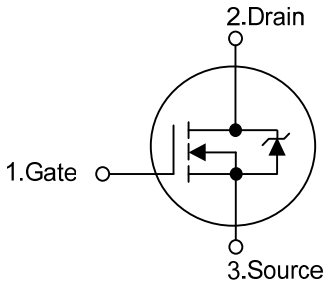
This device employs advanced MOSFET technology and features low gate charge while maintaining low on-resistance.

Optimized for switching applications, this device improves the overall efficiency of DC/DC converters and allows operation to higher switching frequencies.

■ FEATURES

* $R_{DS(ON)}$ < 23mΩ @ V_{GS}=10V, I_D=30A
* $R_{DS(ON)}$ < 30mΩ @ V_{GS}=4.5V, I_D=19A
* Low Capacitance
* Low Gate Charge
* Fast Switching Capability
* Avalanche Energy Specified

■ SYMBOL



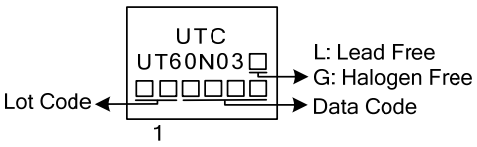
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UT60N03L-TA3-T	UT60N03G-TA3-T	TO-220	G	D	S	Tube
UT60N03L-TM3-T	UT60N03G-TM3-T	TO-251	G	D	S	Tube
UT60N03L-TN3-R	UT60N03G-TN3-R	TO-252	G	D	S	Tape Reel
UT60N03L-TND-R	UT60N03G-TND-R	TO-252D	G	D	S	Tape Reel

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

UT60N03L-TA3-R (1)Packing Type (2)Package Type (3)Green Package	(1) R: Tape Reel, T: Tube (2) TA3: TO-220, TM3: TO-251, TN3: TO-252 (3) L: Lead Free, G: Halogen Free and Lead Free

■ MARKING



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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	30	V
Gate-Source Voltage		V_{GSS}	±20	V
Continuous Drain Current (V_{GS}=10V)		I_D	60	A
Power Dissipation	TO-220	P_D	60	W
	TO-251/TO-252		45	
Derate above 25°C	TO-220		0.4	W/°C
	TO-251/TO-252		0.37	
Junction Temperature		T_J	+150	°C
Storage Temperature		T_{STG}	-55 ~ +150	°C

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 RESISTANCES CHARACTERISTICS

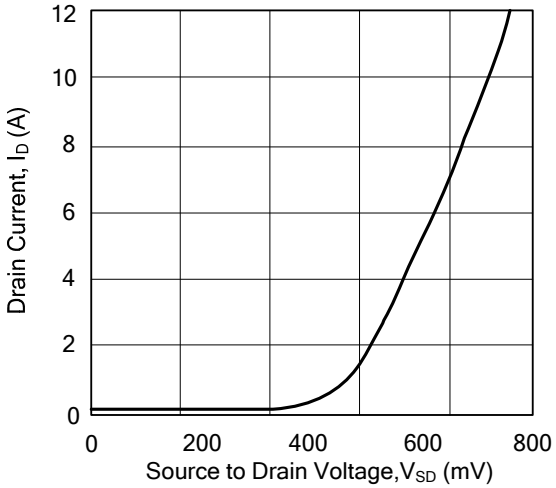
PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220	θ_{JA}	62.5	°C/W
	TO-251/TO-252		100	
Junction to Case	TO-220	θ_{JC}	2.5	°C/W
	TO-251/TO-252		2.73	

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

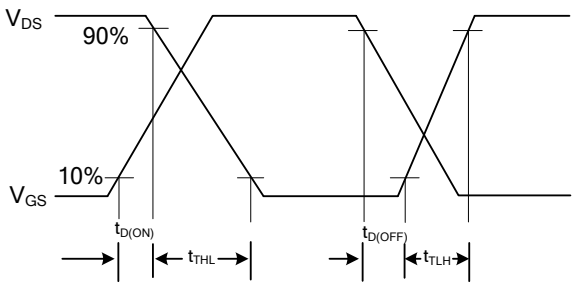
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250μA	30			V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=25V, V_{GS}=0V			1	μA
Gate-Source Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±20V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250μA	1		3	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=30A		14	23	mΩ
		V_{GS}=4.5V, I_D=19A		24	30	
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	V_{DS}=15V, V_{GS}=0V, f=1MHz		900		pF
Output Capacitance	C_{OSS}			210		pF
Reverse Transfer Capacitance	C_{RSS}			90		pF
SWITCHING PARAMETERS						
Turn-ON Time	$t_{(ON)}$	V_{DD}=15V, I_D=7.9A, R_L=18Ω, V_{GS}=4.5V			90	ns
Turn-ON Delay Time	$t_{D(ON)}$			11		ns
Turn-ON Rise Time	t_R			49		ns
Turn-OFF Time	$t_{(OFF)}$				83	ns
Turn-OFF Delay Time	$t_{D(OFF)}$			27		ns
Turn-OFF Fall-Time	t_F			28		ns
Turn-ON Time	$t_{(ON)}$	V_{DD}=15V, I_D=7.9A, R_L=18Ω, V_{GS}=10V			48	ns
Turn-ON Delay Time	$t_{D(ON)}$			6		ns
Turn-ON Rise Time	t_R			26		ns
Turn-OFF Time	$t_{(OFF)}$				120	ns
Turn-OFF Delay Time	$t_{D(OFF)}$			52		ns
Turn-OFF Fall-Time	t_F			28		ns
Total Gate Charge 5V	Q_G	V_{GS}=0V~5V,V_{DD}=15V,I_D=19A I_G=1.0mA		18	28	nC
Total Gate Charge 10V		V_{GS}=0V~10V,V_{DD}=15V,I_D=19A,I_G=1.0mA		9.6	14	
Threshold Gate Charge	$Q_{G(TH)}$	V_{GS}=0V~1V,V_{DD}=15V,I_D=19A I_G=1.0mA		1.0	1.5	nC
Gate-Source Charge	Q_{GS}	V_{DD}=15V, I_D=19A I_G=1.0mA		3.4		nC
Gate-Drain Charge	Q_{GD}			3.4		nC
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage	V_{SD}	I_{SD}=19A			1.25	V
		I_{SD}=10A			1.0	
Reverse Recovery Time	t_{rr}	I_{SD}=9A, dI_S/dt =100A/s,			58	ns
Reverse Recovery Charge	Q_{RR}				70	nC

■ TYPICAL CHARACTERISTICS

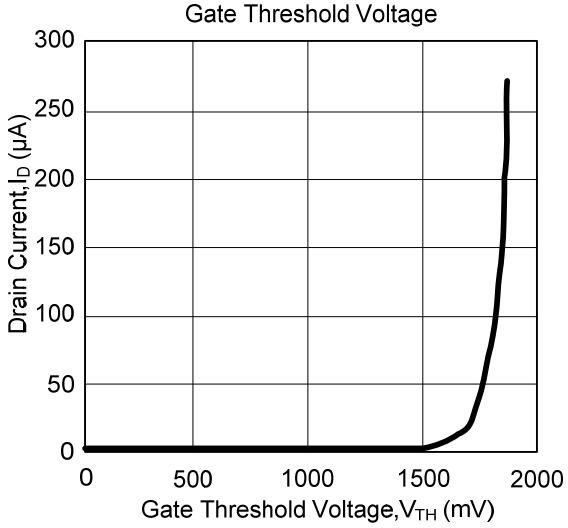
Drain Current vs. Source to Drain Voltage



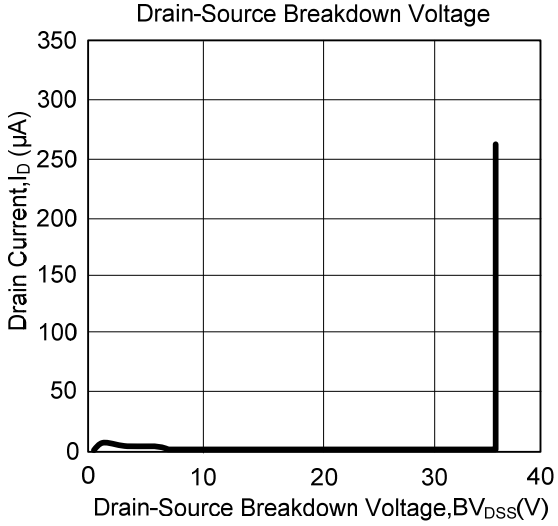
Switching Time Waveforms



Drain Current vs.
Gate Threshold Voltage



Drain Current vs.
Drain-Source Breakdown Voltage



Drain-Source On-State
Resistance Characteristics