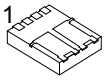
UT3NN10

Power MOSFET

3.0A, 100V DUAL N-CHANNEL ENHANCEMENT MODE POWER MOSFET



PDFN5×6

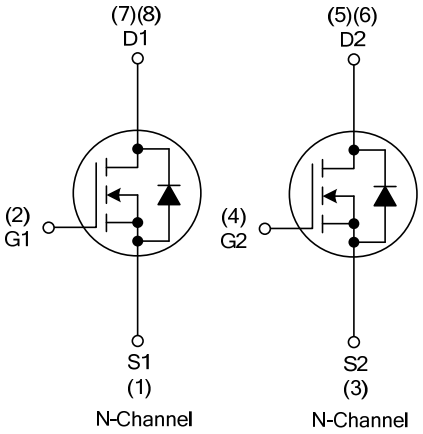
■ DESCRIPTION

The UTC **UT3NN10** is a dual N-Channel enhancement mode power MOSFET, it provides designer with fast switching speed, ruggedized device design, low on-resistance and cost-effectiveness.

■ FEATURES

* $R_{DS(ON)} \leq 0.15\ \Omega$ @ V_{GS}=10V, I_D=3.0A
  $R_{DS(ON)} \leq 0.17\ \Omega$ @ V_{GS}=4.5V, I_D=1.0A
* Fast Switching Speed
* Simple Drive Requirement

■ SYMBOL



■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment						Packing
Lead Free	Halogen Free		1	2	3	4	5, 6	7, 8	
UT3NN10L-P5060-R	UT3NN10G-P5060-R	PDFN5×6	S1	G1	S2	G2	D2	D1	Tape Reel

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

UT3NN10G-P5060-R (1)Packing Type	(1) R: Tape Reel
(2)Package Type	(2) P5060: PDFN5×6
(3)Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free

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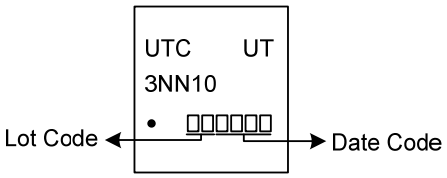
■ MARKING



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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	100	V
Gate-Source Voltage		V_{GSS}	±20	V
Drain Current	Continuous(Note 3)	I_D	3	A
	Pulsed(Note 2)	I_{DM}	6	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	21	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	3	V/ns
Power Dissipation		P_D	3.6	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.
3. L = 0.1mH, I_{AS} = 20.5A, V_{DD} = 25V, R_G = 25 Ω Starting T_J = 25°C
4. I_{SD} ≤ 3.0A, di/dt ≤200A/μs, V_{DD} ≤BV_{DSS}, Starting T_J = 25°C

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	35	°C/W

Note: Device mounted on FR-4 substrate P_C board, 2oz copper, with 1inch square copper plate.

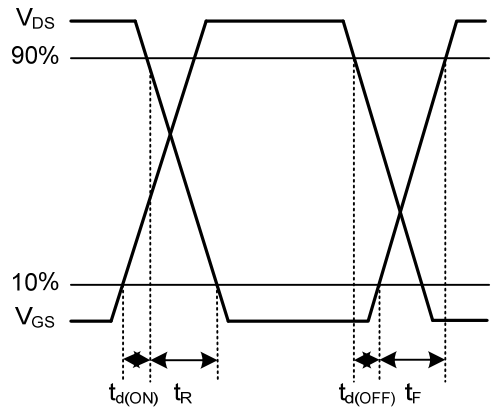
■ ELECTRICAL CHARACTERISTICS (T_J=25°C, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	V_{GS}=0V, I_D=250μA	100			V
Drain-Source Leakage Current		I_{DSS}	V_{DS}=100V, V_{GS}=0V			1	μA
Gate-Source Leakage Current	Forward	I_{GSS}	V_{DS}=0V ,V_{GS}=20V			100	nA
	Reverse		V_{DS}=0V ,V_{GS}=-20V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250μA	1.0		3.0	V
Drain-Source On-State Resistance (Note 1)		$R_{DS(ON)}$	V_{GS}=10V, I_D=3.0A			0.15	Ω
			V_{GS}=4.5V, I_D=1.0A			0.17	Ω
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	V_{DS}=25V, V_{GS}=0V, f=1.0MHz		730		pF
Output Capacitance		C_{OSS}			46		pF
Reverse Transfer Capacitance		C_{RSS}			36		pF
SWITCHING PARAMETERS							
Total Gate Charge (Note 1)	10V	Q_G	V_{DS}=80V, V_{GS}=10V, I_D=3.0A I_G=1mA (Note 1, 2)		11		nC
	4.5V				7.3		nC
Gate-Source Charge		Q_{GS}			2.6		nC
Gate-Drain Charge		Q_{GD}			4		nC
Turn-ON Delay Time (Note 1)		$t_{D(ON)}$	V_{DS}=80V, V_{GS}=10V, I_D=3.0A, R_G=25Ω (Note 1, 2)		5.6		ns
Turn-ON Rise Time		t_R			16		ns
Turn-OFF Delay Time		$t_{D(OFF)}$			85		ns
Turn-OFF Fall Time		t_F			35		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Continuous Drain-Source Diode Forward Current		I_S				3	A
Maximum Pulsed Drain-Source Diode Forward Current		I_{SM}				6	A
Drain-Source Diode Forward Voltage (Note 1)		V_{SD}	I_S =1.2A, V_{GS}=0V			1.2	V
Body Diode Reverse Recovery Time (Note 1)		t_{rr}	I_S =3.0A, V_{GS}=0V, dI_F/dt=100A/μs		70		ns
Body Diode Reverse Recovery Charge		Q_{rr}			87		nC

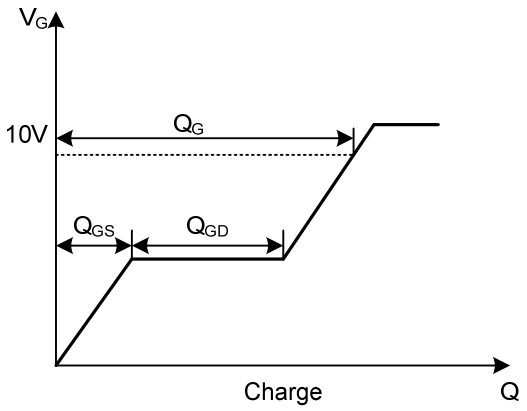
Notes: 1. Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2%.
2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS

Switching Time Waveforms

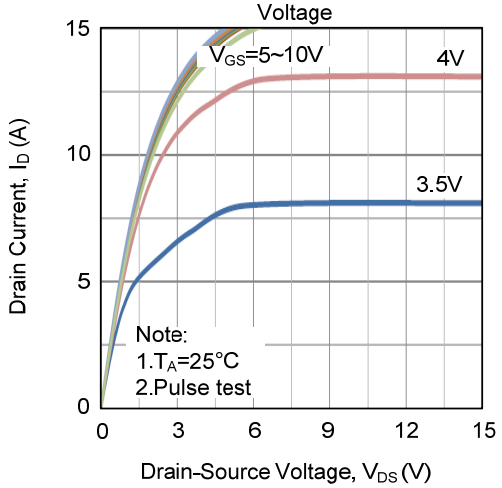


Gate Charge Waveforms

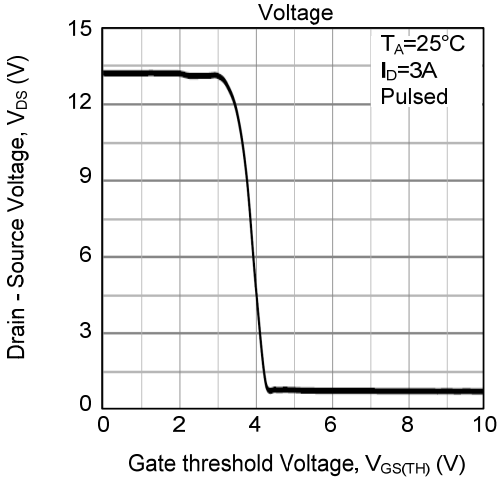


■ TYPICAL CHARACTERISTICS

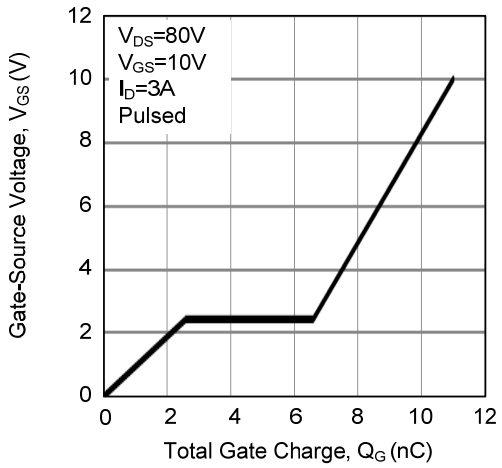
Drain Current vs. Drain-Source Voltage



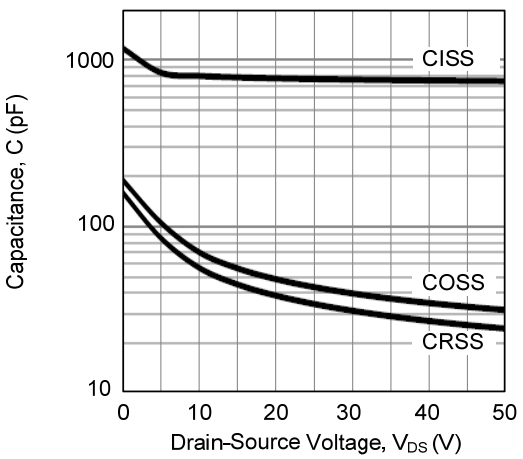
Drain Current vs Gate threshold Voltage



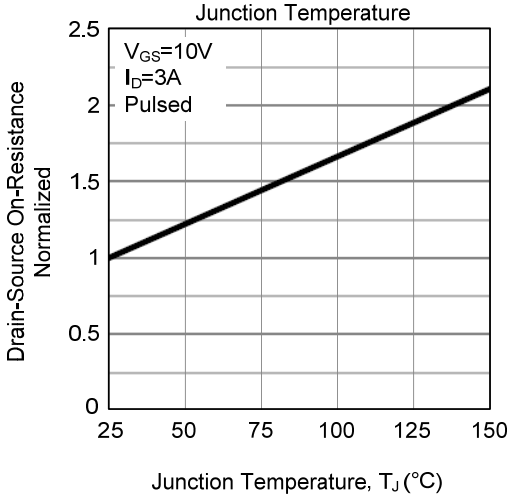
Gate Charge Characteristics



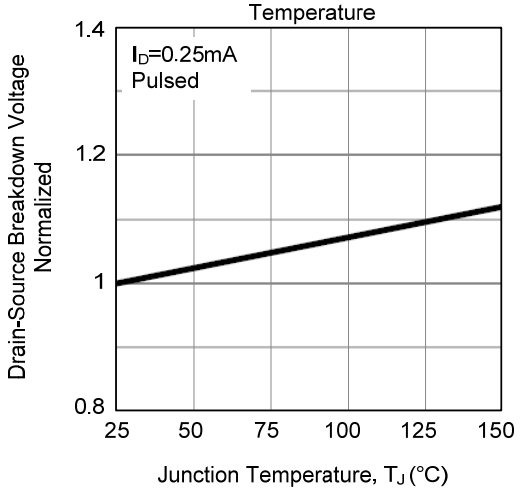
Capacitance Characteristics



Drain-Source On-Resistance vs. Junction Temperature

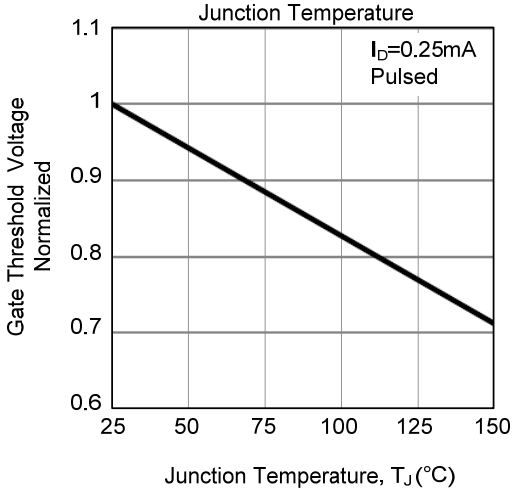


Breakdown Voltage vs. Junction Temperature

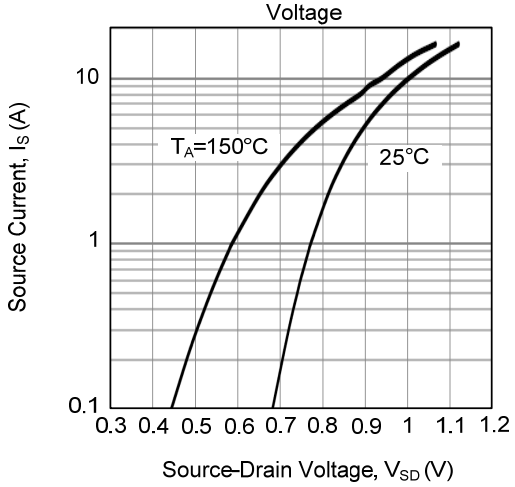


■ TYPICAL CHARACTERISTICS (Cont.)

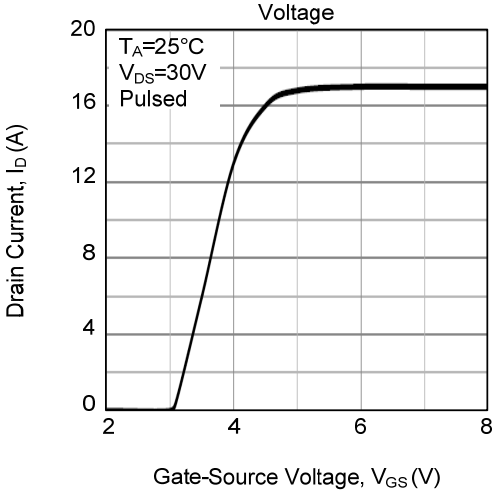
Gate Threshold Voltage vs. Junction Temperature



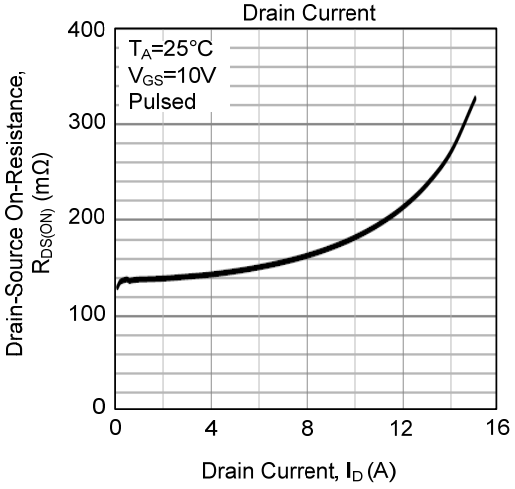
Source Current vs. Source-Drain Voltage



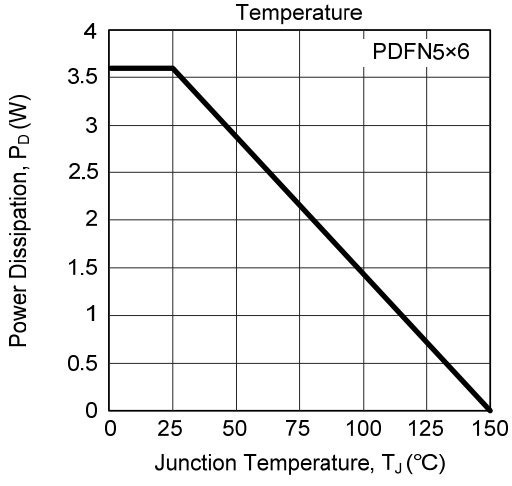
Drain Current vs. Gate-Source Voltage



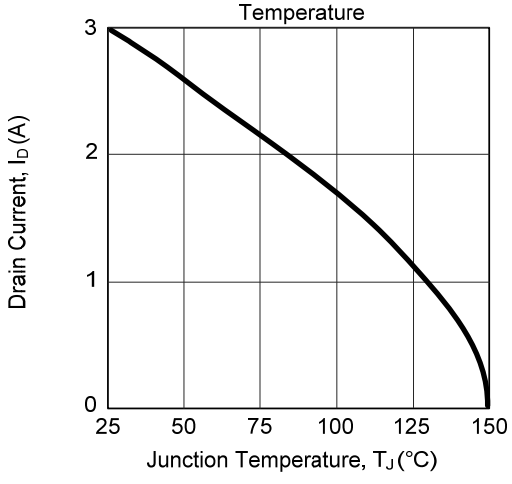
Drain-Source On-Resistance vs. Drain Current



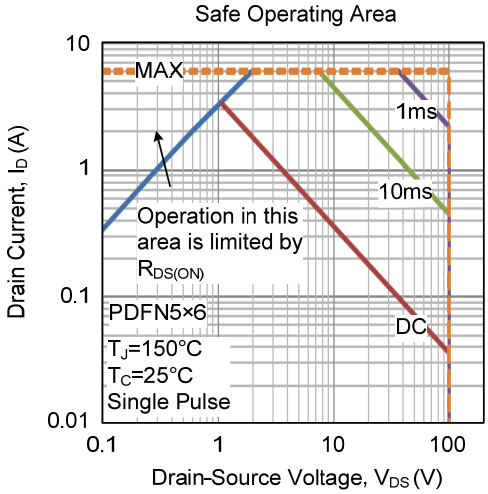
Power Dissipation vs. Junction Temperature



Drain Current vs. Junction Temperature



■ TYPICAL CHARACTERISTICS (Cont.)



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