



UT70P02

Power MOSFET

P-CHANNEL ENHANCEMENT MODE POWER MOSFET

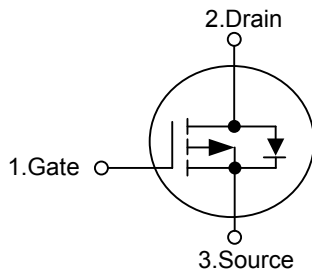
■ DESCRIPTION

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

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

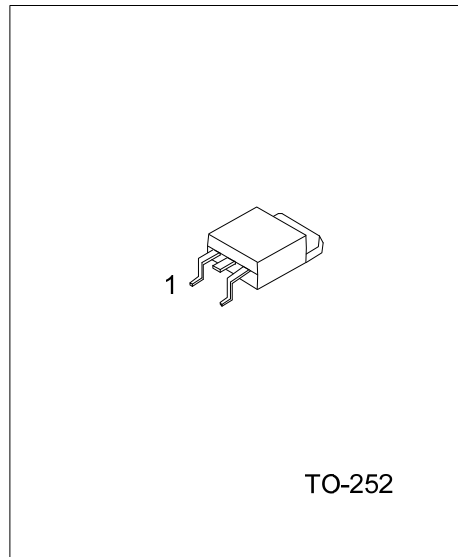
■ SYMBOL



■ 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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TO-252

*Pb-free plating product number: UT70P02L

■ 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}	± 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	$W/^\circ\text{C}$
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

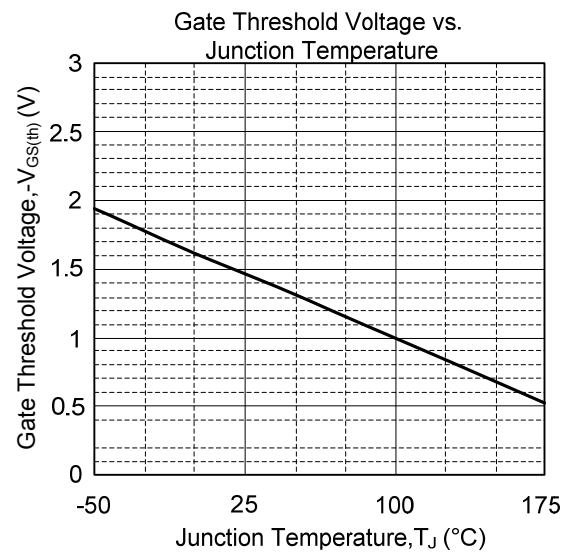
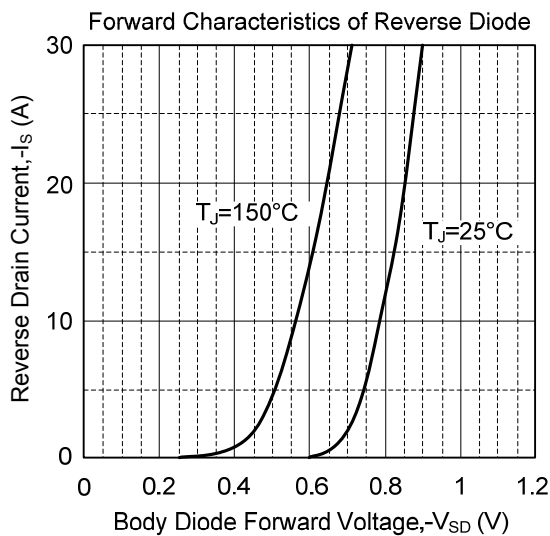
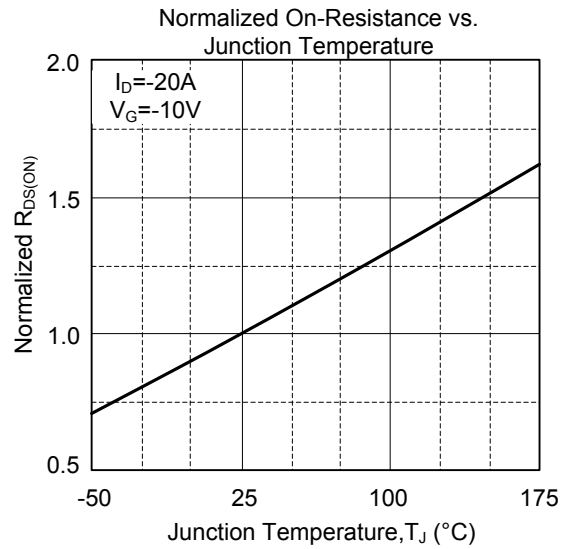
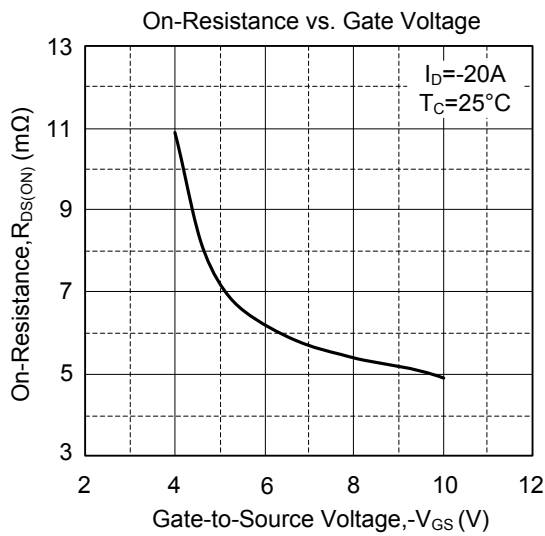
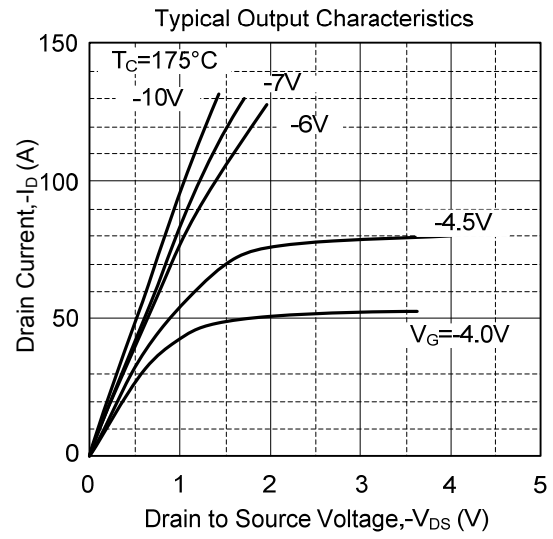
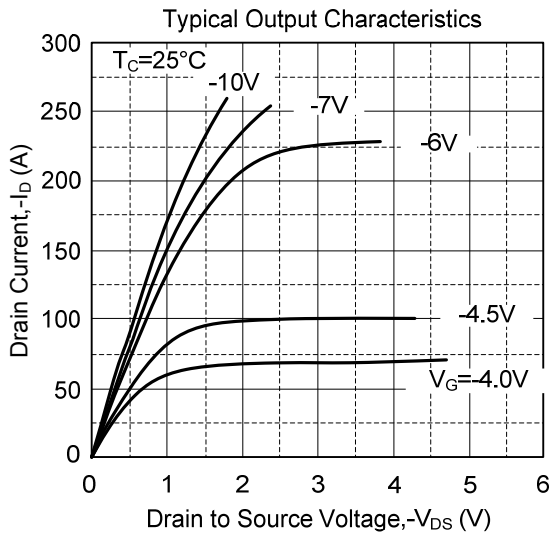
PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Junction-to-Ambient	θ_{JA}			110	$^\circ\text{C}/\text{W}$
Junction-to-Case	θ_{JC}			1.4	$^\circ\text{C}/\text{W}$

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

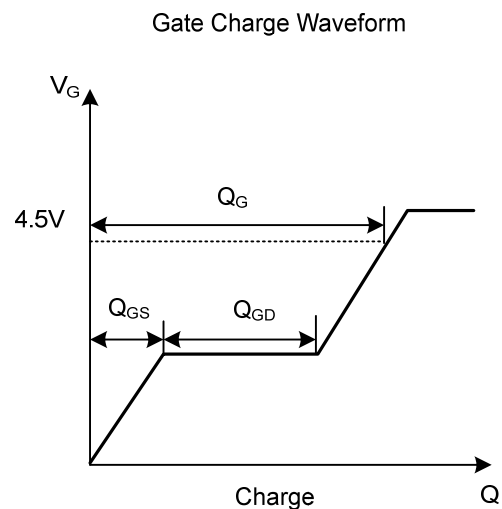
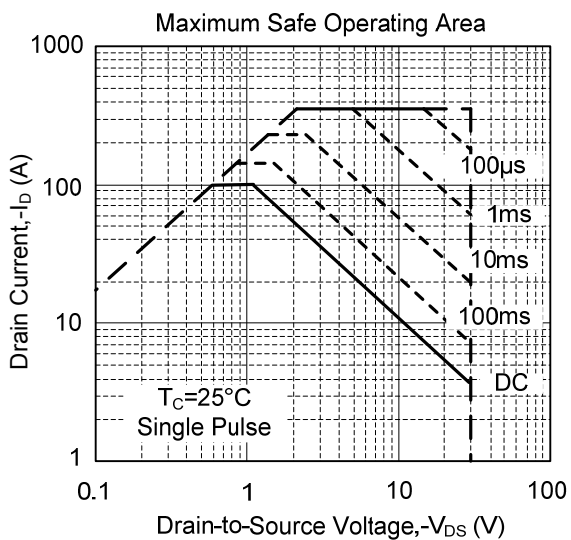
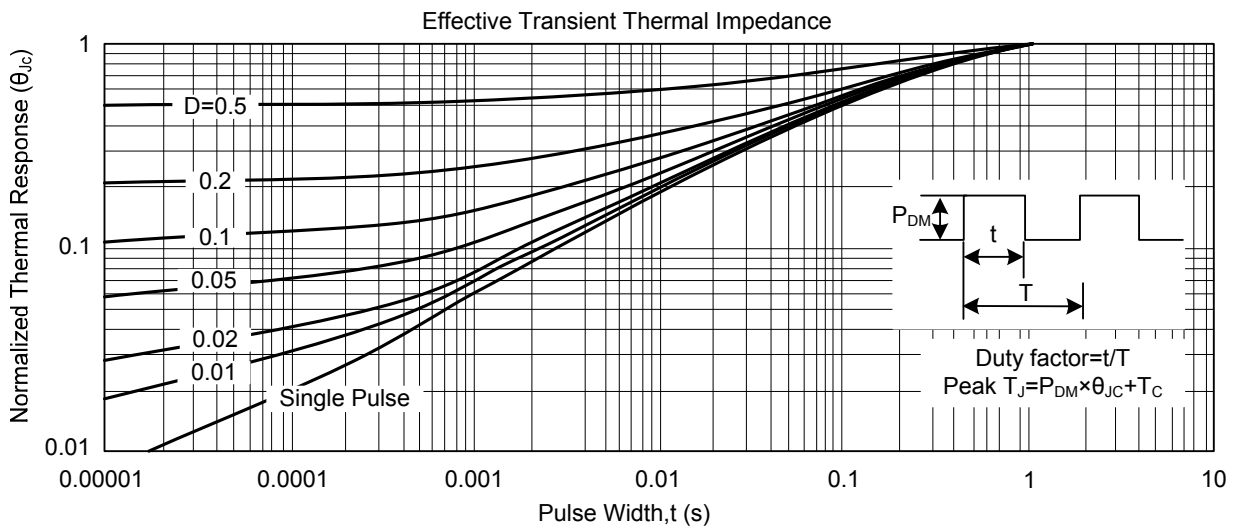
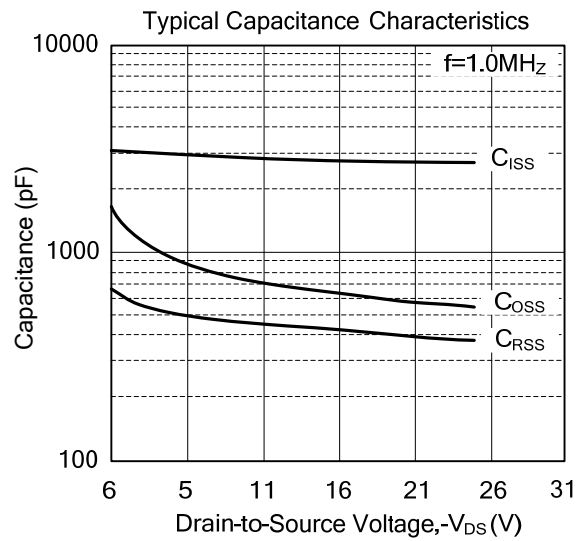
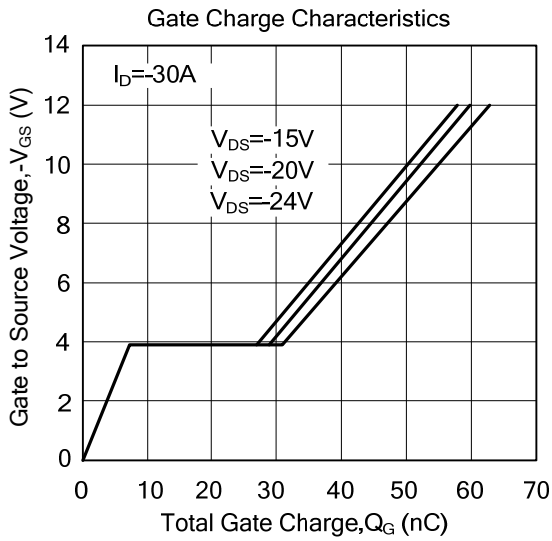
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0\text{V}, I_D=-250\ \mu\text{A}$	-25			V
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to $25^\circ\text{C}, I_D=-1\text{mA}$		-0.018		$V/^\circ\text{C}$
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=-30\text{V}, V_{GS}=0\text{V}, T_J=25^\circ\text{C}$			-1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20\text{V}$			± 100	nA
ON CHARACTERISTICS						
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 Ω
DYNAMIC PARAMETERS						
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
SWITCHING PARAMETERS						
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
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
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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