



# P-CHANNEL ENHANCEMENT MODE POWER MOSFET

### DESCRIPTION

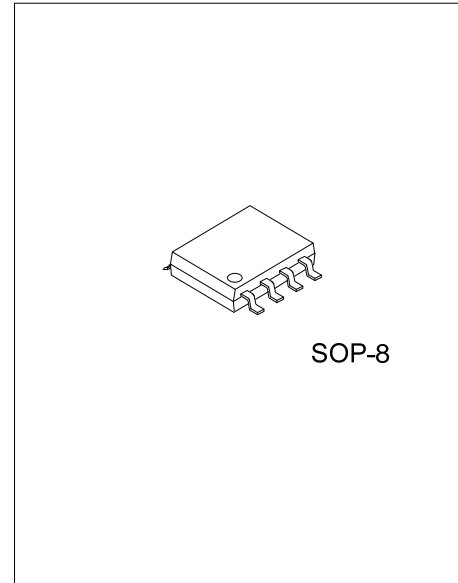
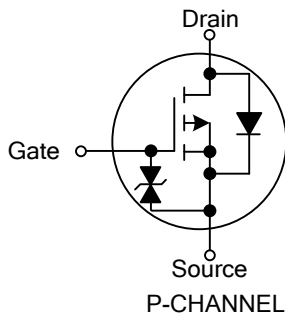
The UTC **UTT4407** is a P-channel enhancement mode power MOSFET using UTC's advanced trench technology to provide customers with a minimum on-state resistance and extremal low gate charge with a 25V gate rating

The UTC **UTT4407** is universally applied in PWM or used as a load switch.

### FEATURES

- \*  $V_{DS(V)} = -30V$
- \*  $I_D = -12A$  ( $V_{GS} = -20V$ )
- \*  $R_{DS(ON)} < 13m\Omega$  @  $V_{GS} = -20V, I_D = -10A$
- \*  $R_{DS(ON)} < 14m\Omega$  @  $V_{GS} = -4.5V, I_D = -10A$

### SYMBOL



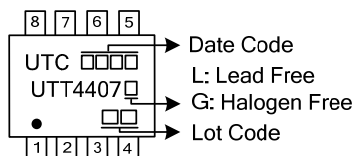
### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UTT4407L-S08-R	UTT4407G-S08-R	SOP-8	S	S	S	G	D	D	D	D	Tape Reel

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

UTT4407G-S08-R	(1)Packing Type	(1) R: Tape Reel
	(2)Package Type	(2) S08: SOP-8
	(3)Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free

### MARKING



■ ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ , unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT	
Drain-Source Voltage		$V_{DSS}$	-30	V	
Gate-Source Voltage		$V_{GSS}$	$\pm 25$		
Drain Current	Continuous(Note 2)	$I_D$	$T_A = 25^\circ\text{C}$	-12	A
			$T_A = 70^\circ\text{C}$	-10	
Pulsed (Note 3)		$I_{DM}$	-60		
Power Dissipation (Note 2)		$P_D$	$T_A = 25^\circ\text{C}$	3	W
			$T_A = 70^\circ\text{C}$	2.1	
Junction Temperature		$T_J$	+150	$^\circ\text{C}$	
Storage Temperature		$T_{STG}$	-55 ~ + 150	$^\circ\text{C}$	

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. Device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, t = 10sec.

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

■ THERMAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ )

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient (Note )	$\theta_{JA}$	75	$^\circ\text{C/W}$

Note: Device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, t = 10sec.

■ ELECTRICAL CHARACTERISTICS ( $T_J = 25^\circ\text{C}$ , unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS} = 0\text{ V}, I_D = -250\mu\text{A}$	-30			V
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS} = -24\text{V}, V_{GS} = 0\text{ V}$			-1	$\mu\text{A}$
		$V_{DS} = -24\text{V}, V_{GS} = 0\text{ V}, T_J = 55^\circ\text{C}$			-5	
Gate- Source Leakage Current	Forward	$I_{GSS}$	$V_{GS} = +25\text{V}, V_{DS} = 0\text{V}$		+100	$\mu\text{A}$
	Reverse			$V_{GS} = -25\text{V}, V_{DS} = 0\text{V}$		
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS} = V_{GS}, I_D = -250\mu\text{A}$	-1.7	-2.5	-3	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS} = -10\text{V}, I_D = -10\text{A}$		11	14	$\text{m}\Omega$
		$V_{GS} = -10\text{V}, I_D = -10\text{A}, T_J = 125^\circ\text{C}$		15	19	$\text{m}\Omega$
		$V_{GS} = -20\text{V}, I_D = -10\text{A}$		10	13	$\text{m}\Omega$
		$V_{GS} = -4.5\text{V}, I_D = -10\text{A}$		24		$\text{m}\Omega$
<b>DYNAMIC PARAMETERS</b>						
Input Capacitance	$C_{ISS}$	$V_{DS} = -15\text{ V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$		2076	2500	pF
Output Capacitance	$C_{OSS}$			503		
Reverse Transfer Capacitance	$C_{RSS}$			302		
Gate Resistance	$R_g$	$V_{DS} = 0\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$		2	3	$\Omega$
<b>SWITCHING PARAMETERS</b>						
Total Gate Charge	$Q_G$	$V_{DS} = -15\text{V}, V_{GS} = -10\text{V}, I_D = -12\text{A}$		37.2	45	nC
Gate Source Charge	$Q_{GS}$			7		
Gate Drain Charge	$Q_{GD}$			10.4		
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DS} = -15\text{V}, V_{GS} = -10\text{V}, R_L = 1.25\Omega, R_{GEN} = 3\Omega$		12.4		ns
Turn-ON Rise Time	$t_R$			8.2		
Turn-OFF Delay Time	$t_{D(OFF)}$			25.6		
Turn-OFF Fall-Time	$t_F$			12		
<b>SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
Drain-Source Diode Forward Voltage	$V_{SD}$	$I_S = -1\text{A}, V_{GS} = 0\text{V}$		-0.72	-1	V
Maximum Continuous Drain-Source Diode Forward Current	$I_S$				-4.2	A
Body Diode Reverse Recovery Time	$t_{rr}$	$I_F = -12\text{A}, dI/dt = 100\text{A}/\mu\text{s}$		33	40	ns
Body Diode Reverse Recovery Charge	$Q_{rr}$	$I_F = -12\text{A}, dI/dt = 100\text{A}/\mu\text{s}$		23		nC

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