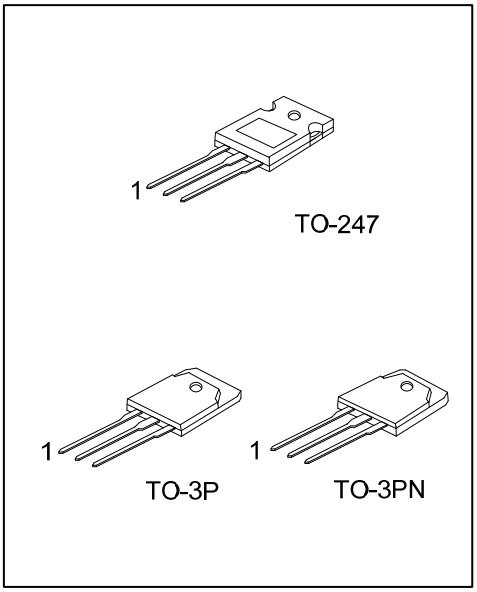
18A, 600V N-CHANNEL POWER MOSFET



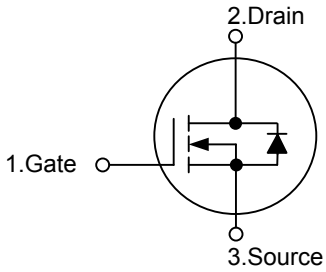
■ DESCRIPTION

The UTC **18N60** uses UTC's advanced proprietary, planar stripe, DMOS 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

* $R_{DS(ON)} \leq 0.5\ \Omega$ @ V_{GS}=10V, I_D=9.0A
* Fast Switching Capability
* Avalanche Energy Specified
* Improved dv/dt Capability, High Ruggedness

■ SYMBOL



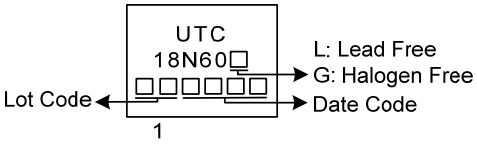
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
18N60L-T3P-T	18N60G-T3P-T	TO-3P	G	D	S	Tube
18N60L-T3N-T	18N60G-T3N-T	TO-3PN	G	D	S	Tube
18N60L-T47-T	18N60G-T47-T	TO-247	G	D	S	Tube

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

18N60G-T3P-T (1)Packing Type (2)Package Type (3)Green Package	(1) T: Tube (2) T3P: TO-3P, T3N: TO-3PN, T47: TO-247 (3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	600	V
Gate-Source Voltage		V_{GSS}	±30	V
Continuous Drain Current		I_D	18	A
Pulsed Drain Current		I_{DM}	45	A
Avalanche Current		I_{AR}	18	A
Avalanche Energy	Single Pulsed	E_{AS}	506 (Note 2)	mJ
Peak Diode Recovery dv/dt		dv/dt	3.35	V/ns
Power Dissipation	TO-247	P_D	360	W
	TO-3P/TO-3PN		395	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. L=6.18mH, I_{AS}=12.8A, V_{DD}=50V, R_G=25Ω, Starting T_J=25°C

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-247	θ_{JA}	40	°C/W
	TO-3P/TO-3PN		30	
Junction to Case	TO-247	θ_{jC}	0.35	°C/W
	TO-3P/TO-3PN		0.32	

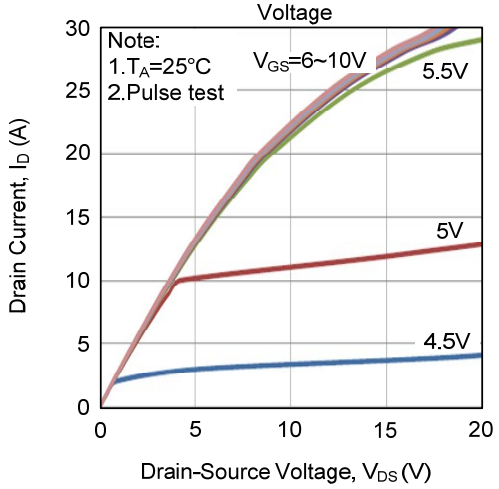
■ ELECTRICAL CHARACTERISTICS (T_J =25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250μA	600			V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=600V, V_{GS}=0V			25	μA
Gate-Body Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±30V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250μA	2.0		4.0	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=9A (Note)		0.36	0.5	Ω
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	V_{DS}=25V, V_{GS}=0V, f=1MHz		2900		pF
Output Capacitance	C_{OSS}			275		pF
Reverse Transfer Capacitance	C_{RSS}			30		pF
SWITCHING PARAMETERS						
Total Gate Charge	Q_G	V_{DS}=480V, V_{GS}=10V, I_D=18A I_G=1mA (Note 1, 2)		75		nC
Gate Source Charge	Q_{GS}			15		nC
Gate Drain Charge	Q_{GD}			20		nC
Turn-ON Delay Time	$t_{D(ON)}$	V_{DS}=100V, V_{GS}=10V, I_D=18A, R_{GS}=25Ω		40		ns
Turn-ON Rise Time	t_R			26		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			232		ns
Turn-OFF Fall-Time	t_F			65		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Continuous Drain-Source Diode Forward Current	I_S	V_{GS}=0V			18	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}	Repetitive			54	A
Drain-Source Diode Forward Voltage	V_{SD}	I_F=I_S ,V_{GS}=0V (Note)			1.5	V
Reverse Recovery Time	t_{rr}	V_{GS}=0V, dI_F/dt=100A/μs, I_S=18A, V_R=400V		500		ns
Reverse Recovery Charge	Q_{rr}			18		μC

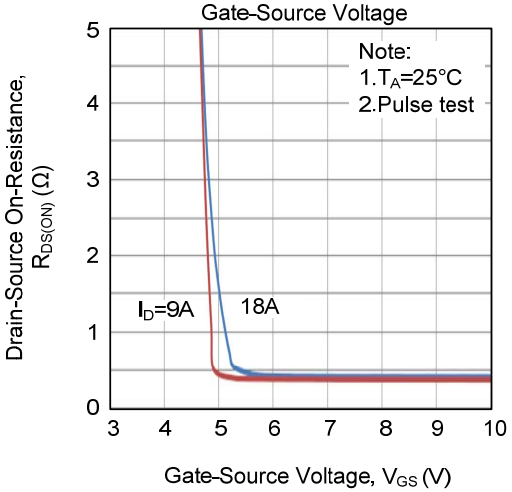
Note: Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.

■ TYPICAL CHARACTERISTICS

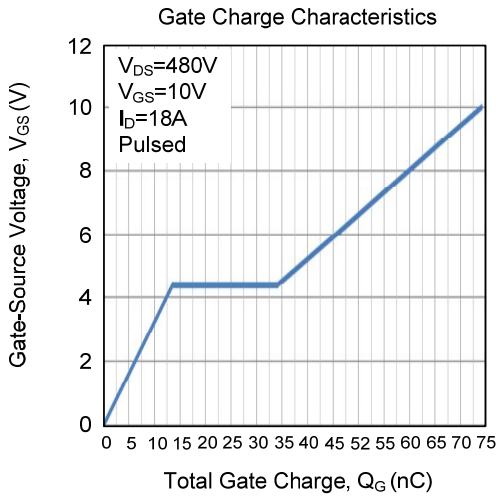
Drain Current vs. Drain-Source Voltage



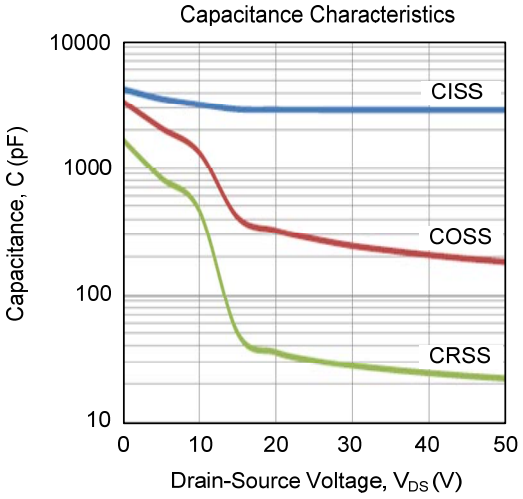
Drain-Source On-Resistance vs. Gate-Source Voltage



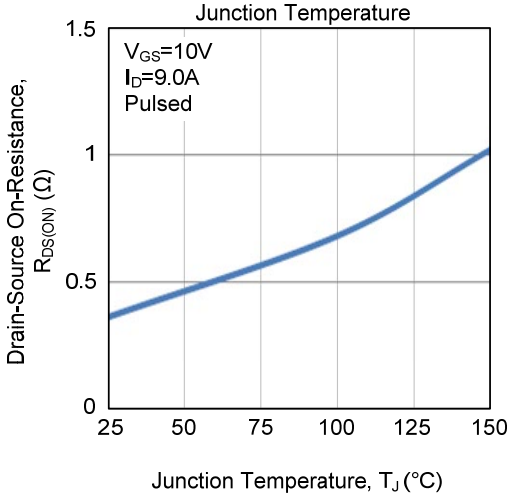
Gate Charge Characteristics



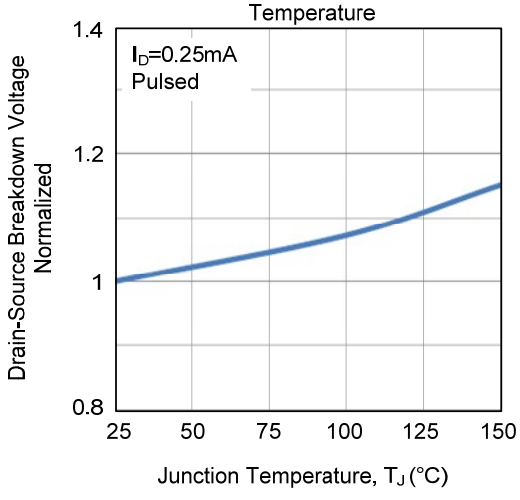
Capacitance Characteristics



Drain-Source On-Resistance vs. Junction Temperature

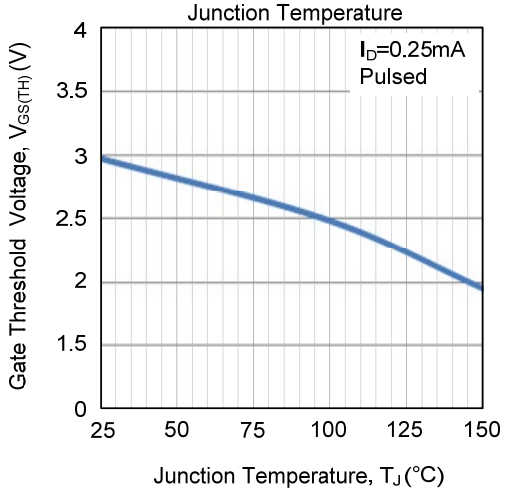


Breakdown Voltage vs. Junction Temperature

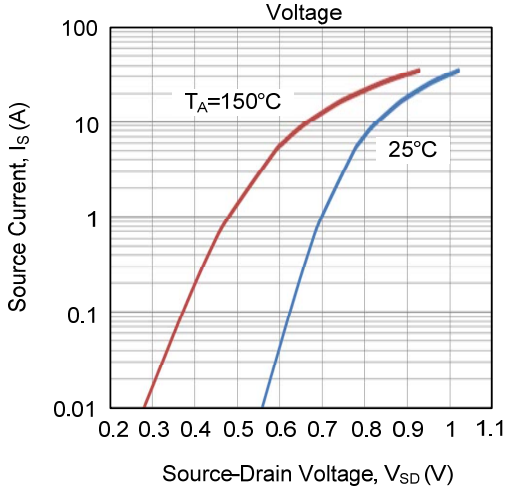


■ TYPICAL CHARACTERISTICS (Cont.)

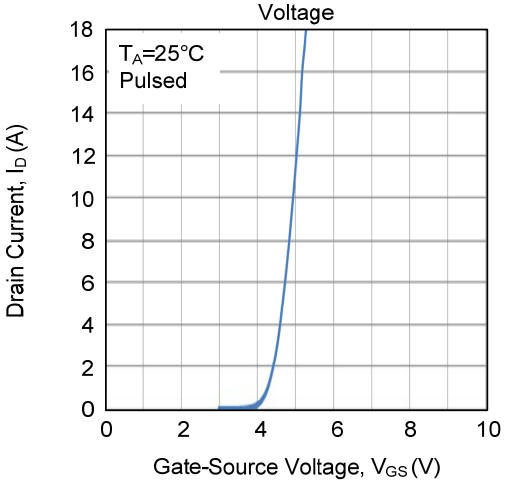
Gate Threshold Voltage vs. Junction Temperature



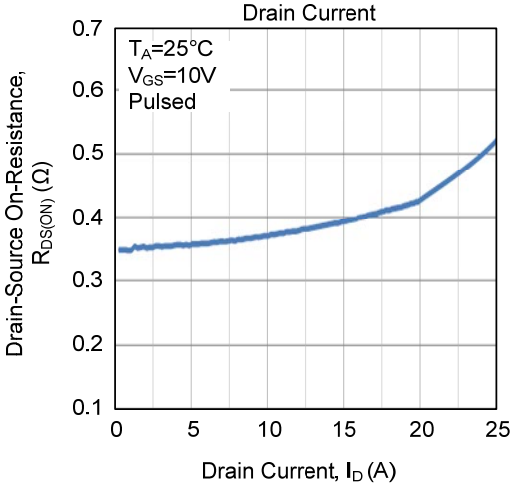
Source Current vs. Source-Drain Voltage



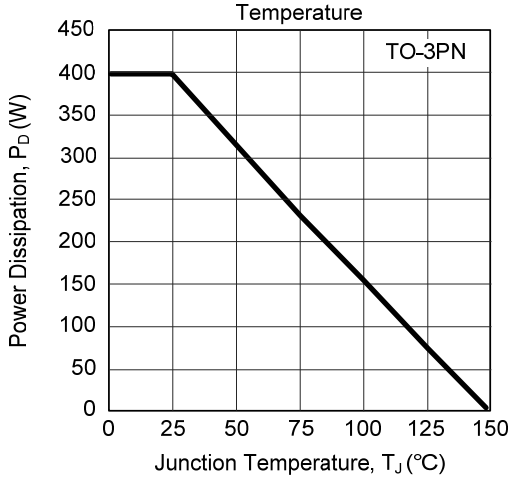
Drain Current vs. Gate-Source Voltage



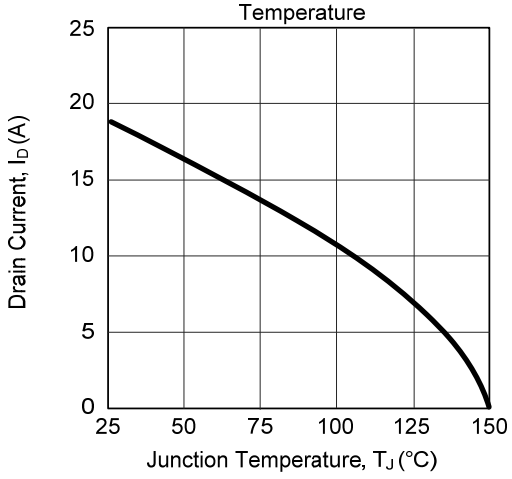
Drain-Source On-Resistance vs. Drain Current



Power Dissipation vs. Junction Temperature



Drain Current vs. Junction Temperature



■ TYPICAL CHARACTERISTICS (Cont.)