



UT4413

Power MOSFET

P-CHANNEL ENHANCEMENT MODE

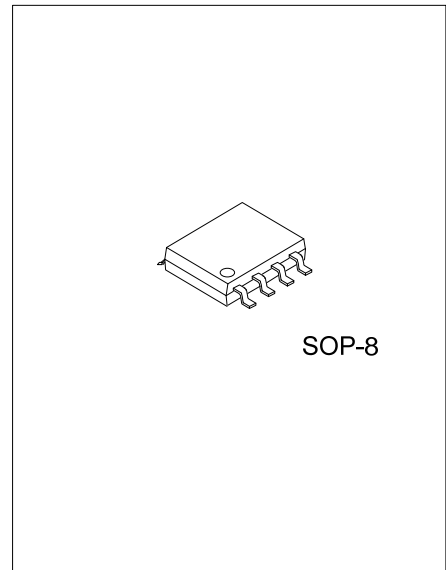
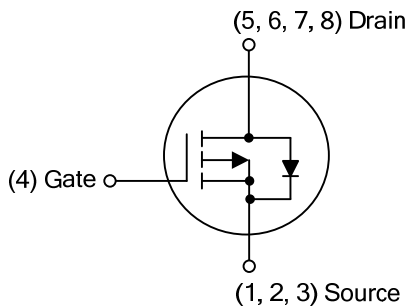
DESCRIPTION

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

- * $R_{DS(ON)} \leq 14 \text{ m}\Omega @ V_{GS}=-10\text{V}, I_D=-15\text{A}$
- $R_{DS(ON)} \leq 13 \text{ m}\Omega @ V_{GS}=-20\text{V}, I_D=-15\text{A}$
- * Low capacitance
- * Low gate charge
- * Fast switching capability
- * Avalanche energy specified

SYMBOL



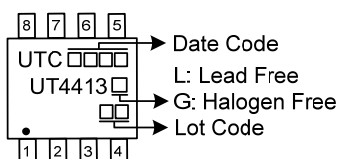
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UT4413L-S08-R	UT4413G-S08-R	SOP-8	S	S	S	G	D	D	D	D	Tape Reel

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

<p>UT4413G-S08-R</p> <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Green Package</p>	<p>(1) R: Tape Reel</p> <p>(2) S08: SOP-8</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
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MARKING



■ 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
Avalanche Energy	Single Pulsed (Note 3) E_{AS}	198	mJ
Peak Diode Recovery dv/dt (Note 4)	dv/dt	1.3	V/ns
Power Dissipation ($T_C=25^\circ\text{C}$)	P_D	5	W
Junction a Temperature	T_J	-55 ~ +150	$^\circ\text{C}$
Strong Temperature	T_{STG}	-55 ~ +150	$^\circ\text{C}$

Notes: 1. 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.

2. Repetitive Rating: Pulse width limited by maximum junction temperature.

3. $L = -10\text{mH}$, $I_{AS} = -6.3\text{A}$, $V_{DD} = -20\text{V}$, $R_G = 25\Omega$, Starting $T_J = 25^\circ\text{C}$

4. $I_{SD} \leq -2.0\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, Starting $T_J = 25^\circ\text{C}$

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	75	$^\circ\text{C}/\text{W}$
Junction to Case	θ_{JC}	25	$^\circ\text{C}/\text{W}$

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

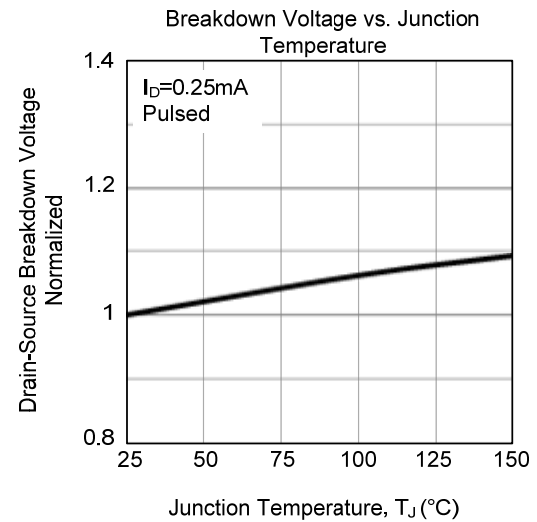
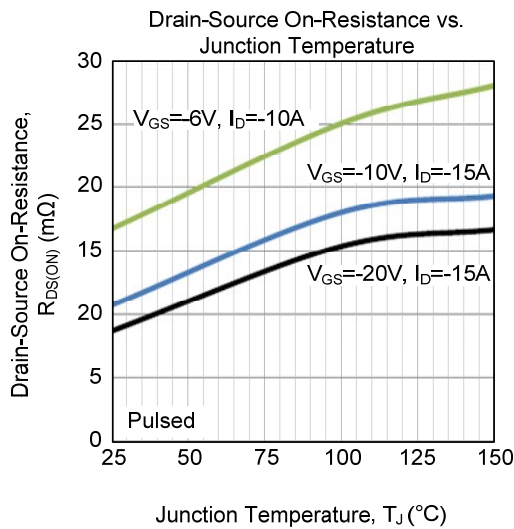
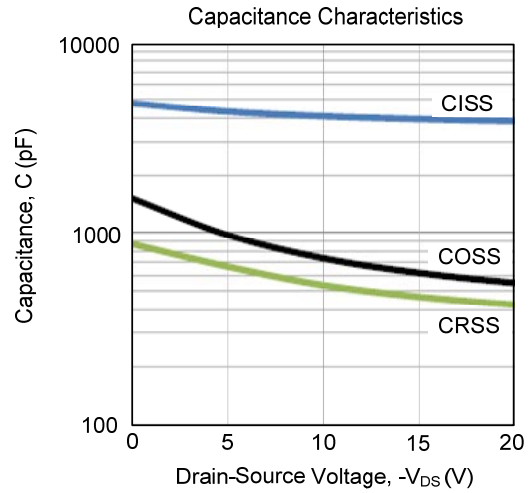
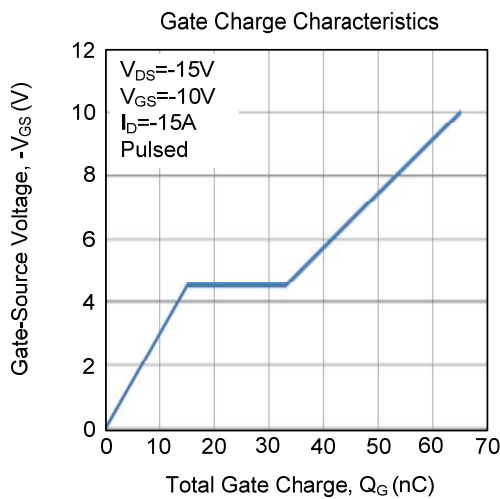
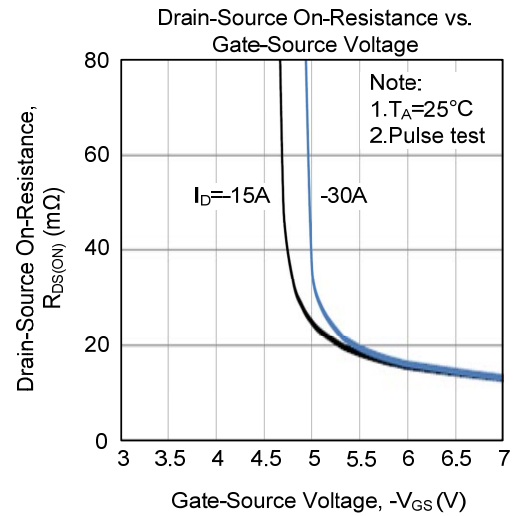
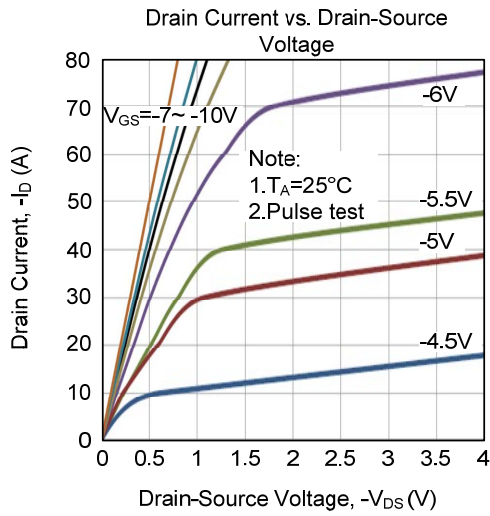
■ ELECTRICAL CHARACTERISTICS (T_J =25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =-250μA	-30			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =-24V, V _{GS} =0V			-1	μA
Drain-Source Breakdown Voltage	I _{GSS}	V _{DS} =0V, V _{GS} =±25V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =-250μA	-2.0	-3.0	-4.0	V
On State Drain Current	I _{D(ON)}	V _{DS} =-5V, V _{GS} =-10V	-60			A
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =-10V, I _D =-15A		10	14	mΩ
		V _{GS} =-20V, I _D =-15A		8.0	13	mΩ
DYNAMIC PARAMETERS						
Input Capacitance	C _{ISS}	V _{DS} =-15V, V _{GS} =0V, f=1MHz		3927	5500	pF
Output Capacitance	C _{OSS}			618		
Reverse Transfer Capacitance	C _{RSS}			481		
SWITCHING PARAMETERS						
Total Gate Charge	Q _G	V _{DS} =-15V, V _{GS} =-10V, I _D =-15A		65	90	nC
Gate Source Charge	Q _{GS}			15		
Gate Drain Charge	Q _{GD}			18		
Turn-ON Delay Time	t _{D(ON)}	V _{GS} =-10V, V _{DS} =-15V, R _L =1.0Ω, R _{GEN} =3Ω		21		ns
Turn-ON Rise Time	t _R			17		
Turn-OFF Delay Time	t _{D(OFF)}			53		
Turn-OFF Fall-Time	t _F			26		
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Continuous Drain-Source Diode Forward Current	I _S				-15	A
Maximum Body-Diode Pulsed Current (Note 1)	I _{SM}				-80	A
Drain-Source Diode Forward Voltage(Note2)	V _{SD}	I _S =-1A, V _{GS} =0V		-0.72	-1	V
Reverse Recovery Time	t _{rr}	I _F =-15A, dI/dt=100A/μs		205		ns
Reverse Recovery Charge	Q _{rr}	I _F =-15A, dI/dt=100A/μs		843		nC

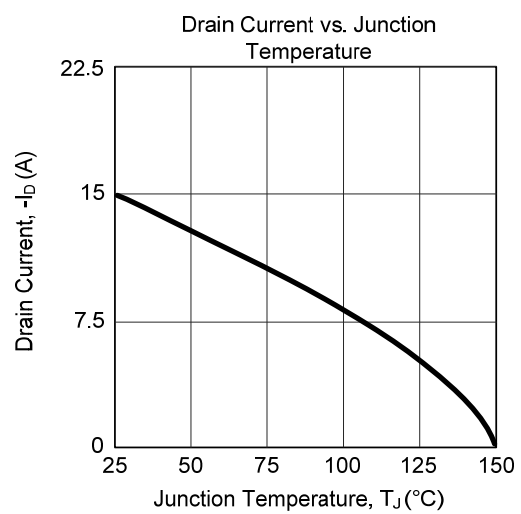
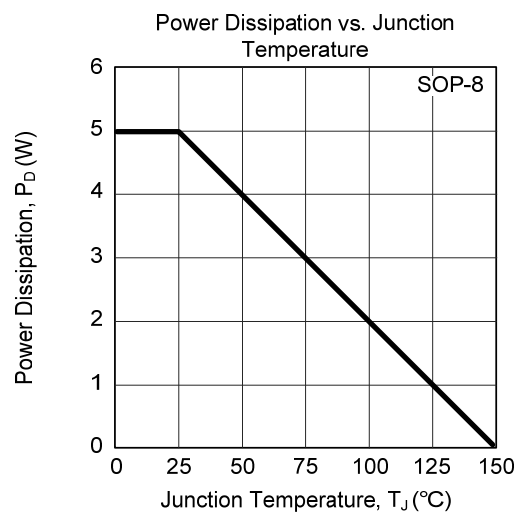
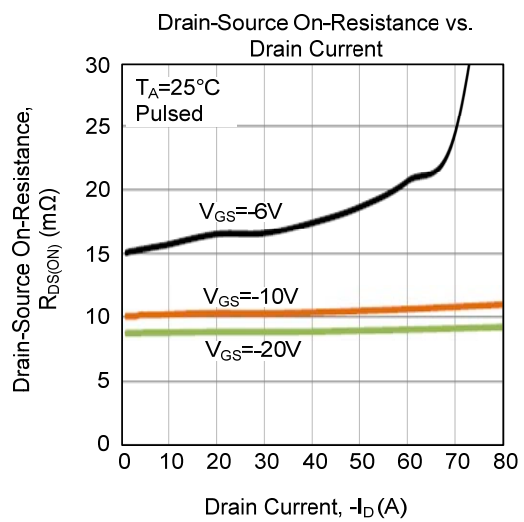
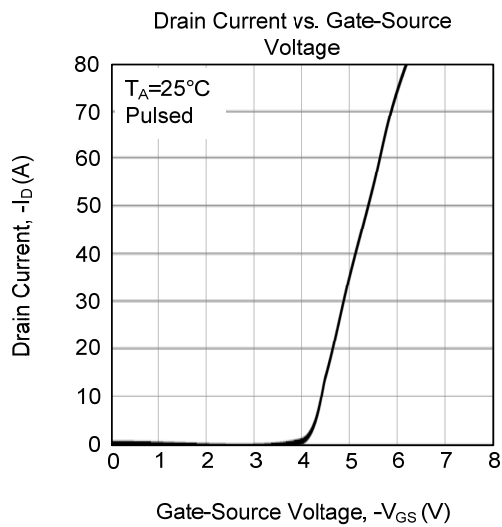
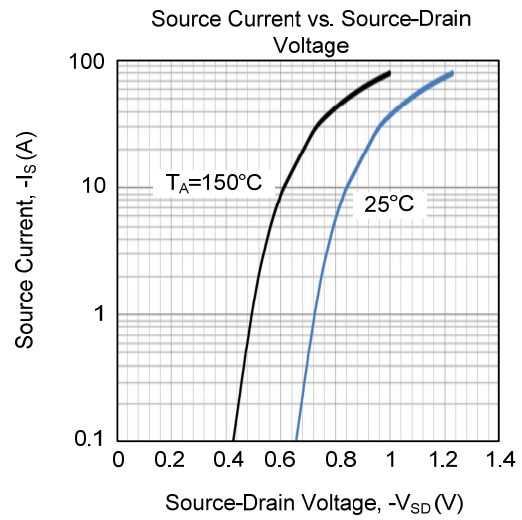
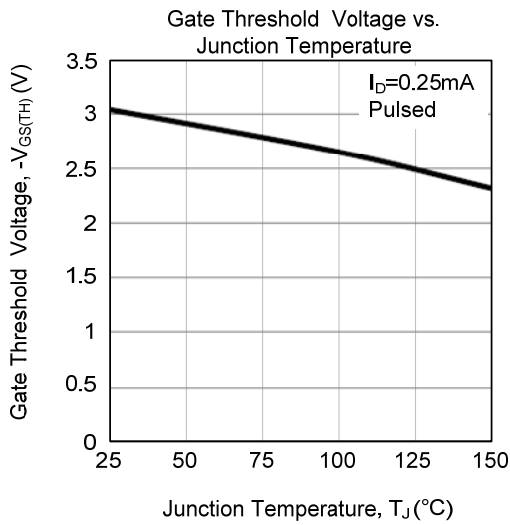
Notes: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%.

2. Essentially independent of operating temperature.

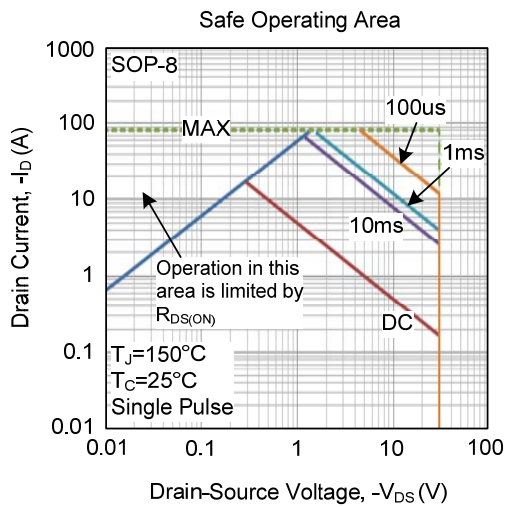
■ TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



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