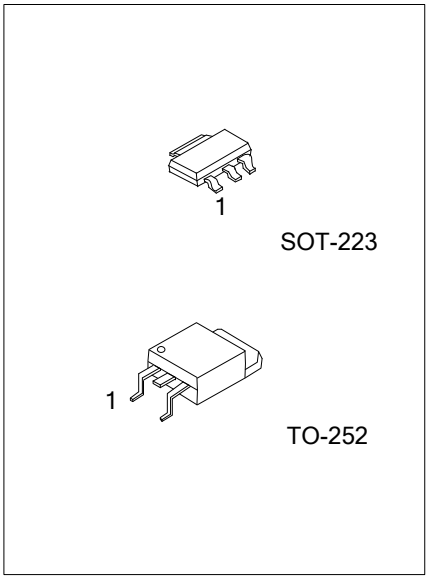
UTD410

Power MOSFET

N-CHANNEL ENHANCEMENT MODE



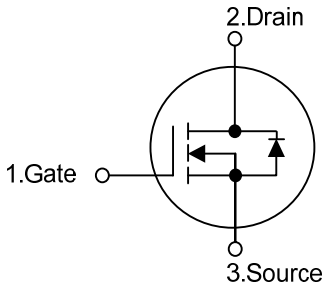
■ DESCRIPTION

The **UTD410** can provide excellent $R_{DS(ON)}$ and low gate charge by using advanced trench technology. This **UTD410** is suitable for using as a load switch or in PWM applications.

■ FEATURES

* V_{DS}=30V, I_D=8A
* $R_{DS(ON)}$ =48mΩ @V_{GS} =10V

■ SYMBOL



■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTD410L-TN3-R UT	D410G-TN3-R	TO-252	G	D	S	Tape Reel
UTD410L-TN3-T UT	D410G-TN3-T	TO-252	G	D	S	Tube
UTD410L-AA3-R UT	D410G-AA3-R	SOT-223	G	D	S	Tape Reel

UTD410L-TN3-R (1)Packing Type (2)Package Type (3)Lead Plating	(1) R: Tape Reel, T: Tube (2) TN3: TO-252, AA3: SOT-223 (3) L: Lead Free, G: Halogen Free

■ ABSOLUTE MAXIMUM RATINGS (T_A=25°C, unless otherwise specified)

PARAMETER SYMBOL			RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	30	V
Gate-Source Voltage		V_{GSS}	±20	
Continuous Drain Current		I_D 8		A
Pulsed Drain Current (Note1)		I_{DM} 20		
Repetitive Avalanche Energy (L=0.1mH Note1)		E_{AR} 10		mJ
Power Dissipation (T_C=25°C)	TO-252	P_D	2	W
	SOT-223		2.3	
Junction Temperature		T_J	+175	°C
Storage Temperature		T_{STG}	-55 ~ +175	°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 (T_C=25°C)	TO-252	θ_{JA}	46		60	°C/W
	SOT-223				55	°C/W

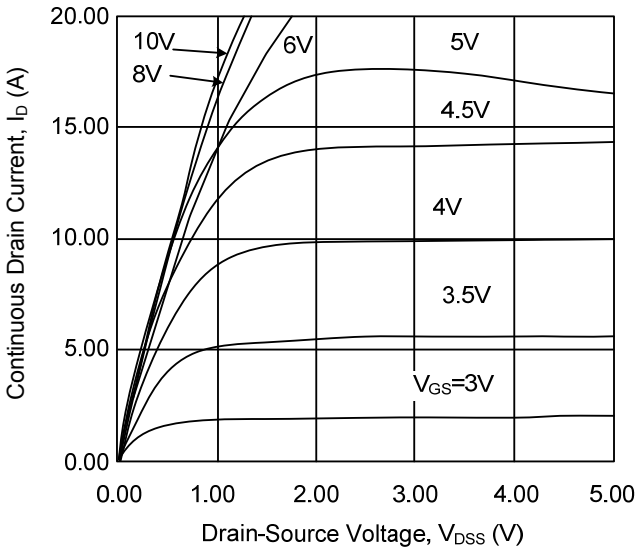
■ ELECTRICAL CHARACTERISTICS (T_J =25°C, unless otherwise specified)

PARAMETER SYMBOL		TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} =0 V, I_D =250μA	30		V	
Drain-Source Leakage Current	I_{DSS}	V_{DS} =24V,V_{GS} =0V			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 =250μA	1	1.8	3	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D =8A		48	65	mΩ
		V_{GS}=4.5V, I_D =2A		75	105	
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{ISS}	V_{DS} =15 V, V_{GS} =0V, f=1MHz	288			pF
Output Capacitance	C_{OSS}			57		pF
Reverse Transfer Capacitance	C_{RSS}			39		pF
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	$t_{D(ON)}$	V_{GS}=10V,V_{DD}=15V, R_L=1.8Ω, R_G=3Ω		3.7		ns
Turn-On Rise Time	t_R			3.7		ns
Turn-Off Delay Time	$t_{D(OFF)}$			15.6		ns
Turn-Off Fall-Time	t_F			2.6		ns
Total Gate Charge	Q_G	V_{GS}=10V, V_{DS}=15V, I_D=8A	6.72			nC
Gate-Source Charge	Q_{GS}			0.76		nC
Gate-Drain Charge	Q_{GD}			1.78		nC
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=1A		0.75	1	V
Maximum Continuous Drain-Source Diode Forward Current	I_S				4.3	A
Reverse Recovery Time	t_{RR}	I_F=8A, dI_F/dt=100A/μs		12.6		ns
Reverse Recovery Charge	Q_{RR}			5.1		nC

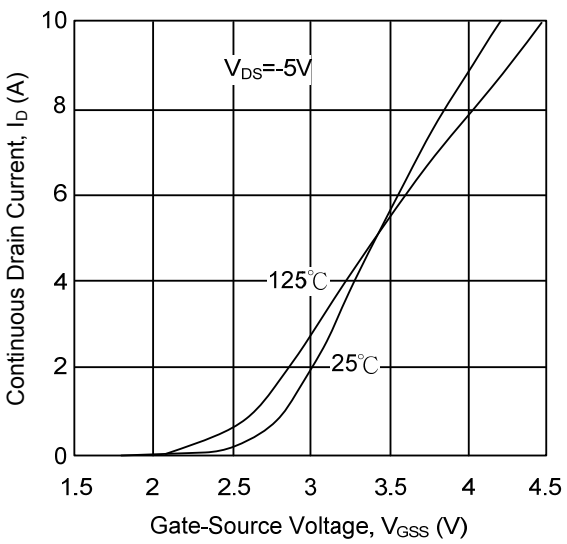
Note: 1. Pulse width limited by $T_{J(MAX)}$
2. Pulse width ≤300us, duty cycle ≤2%.
3. Surface mounted on 1 in^2 copper pad of FR4 board

■ TYPICAL CHARACTERISTICS

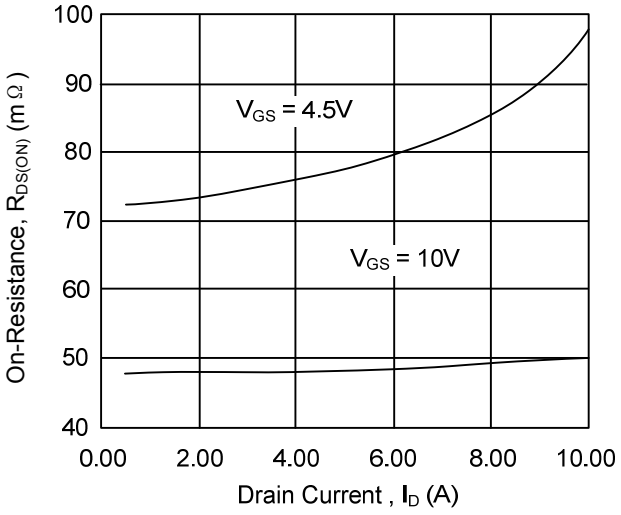
On-Region Characteristics



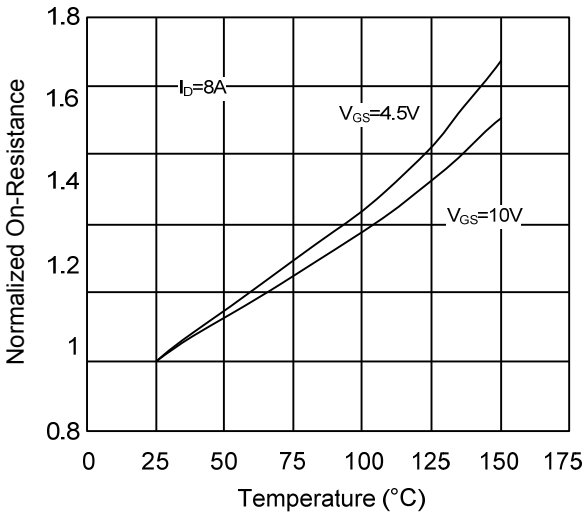
Transfer Characteristics



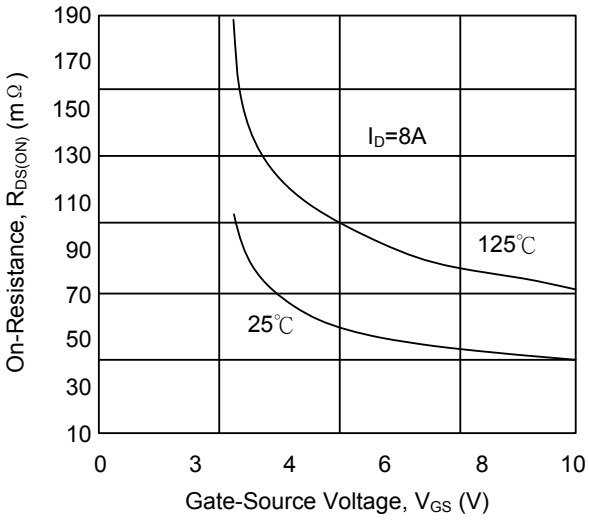
On-Resistance vs. Drain Current



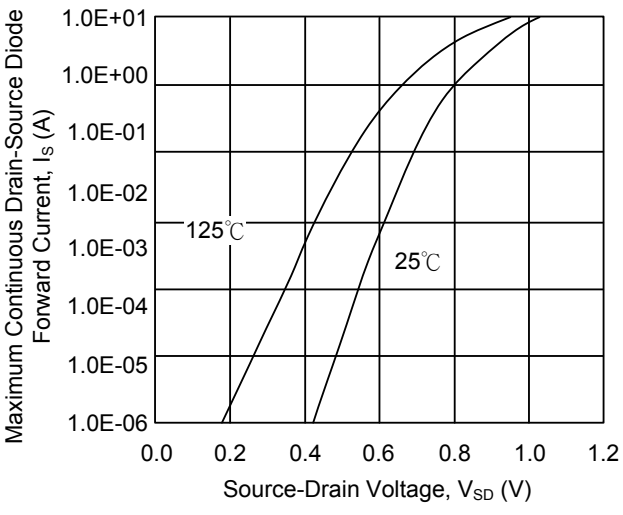
On-Resistance vs. Junction Temperature



On-Resistance vs. Gate-Source Voltage

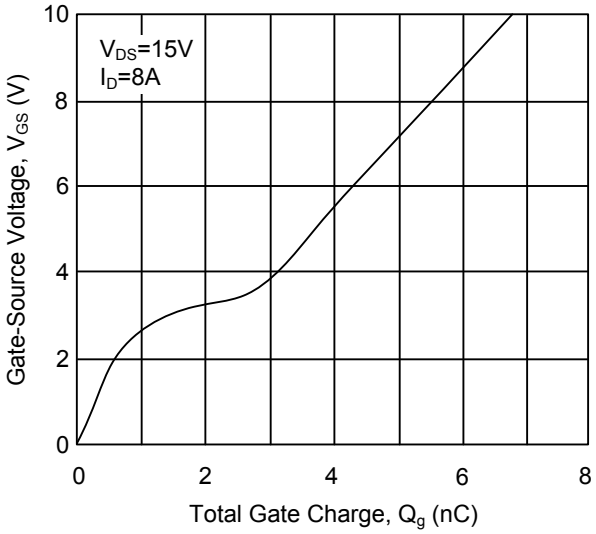


Body-Diode Characteristics

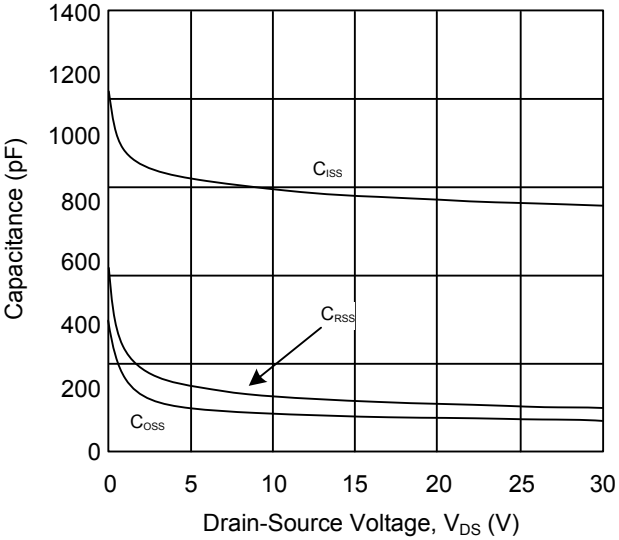


■ TYPICAL CHARACTERISTICS(Cont.)

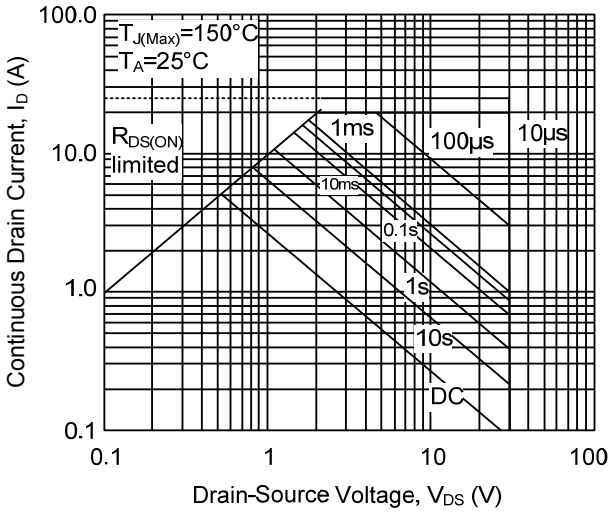
Gate-Charge Characteristics



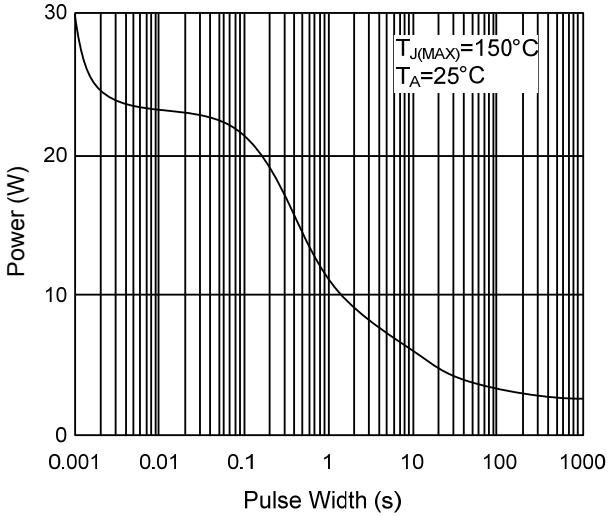
Capacitance Characteristics



Maximum Forward Biased Safe Operating Area



Single Pulse Power Rating Junction-to-Ambient



Normalized Maximum Transient Thermal Impedance