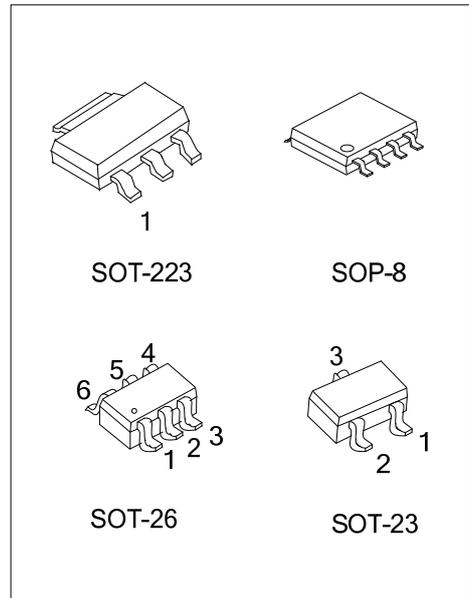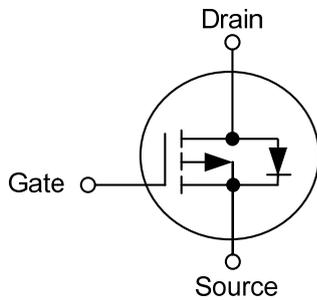# UNISONIC TECHNOLOGIES CO., LTD

UT9435H

Power MOSFET

P-CHANNEL
ENHANCEMENT MODE

■ **DESCRIPTION**

The UTC **UT9435H** provide excellent $R_{DS(ON)}$, low gate charge and fast switching speed. It has been optimized for power management applications.
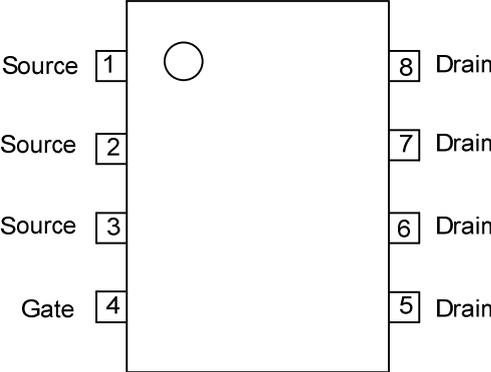
■ **SYMBOL**

Drain

Gate

Source

SOT-223   SOP-8

SOT-26   SOT-23

■ **ORDERING INFORMATION**

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UT9435HL-AA3-R	UT9435HG-AA3-R	SOT-223	G	D	S	-	-	-	-	-	Tape Reel
UT9435HL-S08-R	UT9435HG-S08-R	SOP-8	S	S	S	G	D	D	D	D	Tape Reel
UT9435HL-S08-T	UT9435HG-S08-T	SOP-8	S	S	S	G	D	D	D	D	Tube
UT9435HL-AE3-R	UT9435HG-AE3-R	SOT-23	S	G	D	-	-	-	-	-	Tape Reel
UT9435HL-AG6-R	UT9435HG-AG6-R	SOT-26	D	D	G	S	D	D	-	-	Tape Reel

UT9435HL-AA3-R

(1)Packing Type

(2)Package Type

(3)Lead Free

(1) R: Tape Reel, T: Tube

(2) AA3: SOT-223, S08: SOP-8
     AE3: SOT-23, AG6: SOT-26

(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	RATING	UNITS
Drain-Source Voltage		V_{DS}	-30	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current (Note 3) T_A=125°C		I_D	±5.3	A
Pulsed Drain Current (Note 1, 2)		I_{DM}	±20	A
Power Dissipation	SOT-223/SOP-8 (Note 4)	P_D	2.5	W
	SOT-23		0.38	
	SOT-26		0.48	
Junction Temperature		T_J	+150	°C
Storage Temperature		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	RATING	UNIT
Junction to Ambient	SOT-223/SOP-8 (Note 4)	θ_{JA}	50	°C/W
	SOT-23		325	
	SOT-26		260	

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

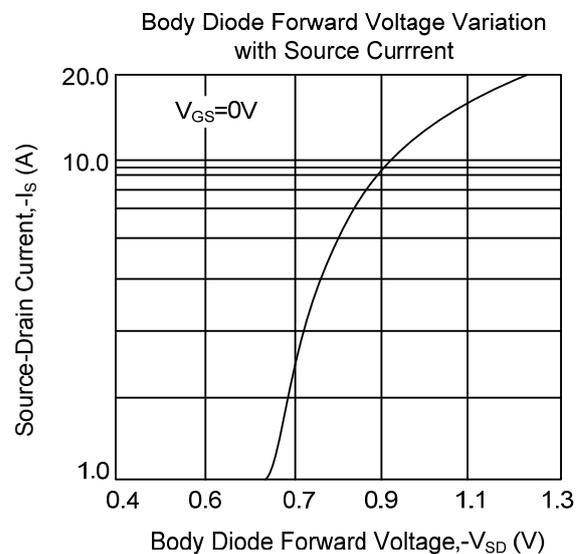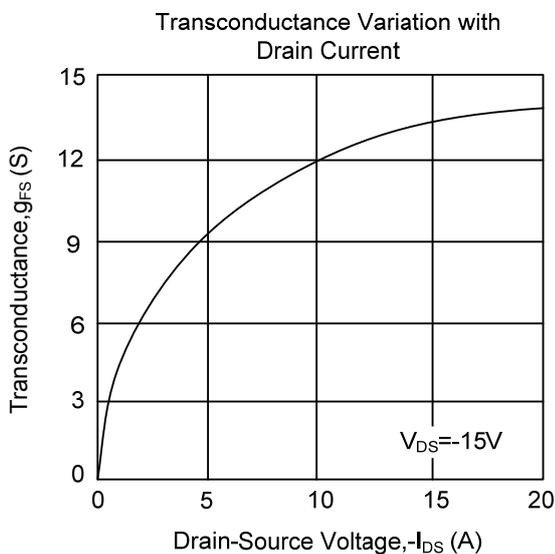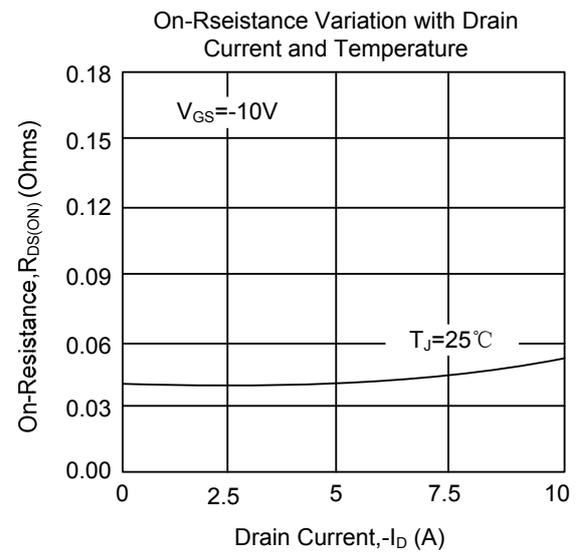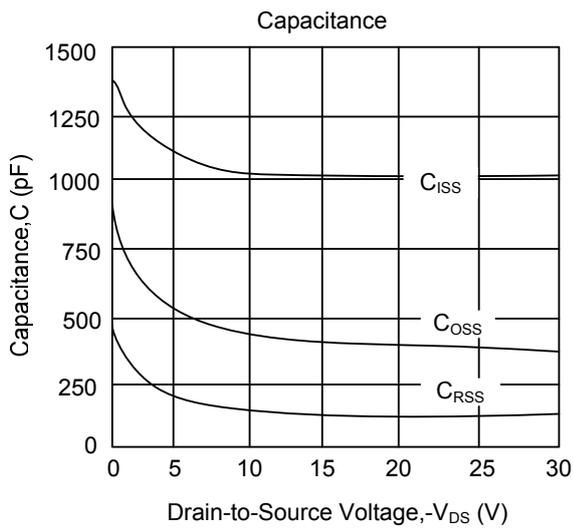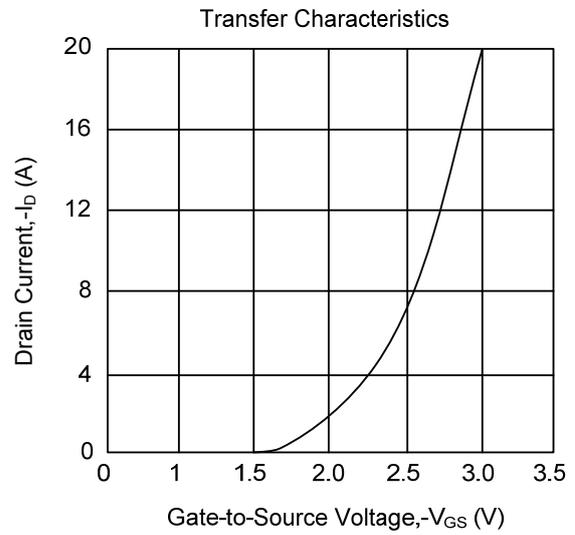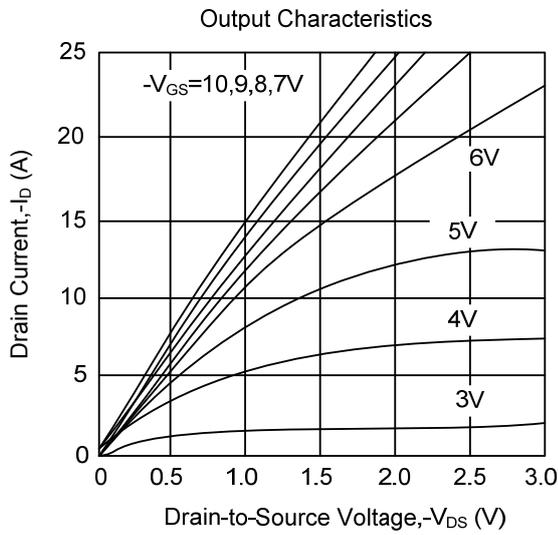| PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} =0 V, I_D =-250 µA	-30			V
Drain-Source Leakage Current	I_{DSS}	V_{DS} =-24 V, V_{GS} =0 V			-1	µA
Gate-Source Leakage Current	I_{GSS}	V_{DS} =0 V, V_{GS} = ±20V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS} =V_{GS}, I_D =-250 µA	-1		-3	V
Drain-Source On-State Resistance (Note 2)	$R_{DS(ON)}$	V_{GS} =-10V, I_D =-5.3A		44	50	mΩ
		V_{GS} =-4.5V, I_D =-4.2A		74	90	mΩ
On State Drain Current	$I_{D(ON)}$	V_{DS} = -5V, V_{GS} =-10V	-20			A
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	V_{DS} =-15V, V_{GS} =0V, f=1.0MHz		1040		pF
Output Capacitance	C_{OSS}			420		pF
Reverse Transfer Capacitance	C_{RSS}			150		pF
SWITCHING PARAMETERS						
Turn-ON Delay Time (Note 2)	$t_{D(ON)}$	V_{DD} =-15V, I_D=-1A, V_{GEN} =-10V, R_G =6Ω		19	26	ns
Turn-ON Rise Time	t_R			9	13	ns
Turn-OFF Delay Time	$t_{D(OFF)}$			74	105	ns
Turn-OFF Fall Time	t_F			36	50	ns
Total Gate Charge (Note 2)	Q_G	V_{DS} =-15V, V_{GS} =-10V, I_D =-4.6A		22.5	29	nC
Gate-Source Charge	Q_{GS}			2		nC
Gate-Drain Charge	Q_{GD}			6		nC
DRAIN-SOURCE DIODE CHARACTERISTICS						
Drain-Source Diode Forward Voltage(Note 2)	V_{SD}	V_{GS} =0V, I_S =-5.3A		-0.84	-1.3	V

Notes: 1. Pulse width limited by $T_{J(MAX)}$
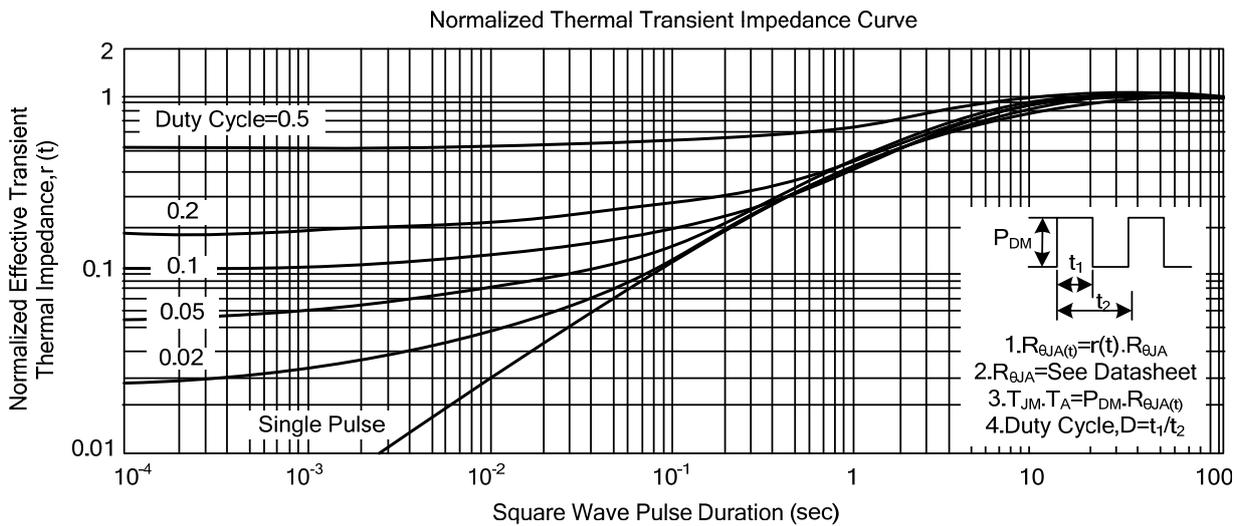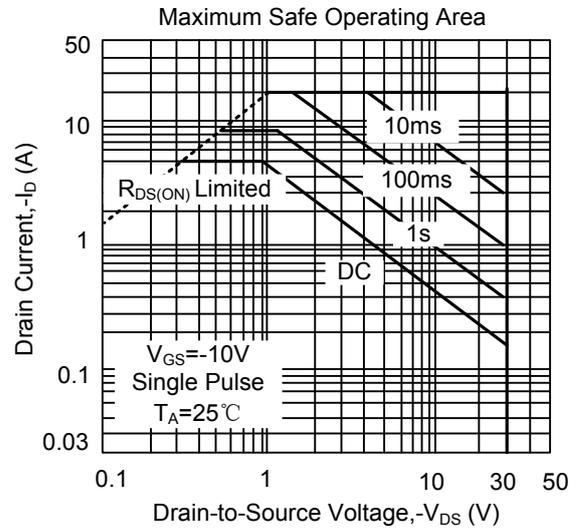2. Pulse width ≤300us, duty cycle ≤2%.
3. Surface mounted on 1 in^2 copper pad of FR4 board
4. When mounted on 1 inch square copper board.

UT9435H

Power MOSFET

■ **TYPICAL CHARACTERISTICS**

Output Characteristics

Transfer Characteristics

Capacitance

On-Rseistance Variation with Drain Current and Temperature

Transconductance Variation with Drain Current

Body Diode Forward Voltage Variation with Source Currrent

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

■ **TYPICAL CHARACTERISTICS(Cont.)**

Gate Charge

$V_{DS}=-15V$
$I_D=-5.3A$

Gate-to-Source Voltage,V_{GS} (V)

Total Gate Charge,Q_G (nC)

Maximum Safe Operating Area

Drain Current,$-I_D$ (A)

$R_{DS(ON)}$ Limited

10ms
100ms
1s
DC

$V_{GS}=-10V$
Single Pulse
$T_A=25°C$

Drain-to-Source Voltage,$-V_{DS}$ (V)

Normalized Thermal Transient Impedance Curve

Normalized Effective Transient Thermal Impedance,r (t)

Duty Cycle=0.5
0.2
0.1
0.05
0.02
Single Pulse

Square Wave Pulse Duration (sec)

P_{DM}
t_1
t_2

1. $R_{θJA(t)}=r(t)·R_{θJA}$
2. $R_{θJA}$=See Datasheet
3. $T_{JM}-T_A=P_{DM}·R_{θJA(t)}$
4. Duty Cycle,D=t_1/t_2