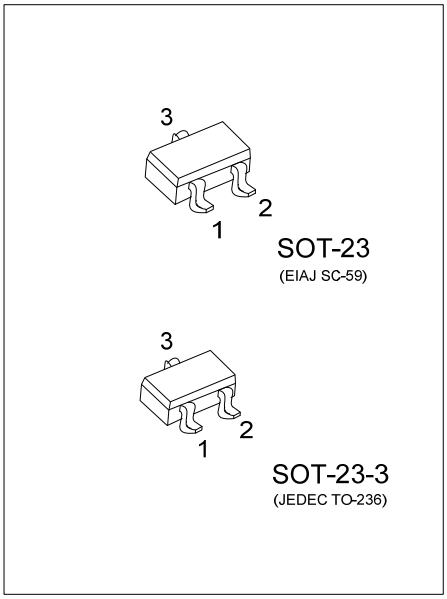
UTT1D5N10

Power MOSFET

1.5A, 100V N-CHANNEL LOGIC LEVEL ENHANCEMENT MODE FIELD EFFECT TRANSISTOR



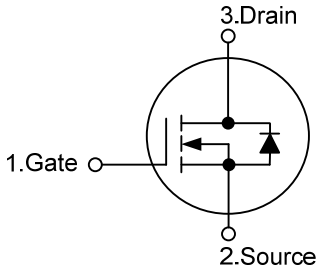
■ DESCRIPTION

The UTC **UTT1D5N10** is an N-channel MOSFET, it uses UTC's advanced technology to provide the customers with high switch speed and low gate charge.

■ FEATURES

* $R_{DS(ON)}$ ≤ 280 mΩ @ V_{GS}=10V, I_D=0.75A
  $R_{DS(ON)}$ ≤ 300 mΩ @ V_{GS}=4.5V, I_D=0.7A
* High switch speed
* Low gate charge

■ SYMBOL



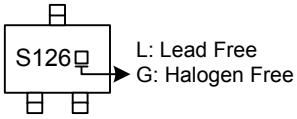
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTT1D5N10L-AE2-R	UTT1D5N10G-AE2-R	SOT-23-3	G	S	D	Tape Reel
UTT1D5N10L-AE3-R	UTT1D5N10G-AE3-R	SOT-23	G	S	D	Tape Reel

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

UTT1D5N10G-AE2-R (1)Packing Type (2)Package Type (3)Green Package	(1) R: Tape Reel (2) AE2: SOT-23-3, AE3: SOT-23 (3) G: Halogen Free and Lead Free, L: Lead Free

■ 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 1)	T_A=25°C	I_D	1.5	A
		T_A=70°C		1.2	A
	Pulsed (Note 2)		I_{DM}	5	A
Power Dissipation (Note 1)	SOT-23		P_D	1.2	W
	SOT-23-3			1.1	W
Junction Temperature			T_J	-55 ~ +150	°C
Storage Temperature Range			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 DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	SOT-23	θ_{JA}	104	°C/W
Junction to Ambient	SOT-23-3	θ_{JA}	113	°C/W

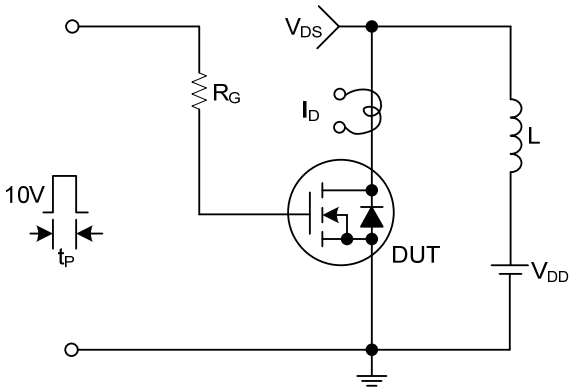
Note: Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

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

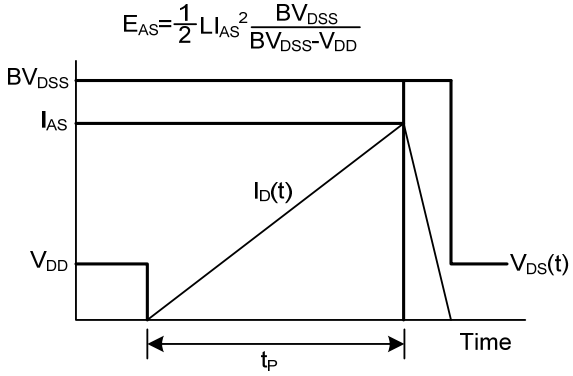
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	I_D=250μA, V_{GS}=0V	100			V
Drain-Source Leakage Current		I_{DSS}	V_{DS}=80V, V_{GS}=0V			1	μA
Gate-Source Leakage Current	Forward	I_{GSS}	V_{GS}=+20V, V_{DS}=0V			+100	nA
	Reverse		V_{GS}=-20V, V_{DS}=0V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250μA	1.0	1.7	2.5	V
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	V_{GS}=10V, I_D=0.75A			280	mΩ
			V_{GS}=4.5V, I_D=0.7A			300	mΩ
DYNAMIC PARAMETERS (Note 3)							
Input Capacitance		C_{ISS}	V_{GS}=0V, V_{DS}=25V, f=1.0MHz		420		pF
Output Capacitance		C_{OSS}			31		pF
Reverse Transfer Capacitance		C_{RSS}			21		pF
SWITCHING PARAMETERS (Note 3)							
Total Gate Charge		Q_G	V_{DS}=80V, V_{GS}=10V, I_D=1.5A		21		nC
Gate to Source Charge		Q_{GS}			3.5		nC
Gate to Drain Charge		Q_{GD}			2.7		nC
Turn-ON Delay Time		$t_{D(ON)}$	V_{DD}=50V, V_{GS}=10V, I_D=1.5A, R_G =25Ω		4.8		ns
Rise Time		t_R			16.5		ns
Turn-OFF Delay Time		$t_{D(OFF)}$			42		ns
Fall-Time		t_F			28		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I_S				1	A
Maximum Body-Diode Pulsed Current (Note 1)		I_{SM}				2	A
Drain-Source Diode Forward Voltage		V_{SD}	I_S=1.5A, V_{GS}=0V		0.8	1.2	V
Body Diode Reverse Recovery Time		t_{rr}	I_S=1.5A, V_{GS}=0V, dI_F/dt=100A/μs		43		ns
Body Diode Reverse Recovery Charge		Q_{rr}			30		nC

Notes: 1. Surface Mounted on FR4 Board, t ≤ 10sec.
2. Pulse Test:Pulse Width≤300us, Duty Cycle≤ 2%.
3. Guaranteed by design, not subject to production testing.
4. Starting T_J=25°C, L=0.5mH, V_{DD}=50V.(See Figure1)

■ TEST CIRCUITS AND WAVEFORMS



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

Figure 1.