



UT4413

Power MOSFET

P-CHANNEL ENHANCEMENT MODE

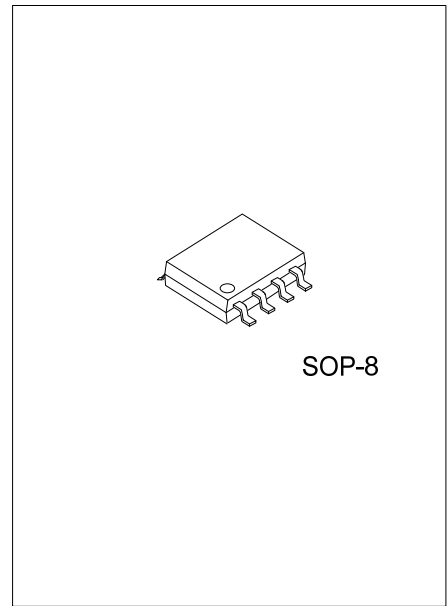
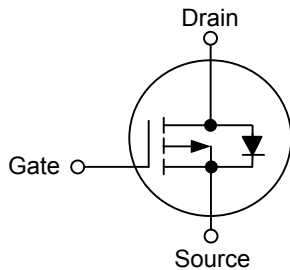
DESCRIPTION

The **UT4413** 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

- * $R_{DS(ON)} = 8.5m\Omega @ V_{GS} = -10 V$
- * Low capacitance
- * Low gate charge
- * Fast switching capability
- * Avalanche energy specified

SYMBOL



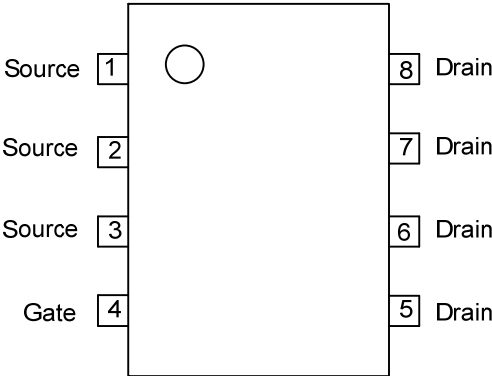
*Pb-free plating product number: UT4413L

ORDERING INFORMATION

Ordering Number		Package	Packing
Normal	Lead Free Plating		
UT4413-S08-R	UT4413L-S08-R	SOP-8	Tape Reel
UT4413-S08-T	UT4413L-S08-T	SOP-8	Tube

<p>UT4413L-S08-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) S08: SOP-8</p> <p>(3) L: Lead Free Plating, Blank: Pb/Sn</p>
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■ PIN CONFIGURATION



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

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	V_{DSS}	-30	V
Gate-Source Voltage	V_{GSS}	± 25	V
Continuous Drain Current (Note 1)	I_D	-15	A
Pulsed Drain Current (Note 2)	I_{DM}	-80	A
Power Dissipation($T_C=25^\circ\text{C}$)	P_D	3	W
Junction a Temperature	T_J	+150	$^\circ\text{C}$
Strong 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 DATA

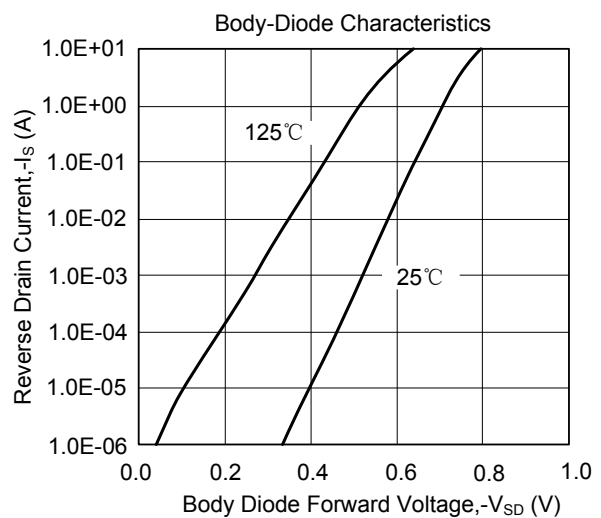
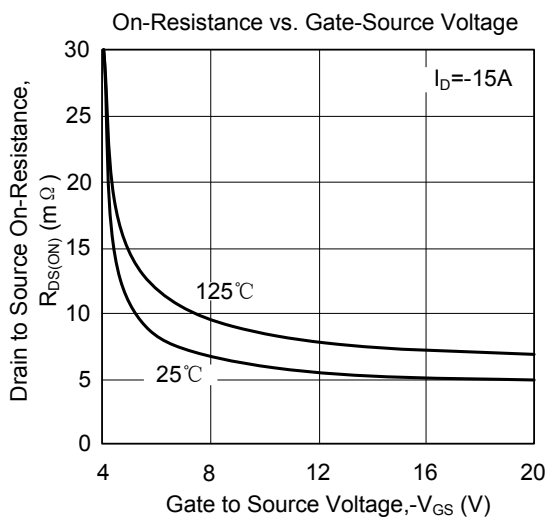
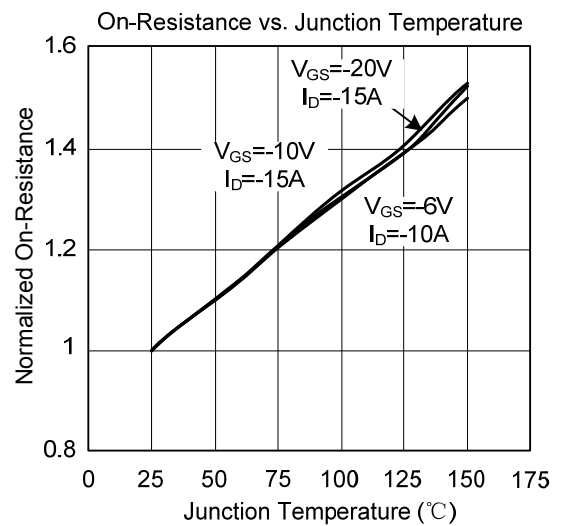
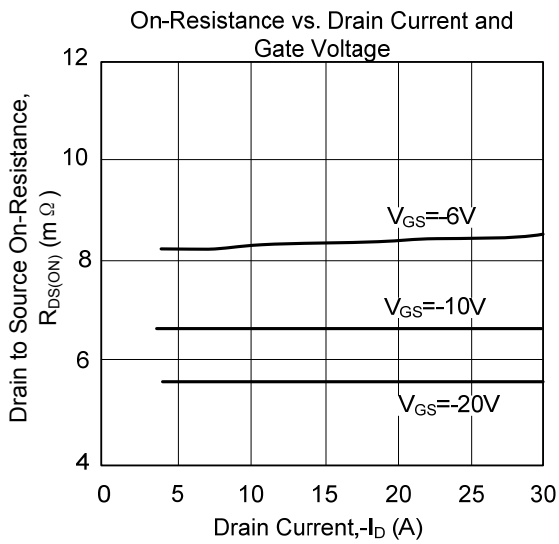
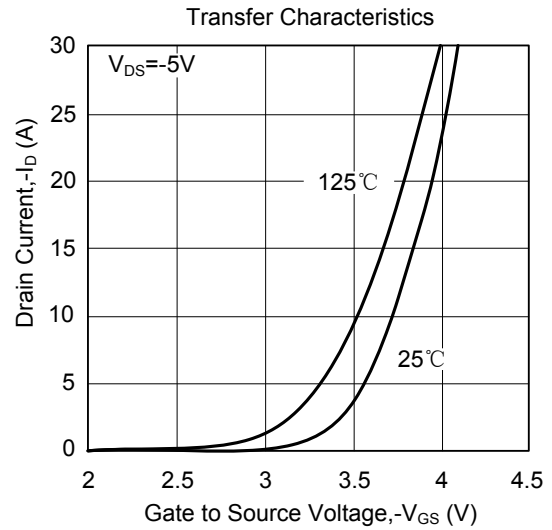
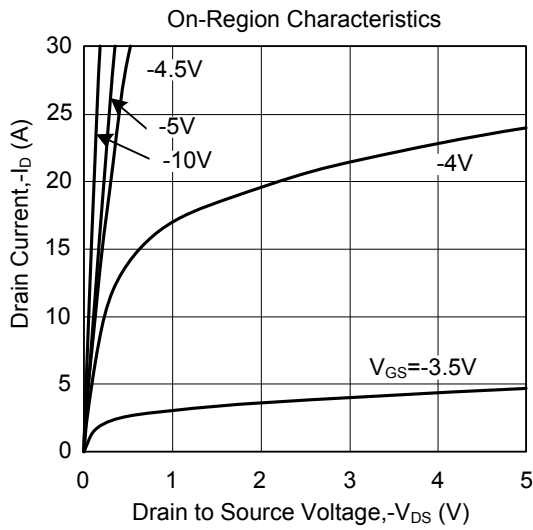
PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Junction-to-Ambient	θ_{JA}		62	75	$^\circ\text{C/W}$

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

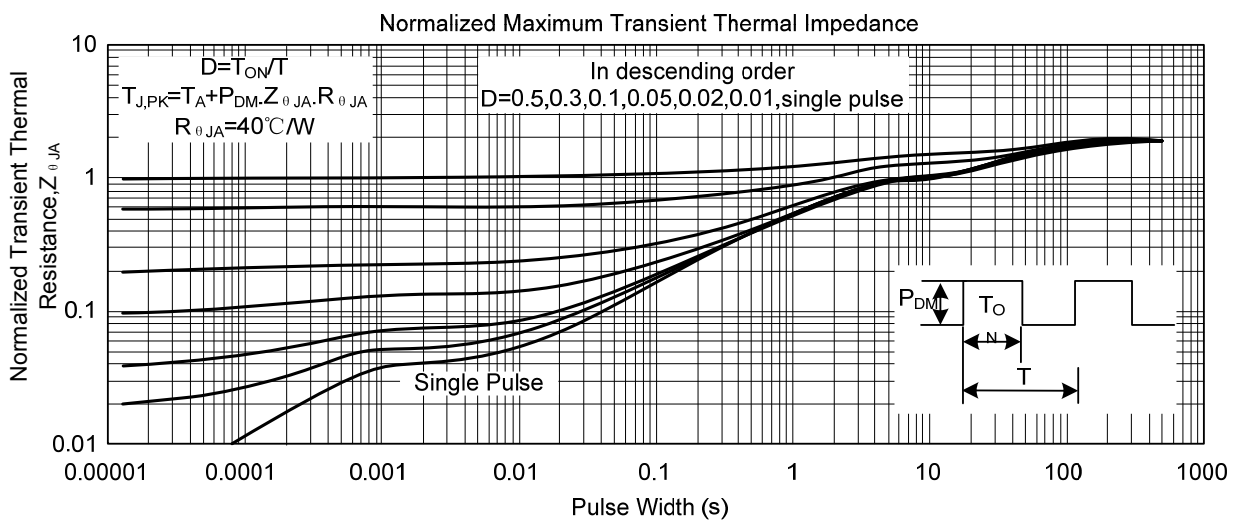
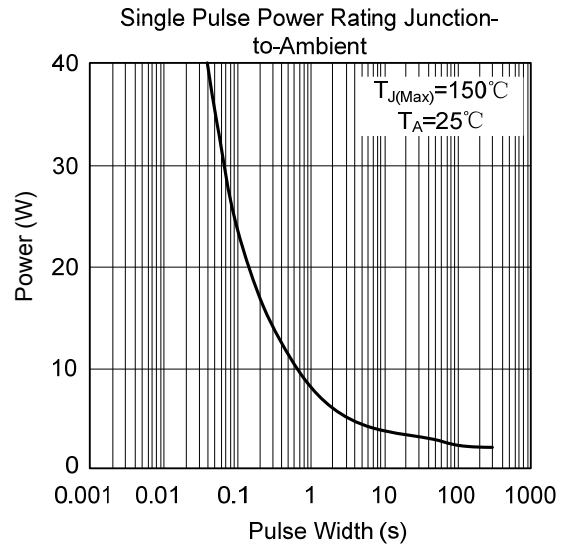
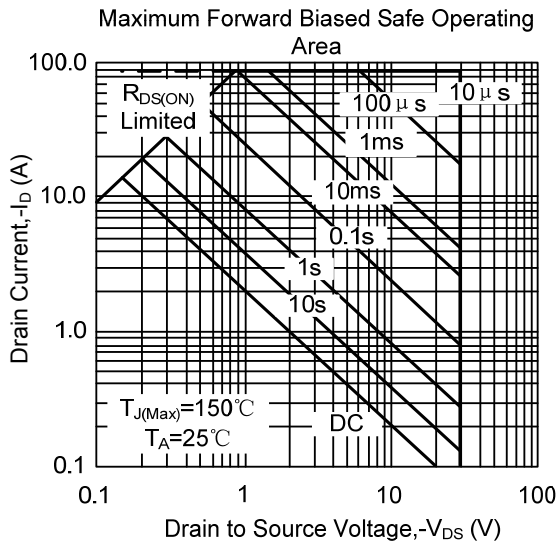
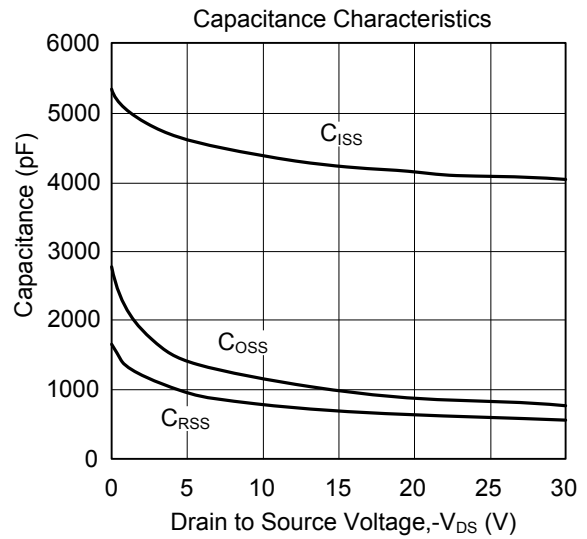
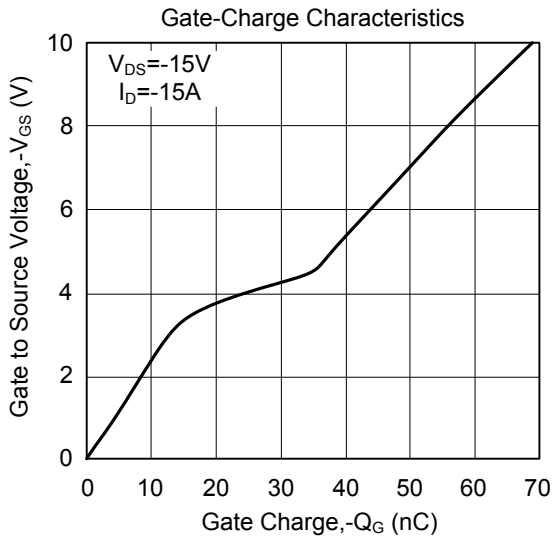
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0\text{ V}, I_D = -250\ \mu\text{A}$	-30			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS} = -24\text{ V}, V_{GS} = 0\text{ V}$			-1	μA
Drain-Source Breakdown Voltage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 25\text{ V}$			± 100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS} = V_{GS}, I_D = -250\ \mu\text{A}$	-1.5	-2.2	-3.5	V
On State Drain Current	$I_{D(ON)}$	$V_{DS} = -5\text{ V}, V_{GS} = -10\text{ V}$	-60			A
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS} = -20\text{ V}, I_D = -15\text{ A}$		5.5	7	$\text{m}\Omega$
		$V_{GS} = -10\text{ V}, I_D = -15\text{ A}$		6.6	8.5	$\text{m}\Omega$
		$V_{GS} = -6\text{ V}, I_D = -10\text{ A}$		8.2		$\text{m}\Omega$
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	$V_{DS} = -15\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$		4245	5500	pF
Output Capacitance	C_{OSS}			983		
Reverse Transfer Capacitance	C_{RSS}			689		
SWITCHING PARAMETERS						
Total Gate Charge	Q_G	$V_{DS} = -15\text{ V}, V_{GS} = -10\text{ V}, I_D = -15\text{ A}$		69	90	nC
Gate Source Charge	Q_{GS}			15.2		
Gate Drain Charge	Q_{GD}			18.8		
Turn-ON Delay Time	$t_{D(ON)}$	$V_{GS} = -10\text{ V}, V_{DS} = -15\text{ V}, R_L = 1.0\ \Omega, R_{GEN} = 3\ \Omega$		16.5		ns
Turn-ON Rise Time	t_R			23.5		
Turn-OFF Delay Time	$t_{D(OFF)}$			116		
Turn-OFF Fall-Time	t_F			82		
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage(Note2)	V_{SD}	$I_S = -1\text{ A}, V_{GS} = 0\text{ V}$		-0.72	-1	V
Maximum Continuous Drain-Source Diode Forward Current	I_S				5	A
Reverse Recovery Time	t_{RR}	$I_F = -15\text{ A}, dI/dt = 100\text{ A}/\mu\text{s}$		59	77	ns
Reverse Recovery Charge	Q_{RR}	$I_F = -15\text{ A}, dI/dt = 100\text{ A}/\mu\text{s}$		55		nC

- Note: 1. Pulse width limited by $T_{J(MAX)}$
 2. Pulse width $\leq 300\ \mu\text{s}$, duty cycle $\leq 0.5\%$ max.
 3. Surface mounted on 1 in² copper pad of FR4 board

TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS(Cont.)



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