



## UT70P02

Power MOSFET

### P-CHANNEL ENHANCEMENT MODE POWER MOSFET

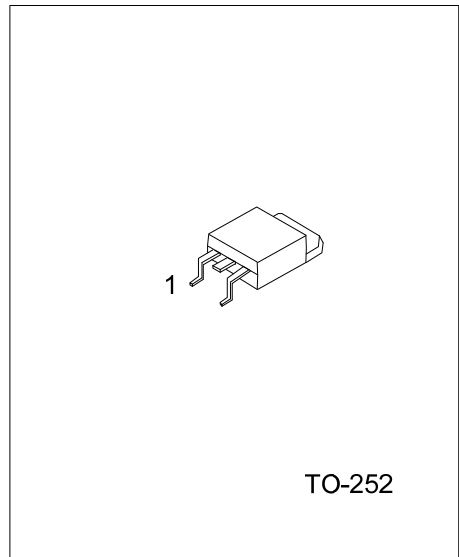
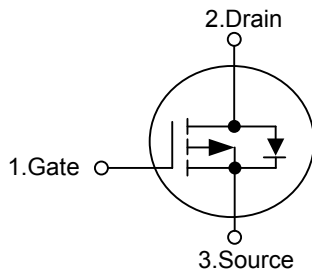
#### DESCRIPTION

The **UT70P02** uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with low gate voltages. This device is suitable for use as a load switch or in PWM applications.

#### FEATURES

- \*  $R_{DS(ON)} = 6m\Omega @ V_{GS} = -10V$
- \* Low capacitance
- \* Low gate charge
- \* Fast switching capability
- \* Avalanche energy specified

#### SYMBOL



\*Pb-free plating product number: UT70P02L

#### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Normal	Lead Free Plating		1	2	3	
UT70P02-TN3-R	UT70P02L-TN3-R	TO-252	G	D	S	Tape Reel
UT70P02-TN3-T	UT70P02L-TN3-T	TO-252	G	D	S	Tube

<p>UT70P02L-TN3-R</p> <p>(1)Packing Type</p> <p>(2)Package Type</p> <p>(3)Lead Plating</p>	<p>(1) R: Tape Reel, T: Tube</p> <p>(2) TN3: TO-252</p> <p>(3) L: Lead Free Plating, Blank: Pb/Sn</p>
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■ ABSOLUTE MAXIMUM RATINGS ( $T_A=25^{\circ}\text{C}$  unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	$V_{DSS}$	-25	V
Gate-Source Voltage	$V_{GSS}$	$\pm 20$	V
Continuous Drain Current, $V_{GS}=4.5\text{V}$	$I_D$	-75	A
Pulsed Drain Current (Note 1)	$I_{DM}$	-350	A
Power Dissipation @ $T_C=25^{\circ}\text{C}$	$P_D$	107	W
Junction Temperature	$T_J$	+175	$^{\circ}\text{W}/^{\circ}\text{C}$
Strong Temperature	$T_{STG}$	-55 ~ +175	$^{\circ}\text{C}$

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 DATA

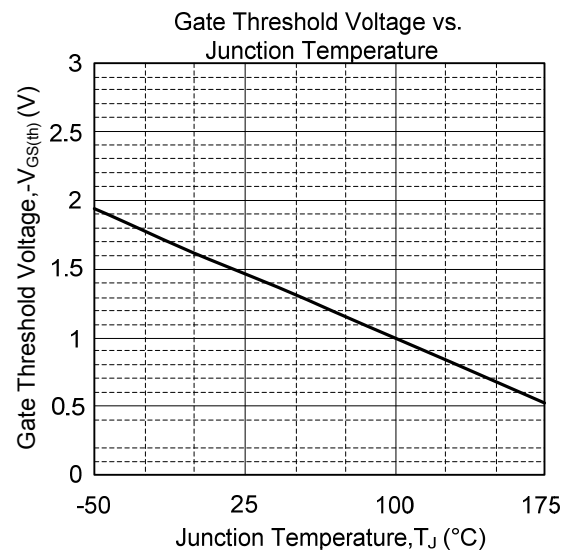
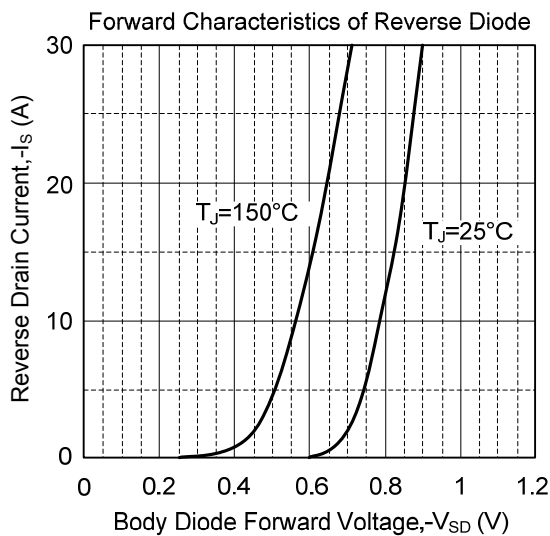
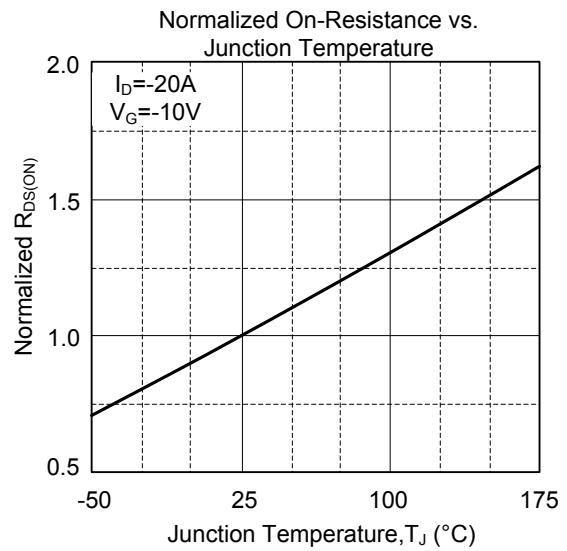
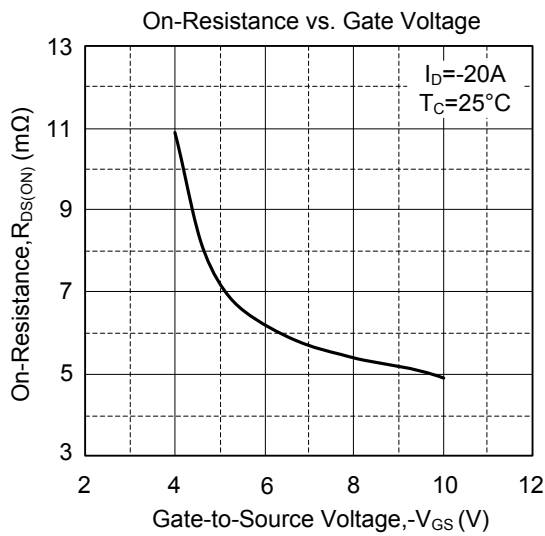
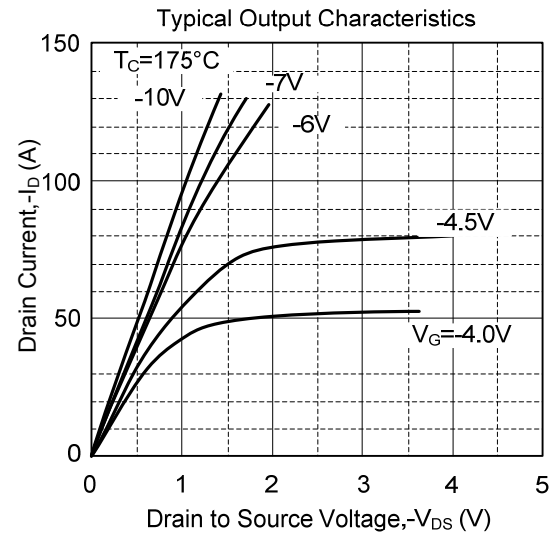
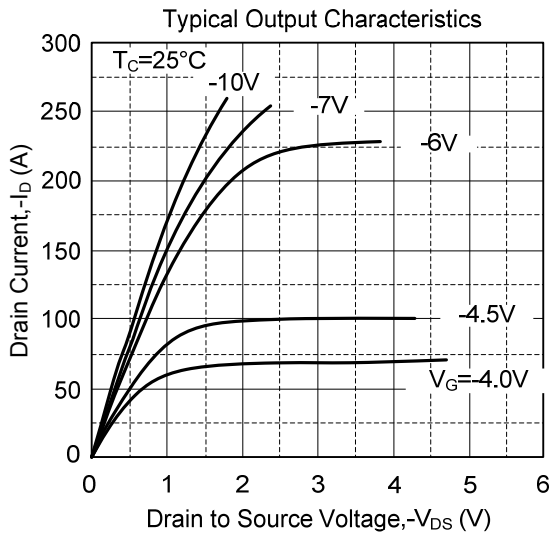
PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Junction-to-Ambient	$\theta_{JA}$			110	$^{\circ}\text{C}/\text{W}$
Junction-to-Case	$\theta_{JC}$			1.4	$^{\circ}\text{C}/\text{W}$

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

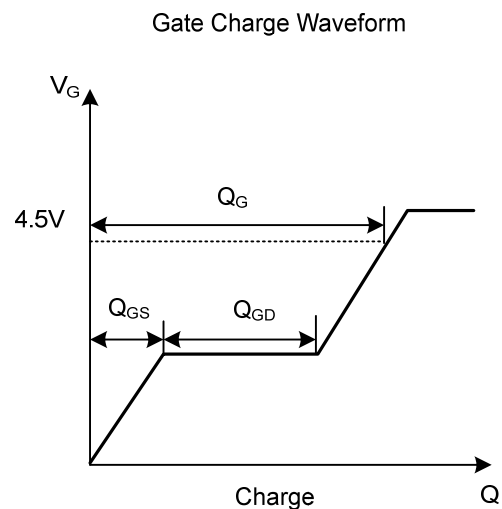
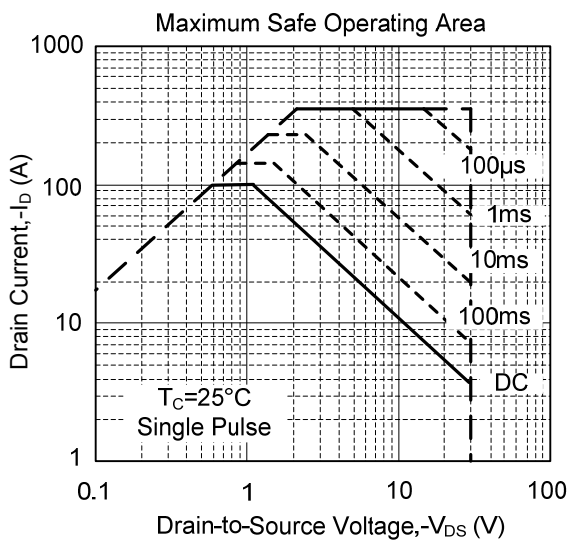
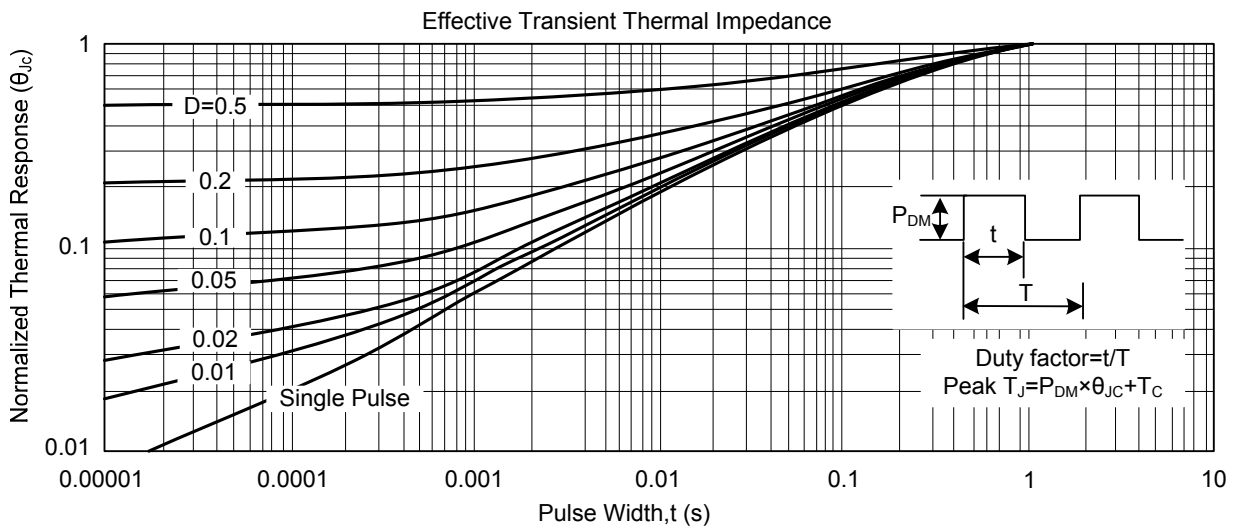
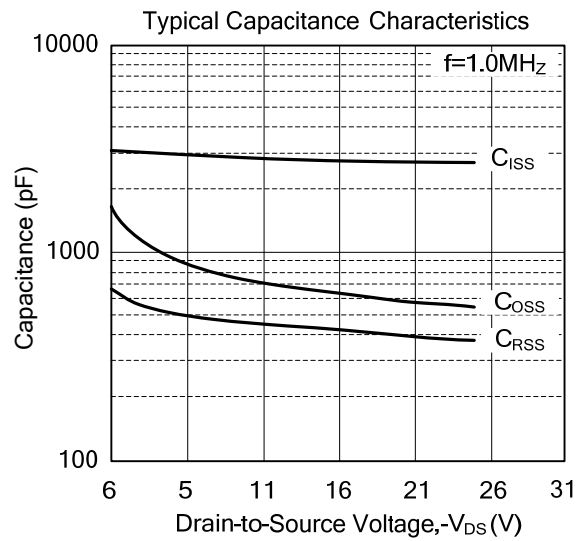
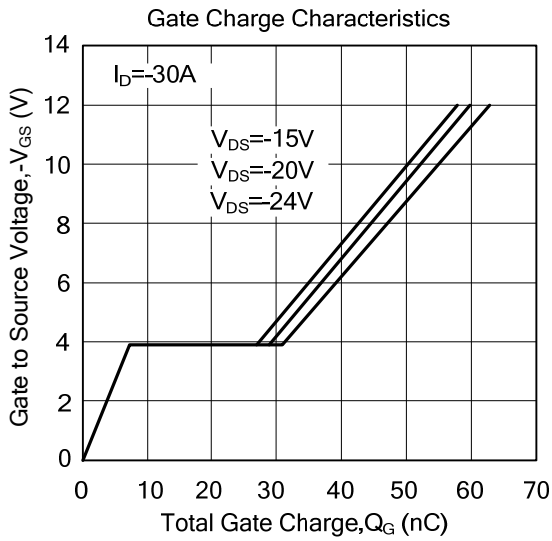
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0\text{V}, I_D=-250\mu\text{A}$	-25			V
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to $25^{\circ}\text{C}, I_D=-1\text{mA}$		-0.018		$\text{V}/^{\circ}\text{C}$
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=-30\text{V}, V_{GS}=0\text{V}, T_J=25^{\circ}\text{C}$			-1	$\mu\text{A}$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20\text{V}$			$\pm 100$	nA
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=-250\mu\text{A}$	-1		-3	V
Static Drain-Source On-Resistance (Note 2)	$R_{DS(ON)}$	$V_{GS}=-10\text{V}, I_D=-10\text{A}$ $V_{GS}=-4.5\text{V}, I_D=-10\text{A}$			7 10	m $\Omega$
<b>DYNAMIC PARAMETERS</b>						
Input Capacitance	$C_{ISS}$	$V_{DS}=-25\text{V}, V_{GS}=0\text{V}, f=1.0\text{MHz}$		2700	4200	pF
Output Capacitance	$C_{OSS}$			550		pF
Reverse Transfer Capacitance	$C_{RSS}$			380		pF
<b>SWITCHING PARAMETERS</b>						
Total Gate Charge(Note 2)	$Q_G$	$V_{DS}=-24\text{V}, V_{GS}=-4.5\text{V}, I_D=-30\text{A}$		33	52	nC
Gate Source Charge	$Q_{GS}$			7.5		nC
Gate Drain ("Miller") Charge	$Q_{GD}$			24		nC
Turn-ON Delay Time(Note 2)	$t_{D(ON)}$	$V_{GS}=-10\text{V}, V_{DS}=-15\text{V}, R_D=0.5\Omega, I_D=-30\text{A}, R_G=3.3\Omega$		11.2		ns
Turn-ON Rise Time	$t_R$			77		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			35		ns
Turn-OFF Fall-Time	$t_F$			67		ns
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
Forward On Voltage(Note 2)	$V_{SD}$	$I_S=-10\text{A}, V_{GS}=0\text{V}$			-1.3	V
Reverse Recovery Time	$t_{RR}$	$I_S=-30\text{A}, V_{GS}=0\text{V}$		28		ns
Reverse Recovery Charge	$Q_{RR}$	$di/dt=100\text{A}/\mu\text{s}$		10		nC

Notes: 1.Pulse width limited by safe operating area.  
2.Pulse width  $\leq 300\mu\text{s}$ , duty cycle  $\leq 2\%$ .

## TYPICAL CHARACTERISTICS



## ■ TYPICAL CHARACTERISTICS(Cont.)



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