UTC

UNISONIC TECHNOLOGIES CO., LTD

UTT4425   Preliminary   *Power MOSFET*

P-CHANNEL ENHANCEMENT MODE POWER MOSFET
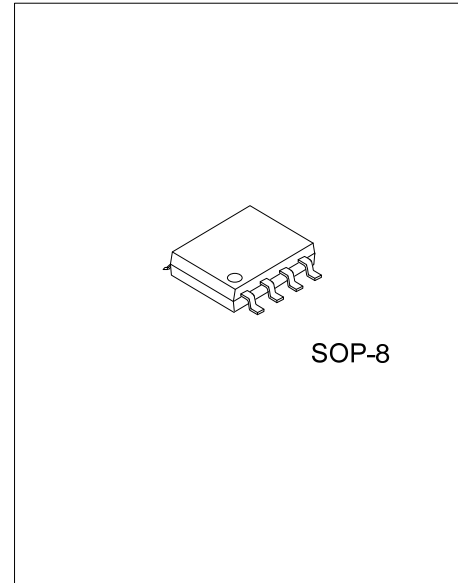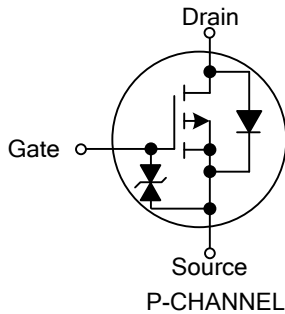
SOP-8

■ DESCRIPTION

The UTC **UTT4425** is a P-channel enhancement mode power MOSFET using UTC's advanced trench technology to provide customers with a minimum on-state resistance and extremal low gate charge with a 25V gate rating.

The UTC **UTT4425 i**s ESD protected and it is universally applied in PWM or used as a load switch.

■ FEATURES

* $V_{DS(V)}$= -30V
* I_D=-14A, (V_{GS}= -20V)
* $R_{DS(ON)}$ < 10mΩ @(V_{GS} = -20V)
  $R_{DS(ON)}$ < 11mΩ @(V_{GS} = -10V)

■ SYMBOL

Drain

Gate

Source

P-CHANNEL

■ ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
UTT4425L-S08-R	UTT4425G-S08-R	SOP-8	Tape Reel

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

UTT4425L-S08-R

(1) Packing Type   (1) R: Tape Reel

(2) Package Type   (2) S08: SOP-8

(3) Lead Free   (3) G: Halogen Free, L: Lead Free

■ **PIN CONFIGURATION**

```
        ┌─────────────────┐
Source │1│   ◯           │8│ Drain
        │                 │
Source │2│               │7│ Drain
        │                 │
Source │3│               │6│ Drain
        │                 │
  Gate │4│               │5│ Drain
        └─────────────────┘
```
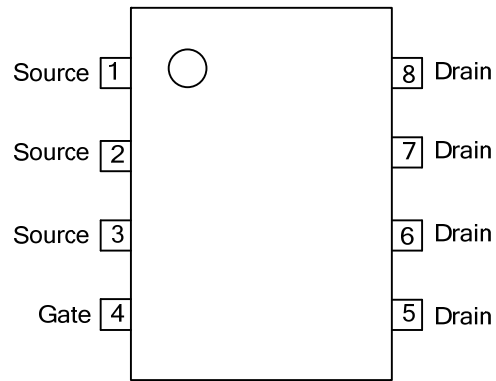
■ **ABSOLUTE MAXIMUM RATINGS** (T_A = 25°C, unless otherwise specified)

PARAMETER			SYMBOL	RATINGS	UNIT
Drain-Source Voltage			V_{DSS}	-30	V
Gate-Source Voltage			V_{GSS}	±25	
Drain Current	Continuous (Note 2)	T_A = 25°C	I_D	-14	A
		T_A = 70°C		-11	
	Pulsed (Note 3)		I_{DM}	-50	
Power Dissipation (Note 2)		T_A = 25°C	P_D	3.1	W
		T_A = 70°C		2	
Junction Temperature			T_J	+150	°C
Storage Temperature			T_{STG}	-55~+150	°C

■ **THERMAL CHARACTERISTICS**

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient (Note 2)	θ_{JA}	75	°C/W

Note: 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. The value of $R_{\theta JA}$ is measured with the device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25°C. The value in any given application depends on the user's specific board design. The current rating is based on the t ≤ 10s thermal resistance rating.

    3. Repetitive rating, pulse width limited by junction temperature.

UTT4425   Preliminary   *Power MOSFET*

■ **ELECTRICAL CHARACTERISTICS** (T_J =25°C)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	V_{GS} =0 V, I_D =-250µA	-30			V
Drain-Source Leakage Current		I_{DSS}	V_{DS} =-30V, V_{GS} =0 V			-100	nA
			V_{DS} =-30V, V_{GS} =0V, T_J =55°C			-500	
Gate- Source Leakage Current	Forward	I_{GSS}	V_{GS}=+20V, V_{DS}=0V			+1	µA
	Reverse		V_{GS}=-20V, V_{DS}=0V			-1	
	Forward		V_{GS}=+25V, V_{DS}=0V			+10	
	Reverse		V_{GS}=-25V, V_{DS}=0V			-10	
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	V_{DS} =V_{GS}, I_D =-250 µA	-2	-2.5	-3.5	V
Drain-Source On-State Resistance		$R_{DS(ON)}$	V_{GS} =-20V, I_D =-14A		7.7	10	mΩ
			V_{GS} =-20V, I_D=-14A, T_J =125°C		11	13.5	mΩ
			V_{GS} =-10V, I_D =-14A		8.8	11	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	V_{DS} =-20 V, V_{GS} =0V, f=1MHz		3800		pF
Output Capacitance		C_{OSS}			560		
Reverse Transfer Capacitance		C_{RSS}			350		
Gate Resistance		R_g	V_{DS} =0V, V_{GS} =0V, f=1MHz		7.5		Ω
SWITCHING PARAMETERS							
Total Gate Charge		Q_G	V_{DS} =-20V, V_{GS} =-10V, I_D=-14A (Note 1 ,2)		63		nC
Gate Source Charge		Q_{GS}			14.1		
Gate Drain Charge		Q_{GD}			16.1		
Turn-ON Delay Time		$t_{D(ON)}$	V_{DS} =-20V, V_{GS} =-10V, R_L=1.35Ω, R_{GEN}=3Ω (Note 1 ,2)		12.4		ns
Turn-ON Rise Time		t_R			9.2		
Turn-OFF Delay Time		$t_{D(OFF)}$			97.5		
Turn-OFF Fall-Time		t_F			45.5		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS							
Drain-Source Diode Forward Voltage		V_{SD}	I_S=-1A, V_{GS}=0V		-0.71	-1	V
Maximum Continuous Drain-Source Diode Forward Current		I_S				-4.2	A
Body Diode Reverse Recovery Time		t_{RR}	I_F=-14A, dI/dt=100A/µs		35		ns
Body Diode Reverse Recovery Charge		Q_{RR}	I_F=-14A, dI/dt=100A/µs (Note 1)		35		nC

Note: 1. Pulse Test: Pulse width ≤ 300µs, Duty cycle ≤ 2%

      2. Essentially independent of operating temperature

UTC **UNISONIC TECHNOLOGIES CO., LTD**
www.unisonic.com.tw