



**UNISONIC TECHNOLOGIES CO., LTD**

## UT2305-H

*Power MOSFET*

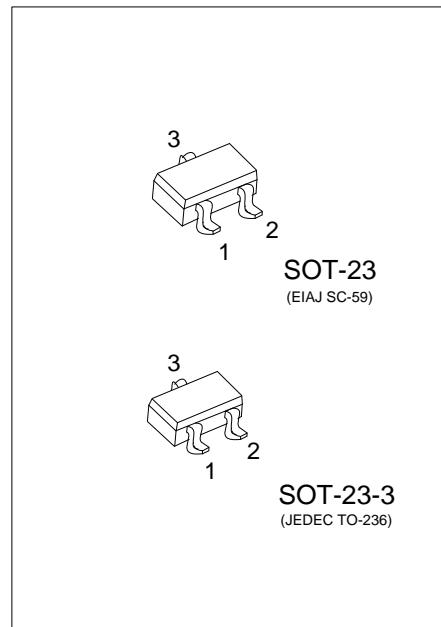
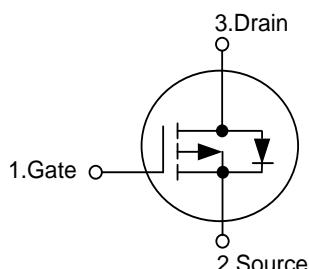
### 4.2A, 20V P-CHANNEL POWER MOSFET

#### ■ DESCRIPTION

The UTC UT2305-H is P-channel enhancement mode power MOSFET, designed in serried ranks. With fast switching speed, low on-resistance, favorable stabilization.

Used in commercial and industrial surface mount applications and suited for low voltage applications such as DC/DC converters.

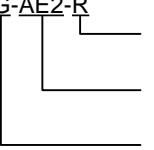
#### ■ SYMBOL



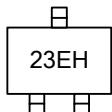
#### ■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UT2305L-AE2-R	UT2305G-AE2-R	SOT-23-3	G	S	D	Tape Reel
UT2305L-AE3-R	UT2305G-AE3-R	SOT-23	G	S	D	Tape Reel

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

 (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
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#### ■ MARKING



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

PARAMETER		SYMBOL	RATING	UNITS
Drain-Source Voltage		$V_{DS}$	-20	V
Gate-Source Voltage		$V_{GS}$	$\pm 10$	V
Continuous Drain Current (Note 3) ( $T_A=25^\circ\text{C}$ )		$I_D$	-4.2	A
Pulsed Drain Current (Note 1, 2)		$I_{DM}$	-10	A
Power Dissipation ( $T_A=25^\circ\text{C}$ )	SOT-23-3	$P_D$	0.83	W
	SOT-23		1	W
Junction Temperature		$T_J$	+150	$^\circ\text{C}$
Storage Temperature		$T_{STG}$	-55 ~ +150	$^\circ\text{C}$

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 CHARACTERISTICS

PARAMETER		SYMBOL	RATING	UNIT
Junction to Ambient	SOT-23-3	$\theta_{JA}$	150	$^\circ\text{C}/\text{W}$
	SOT-23		125	$^\circ\text{C}/\text{W}$

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

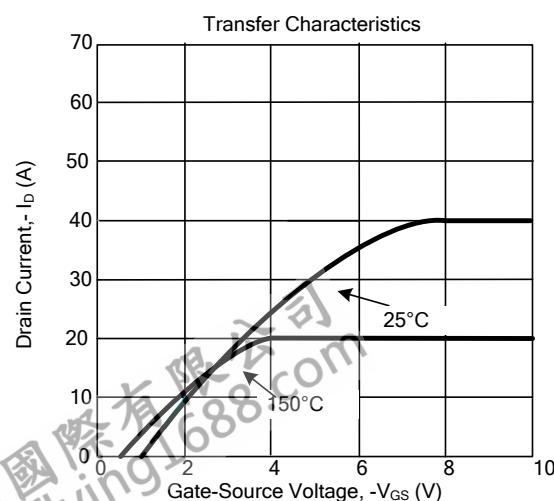
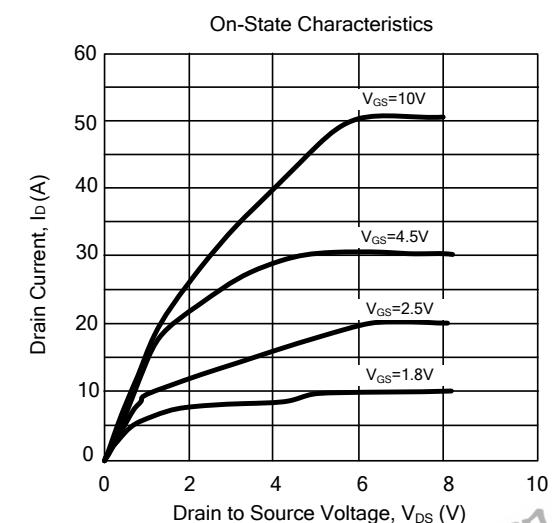
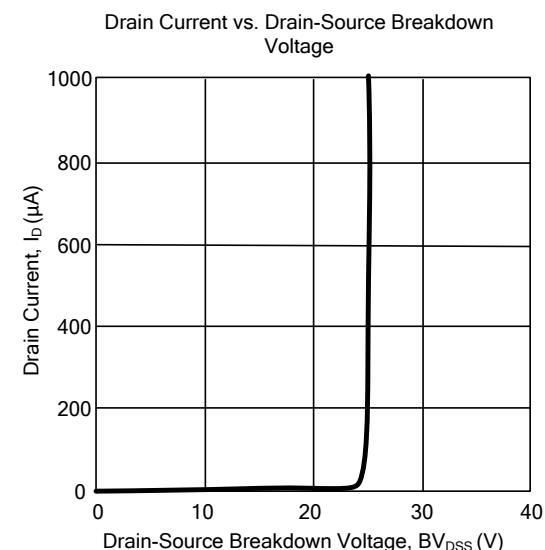
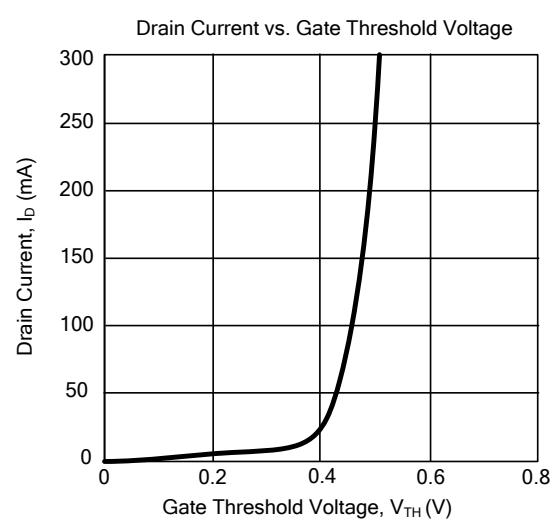
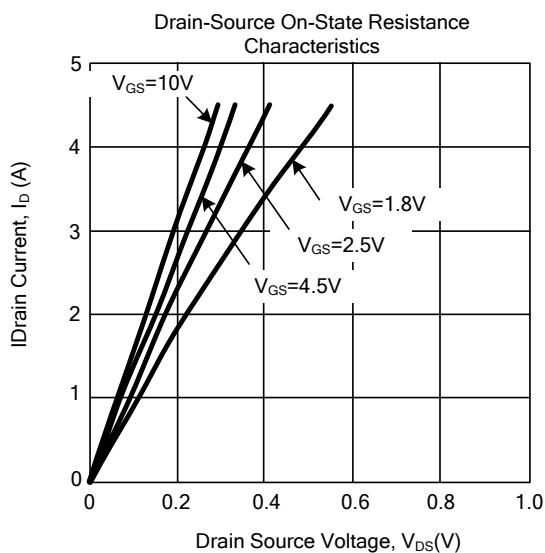
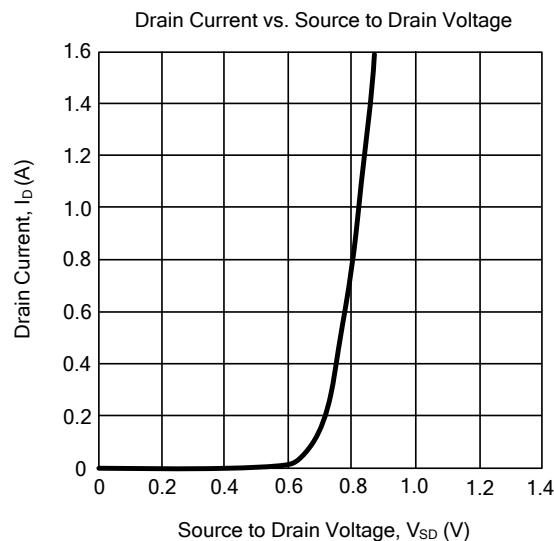
■ ELECTRICAL CHARACTERISTICS ( $T_J=25^\circ\text{C}$ , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0\text{V}, I_D=-250\mu\text{A}$	-20			V
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=-20\text{V}, V_{GS}=0\text{V}$			-1	$\mu\text{A}$
		$V_{DS}=-16\text{V}, V_{GS}=0\text{V}$			-30	$\mu\text{A}$
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 10\text{V}, V_{DS}=0\text{V}$			$\pm 100$	nA
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to $25^\circ\text{C}$ , $I_D=-1\text{mA}$		-0.1		$\text{V}/^\circ\text{C}$
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	$V_{GS(\text{TH})}$	$V_{DS}=V_{GS}, I_D=-250\mu\text{A}$	-0.4		-0.9	V
Drain-Source On-State Resistance (Note 2)	$R_{DS(\text{ON})}$	$V_{GS}=-4.5\text{V}, I_D=-2.8\text{A}$		58	75	$\text{m}\Omega$
		$V_{GS}=-2.5\text{V}, I_D=-2.4\text{A}$		75	95	$\text{m}\Omega$
		$V_{GS}=-1.8\text{V}, I_D=-1.7\text{A}$		95	120	$\text{m}\Omega$
<b>DYNAMIC CHARACTERISTICS</b>						
Input Capacitance	$C_{ISS}$	$V_{GS}=0\text{V}, V_{DS}=-15\text{V}, f=1\text{MHz}$		515		pF
Output Capacitance	$C_{OSS}$			55		pF
Reverse Transfer Capacitance	$C_{RSS}$			20		pF
<b>SWITCHING CHARACTERISTICS</b>						
Total Gate Charge (Note 2)	$Q_G$	$V_{DS}=-16\text{V}, V_{GS}=-4.5\text{V}, I_D=-4.2\text{A}$		6.4		nC
Gate-Source Charge	$Q_{GS}$			0.9		nC
Gate-Drain Charge	$Q_{GD}$			1.6		nC
Turn-ON Delay Time (Note 2)	$t_{D(\text{ON})}$	$V_{DS}=-15\text{V}, V_{GS}=-10\text{V}, I_D=-1\text{A}, R_G=6\Omega, R_D=15\Omega$		12		ns
Turn-ON Rise Time	$t_R$			36		ns
Turn-OFF Delay Time	$t_{D(\text{OFF})}$			326		ns
Turn-OFF Fall Time	$t_F$			200		ns
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
Drain-Source Diode Forward Voltage (Note 2)	$V_{SD}$	$V_{GS}=0\text{V}, I_S=-1.2\text{A}$			-1.2	V
Reverse Recovery Time	$t_{rr}$	$V_{GS}=0\text{V}, I_S=-4.2\text{A}, dI/dt=100\text{A}/\mu\text{s}$		27.7		ns
Reverse Recovery Charge	$Q_{RR}$			22		nC

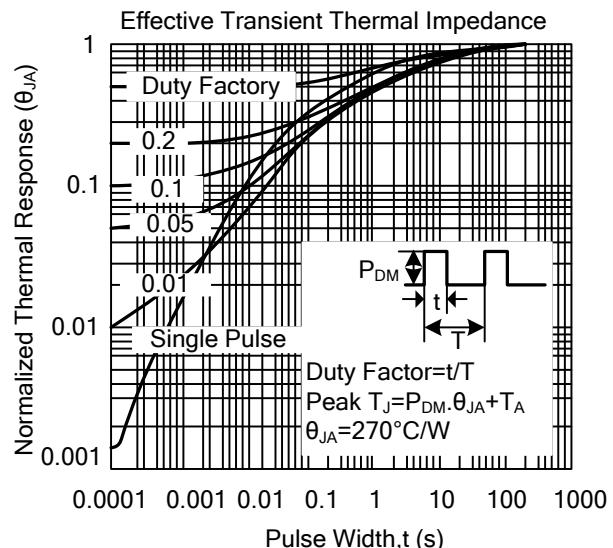
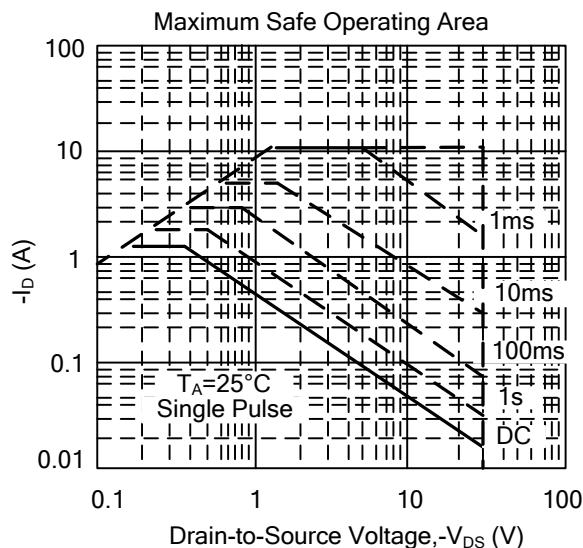
Notes: 1. Repetitive rating, pulse width limited by junction temperature.

2. Pulse width  $\leq 300\mu\text{s}$ , duty cycle  $\leq 2\%$ .

## ■ TYPICAL CHARACTERISTICS



## ■ TYPICAL CHARACTERISTICS (Cont.)



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