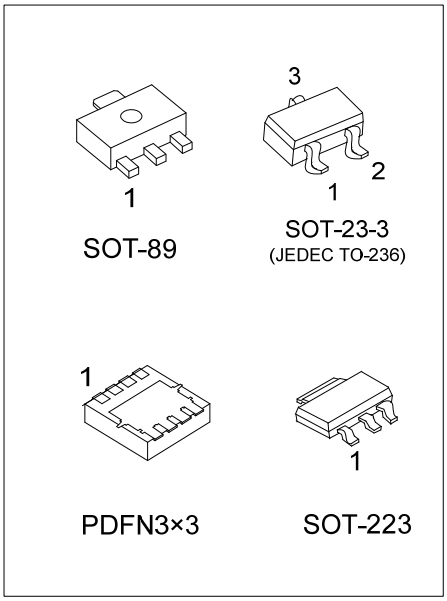
UTT2N10-H

POWER MOSFET

2.0A, 100V HEXFET POWER MOSFET



■ DESCRIPTION

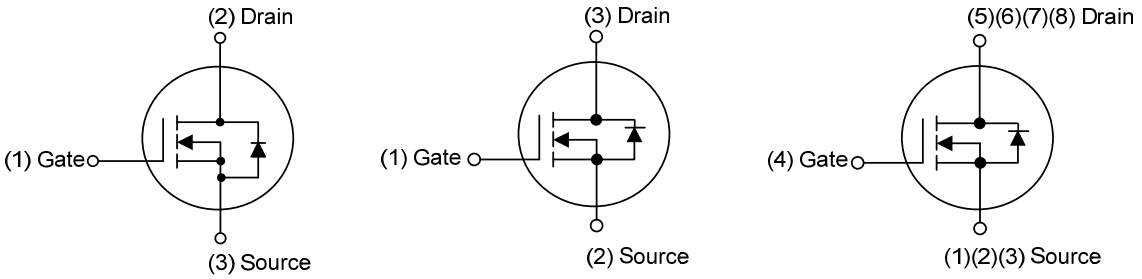
The UTC **UTT2N10-H** is an N-channel Power MOSFET, it uses UTC's advanced technology to provide the customers with high switching speed and low gate charge.

The UTC **UTT2N10-H** is suitable for Load/system switch.

■ FEATURES

* $R_{DS(ON)}$ ≤ 220 mΩ @ V_{GS}=10V, I_D=1.6A
  $R_{DS(ON)}$ ≤ 235 mΩ @ V_{GS}=4.5V, I_D=1.3A
* High switching speed
* Low gate charge

■ SYMBOL



SOT-223 / SOT-89 SOT-23-3 PDFN3×3

■ ORDERING INFORMATION

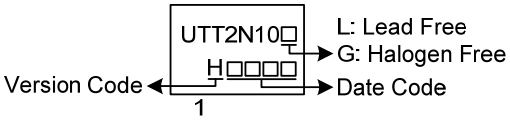
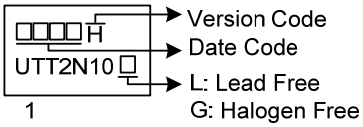
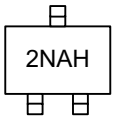
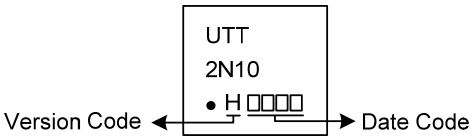
Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UTT2N10L-AA3-R	UTT2N10G-AA3-R	SOT-223	G	D	S	-	-	-	-	-	Tape Reel
UTT2N10L-AB3-R	UTT2N10G-AB3-R	SOT-89	G	D	S	-	-	-	-	-	Tape Reel
UTT2N10L-AE2-R	UTT2N10G-AE2-R	SOT-23-3	G	S	D	-	-	-	-	-	Tape Reel
UTT2N10L-P3030-R	UTT2N10G-P3030-R	PDFN3×3	S	S	S	G	D	D	D	D	Tape Reel

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

UTT2N10G-AA3-R
(1)Packing Type
(2)Package Type
(3)Green Package

(1) R: Tape Reel
(2) AA3: SOT-223, AB3: SOT-89, AE2: SOT-23-3
P3030: PDFN3×3
(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING

SOT-223	SOT-89
	
SOT-23-3	**PDFN3×3**
	

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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	100	V
Gate-Source Voltage		V_{GSS}	±16	V
Drain Current	Continuous	I_D	2	A
	Pulsed (Note 2)	I_{DM}	4	A
Avalanche Energy (Note 3)	Single Pulsed (Note 3)	E_{AS}	0.1	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	2.1	V/ns
Power Dissipation	SOT-223	P_D	1.2	W
	SOT-89		1.4	W
	SOT-23-3		0.89	W
	PDFN3×3		8	W
Junction Temperature		T_J	+150	°C
Storage Temperature Range		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} = 1.3A, V_{DD} = 50V, R_G = 25Ω, Starting T_J = 25°C.
4. I_{SD} ≤ 2.0A, di/dt ≤ 100 A/μs, V_{DD} ≤ $V_{(BR)DSS}$, T_J = 25°C.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	SOT-223	θ_{JA}	140 (Note)	°C/W
	SOT-89		104 (Note)	°C/W
	SOT-23-3		177 (Note)	°C/W
	PDFN3×3		130 (Note)	°C/W
Case to Ambient	SOT-223	θ_{JC}	104 (Note)	°C/W
	SOT-89		89 (Note)	°C/W
	SOT-23-3		140 (Note)	°C/W
	PDFN3×3		15.6 (Note)	°C/W

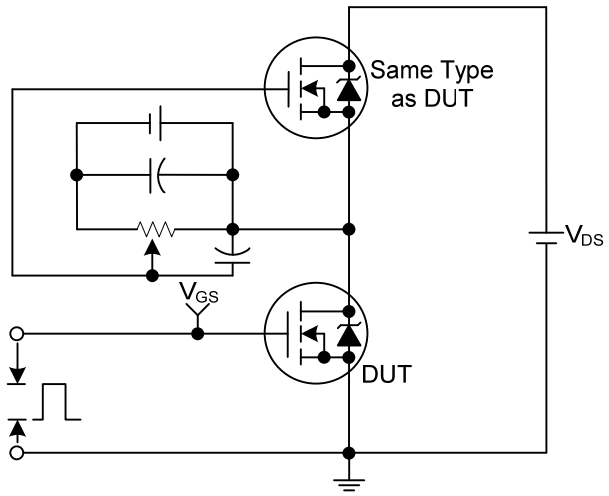
Note: Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

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

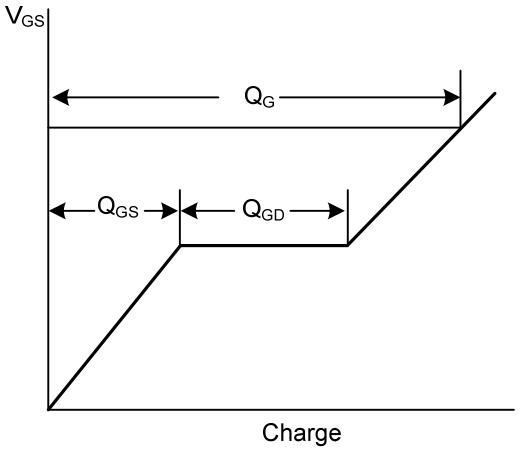
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	V_{GS} =0V, I_D =250μA	100			V
Drain-Source Leakage Current		I_{DSS}	V_{DS} =100V,V_{GS} =0V			1	μA
Gate-Source Leakage Current		I_{GSS}	V_{GS} =±16V			±100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	V_{DS} =V_{GS}, I_D =250μA	1.0		2.5	V
Drain to Source On-state Resistance		$R_{DS(ON)}$	V_{GS} =10V, I_D =1.6A			220	mΩ
			V_{GS}=4.5V, I_D=1.3A			235	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	V_{DS}=25V,V_{GS}=0V, f=1.0MHz		310		pF
Output Capacitance		C_{OSS}			25		pF
Reverse Transfer Capacitance		C_{RSS}			20		pF
SWITCHING PARAMETERS							
Total Gate Charge (Note 1)	V_{GS}=4.5V	Q_G	V_{DS}=80V, I_D=2.0A, I_G=1mA (Note 1, 2)		5		nC
	V_{GS}=10V				10		nC
Gate Source Charge		Q_{GS}			2		nC
Gate Drain Charge		Q_{GD}			1		nC
Turn-ON Delay Time (Note 1)		$t_{D(ON)}$	V_{DD}=50V, V_{GS}=10V, I_D=2.0A, R_G =25Ω (Note 1, 2)		4		ns
Turn-ON Rise Time		t_R			17		ns
Turn-OFF Delay Time		$t_{D(OFF)}$			32		ns
Turn-OFF Fall-Time		t_F			25		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Continuous Drain-Source Diode Forward Current		I_S				2	A
Maximum Pulsed Drain-Source Diode Forward Current		I_{SM}				4	A
Drain-Source Diode Forward Voltage (Note 1)		V_{SD}	I_S =2.0A, V_{GS} =0V			1.4	V
Reverse Recovery Time (Note 1)		t_{rr}	I_S=2.0A,V_{GS}=0V, dI/dt=100A/μs		46		ns
Reverse Recovery Charge		Q_{rr}			48		nC

Notes: 1. Pulse Test: Pulse width ≤ 1000μs, Duty cycle ≤ 2%.
2. Essentially independent of operating ambient temperature.

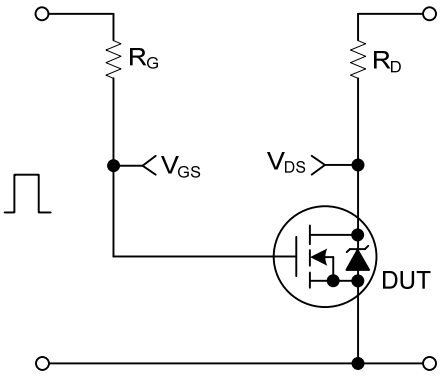
■ TEST CIRCUITS AND WAVEFORMS



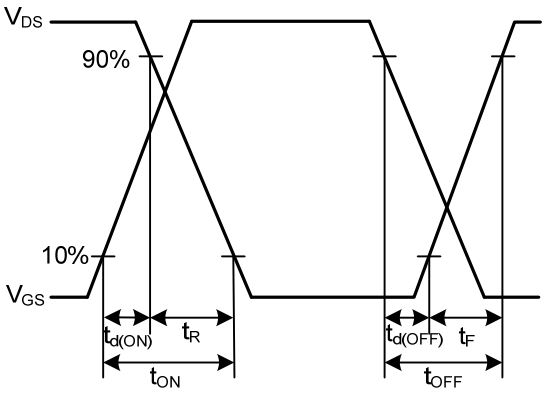
Gate Charge Test Circuit



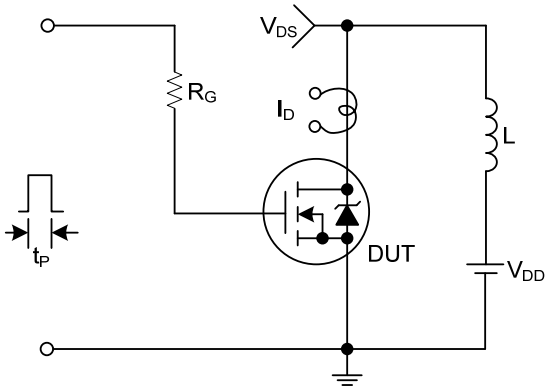
Gate Charge Waveforms



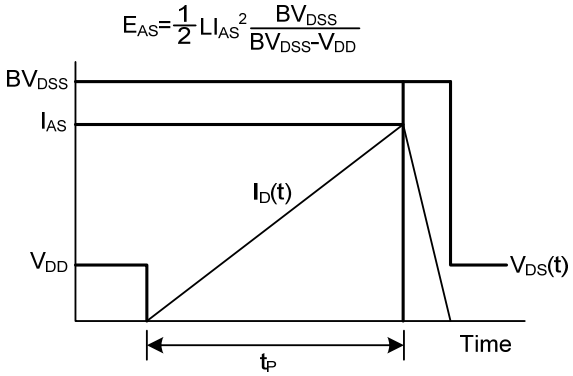
Resistive Switching Test Circuit



Resistive Switching Waveforms



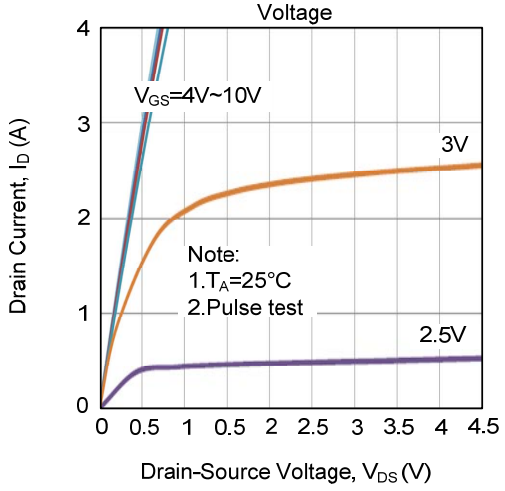
Unclamped Inductive Switching Test Circuit



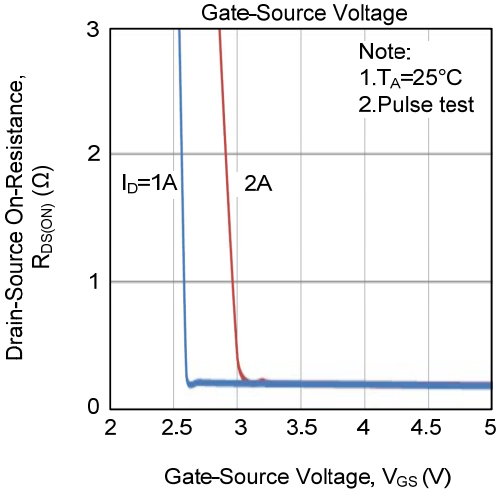
Unclamped Inductive Switching Waveforms

■ TYPICAL CHARACTERISTICS

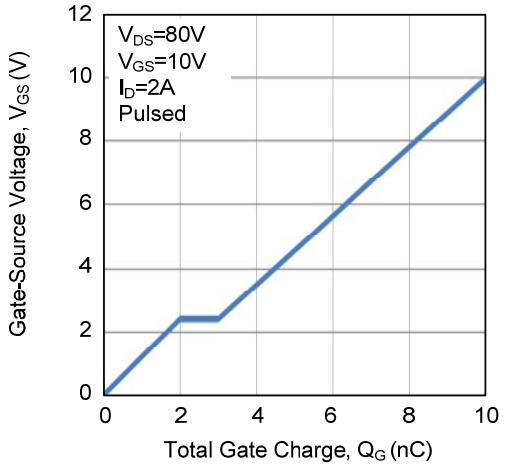
Drain Current vs. Drain-Source Voltage



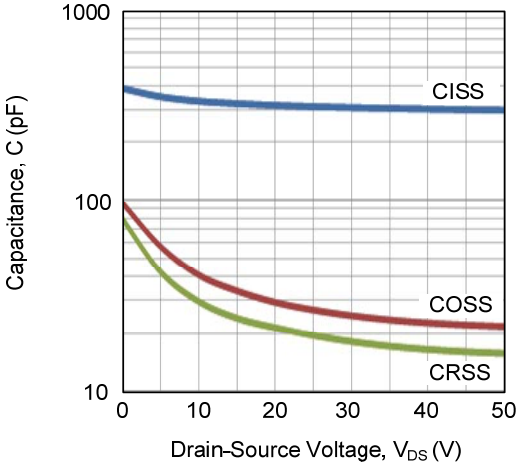
Drain-Source On-Resistance vs. Gate-Source Voltage



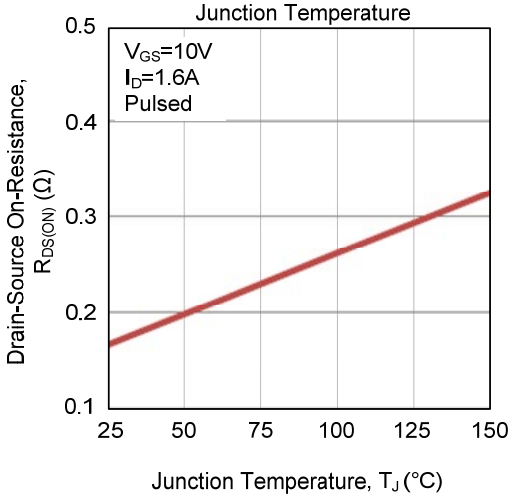
Gate Charge Characteristics



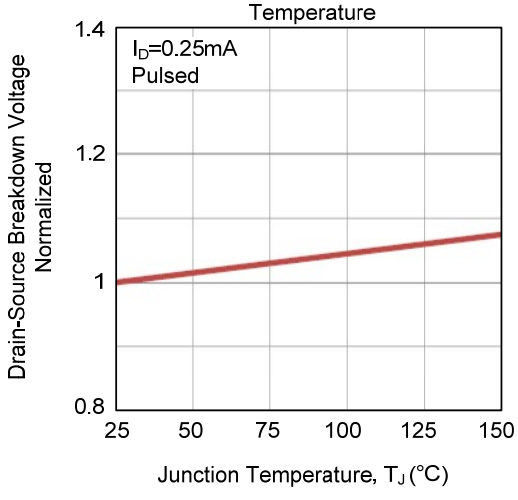
Capacitance Characteristics



Drain-Source On-Resistance vs. Junction Temperature

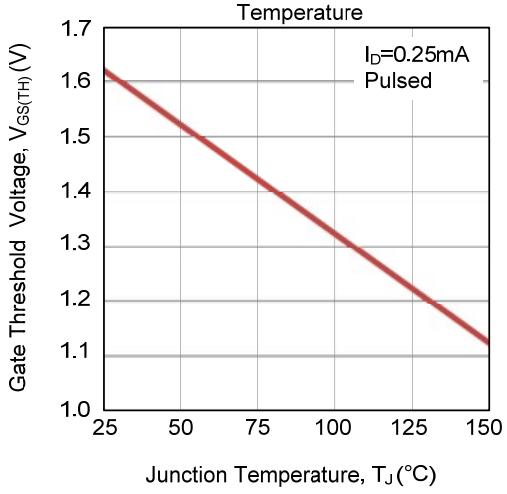


Breakdown Voltage vs. Junction Temperature

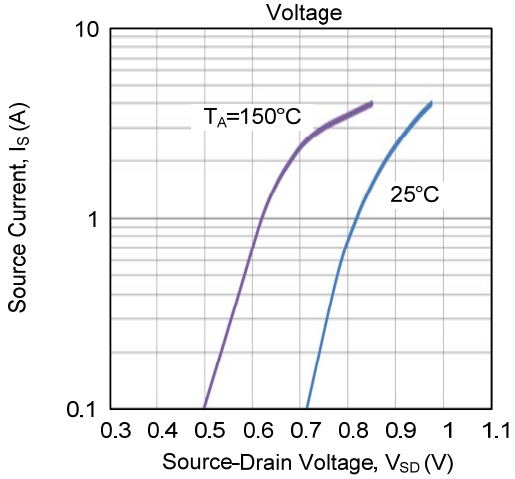


■ TYPICAL CHARACTERISTICS (Cont.)

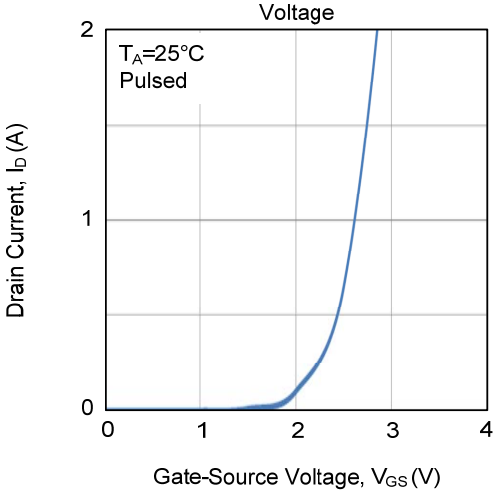
Gate Threshold Voltage vs. Junction Temperature



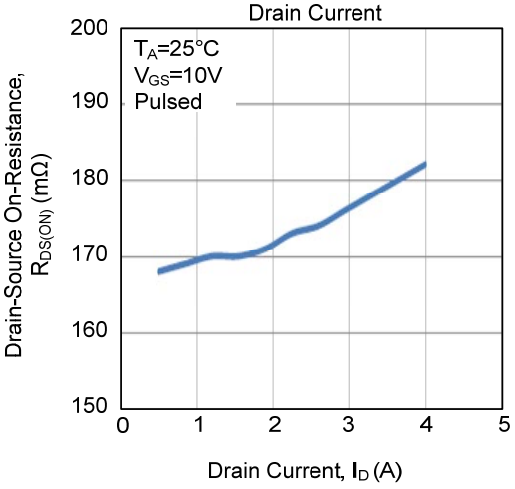
Source Current vs. Source-Drain Voltage



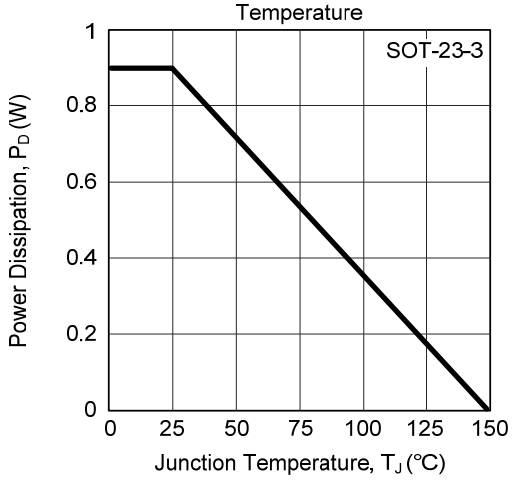
Drain Current vs. Gate-Source Voltage



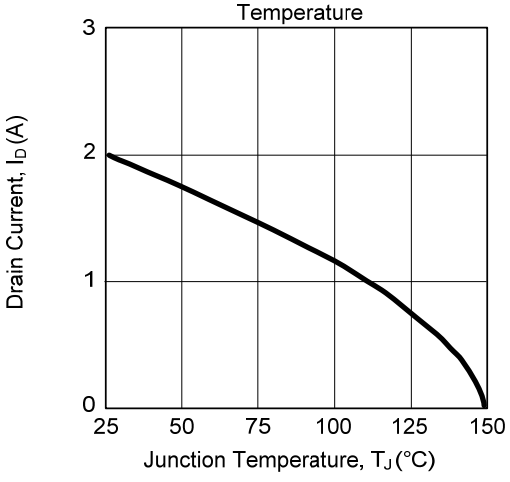
Drain-Source On-Resistance vs. Drain Current



Power Dissipation vs. Junction Temperature



Drain Current vs. Junction Temperature



■ TYPICAL CHARACTERISTICS (Cont.)