



UT3413

Power MOSFET

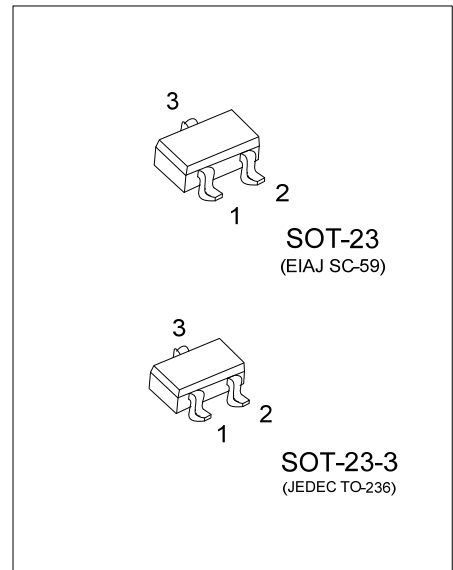
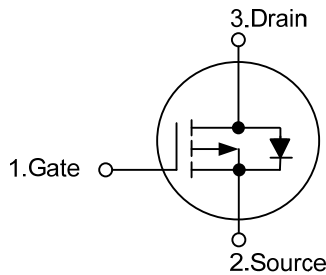
P-CHANNEL ENHANCEMENT MODE

■ DESCRIPTION

The UTC **UT3413** is P-channel enhancement mode Power MOSFET, designed with high density cell, with fast switching speed, low on-resistance, excellent thermal and electrical capabilities and operation with low gate voltages.

This device is suitable for use as a load switch or in PWM applications.

■ SYMBOL



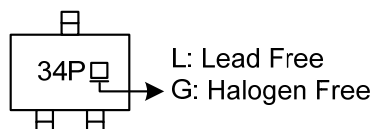
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UT3413L-AE2-R	UT3413G-AE2-R	SOT-23-3	G	S	D	Tape Reel
UT3413L-AE3-R	UT3413G-AE3-R	SOT-23	G	S	D	Tape Reel

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

<p>UT3413G-AE3-R</p> <p>(1) Packing Type (2) Package Type (3) Green Package</p>	<p>(1) R: Tape Reel (2) AE2: SOT-23-3, AE3: SOT-23, AL3: SOT-323 (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	RATING	UNIT
Drain-Source Voltage	V_{DSS}	-20	V
Gate-Source Voltage	V_{GSS}	± 8	V
Continuous Drain Current (Note 3)	I_D	-3	A
Pulsed Drain Current (Note 1, 2)	I_{DM}	-15	A
Power Dissipation	P_D	1.4	W
Junction Temperature	T_J	+150	$^{\circ}\text{C}$
Storage 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 CHARACTERISTICS

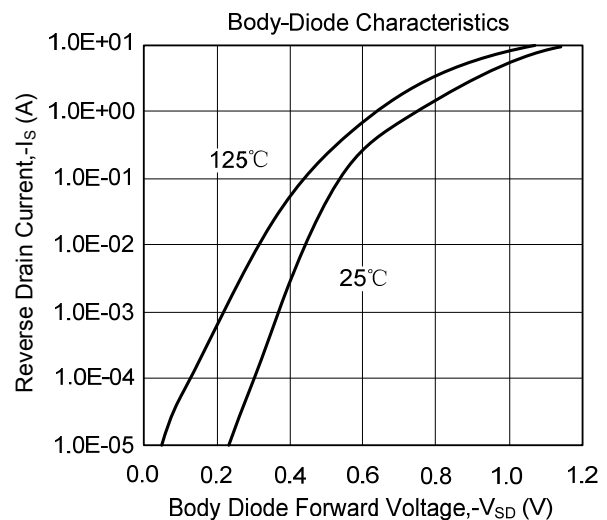
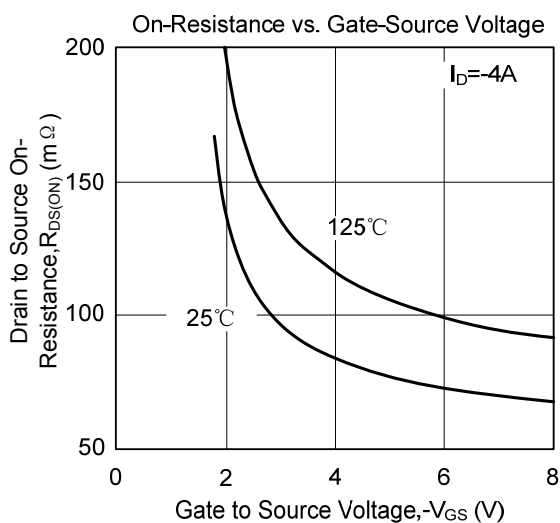
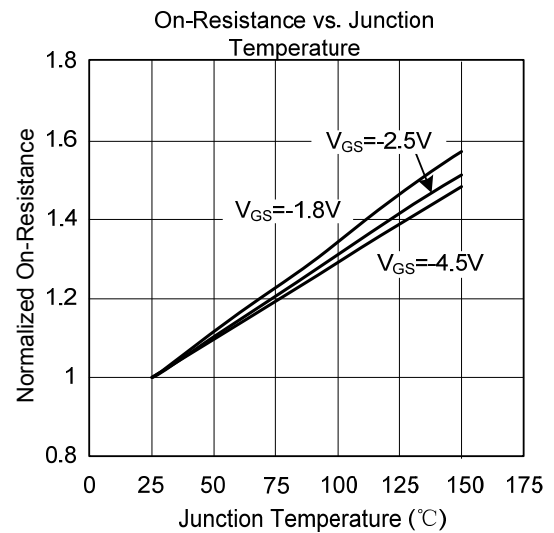
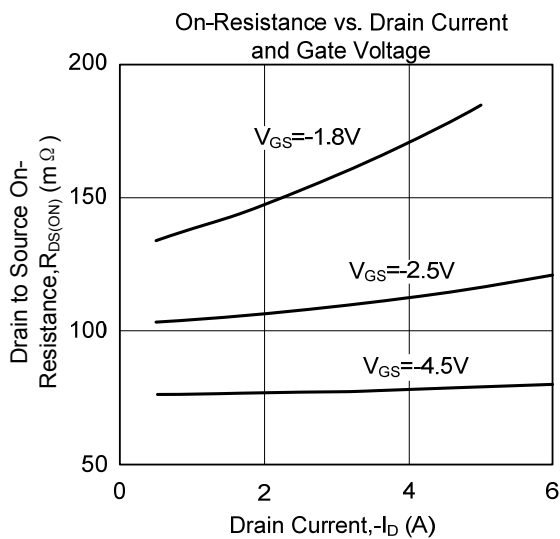
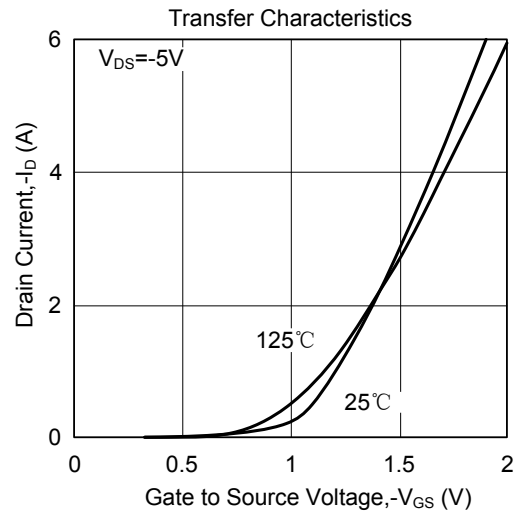
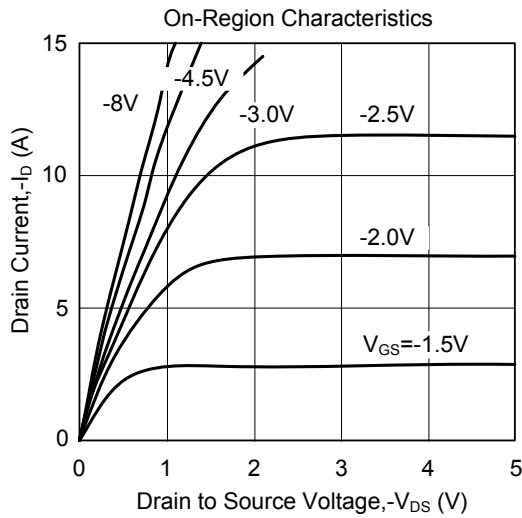
PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Junction to Ambient (Note 3)	θ_{JA}		70	90	$^{\circ}\text{C/W}$

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

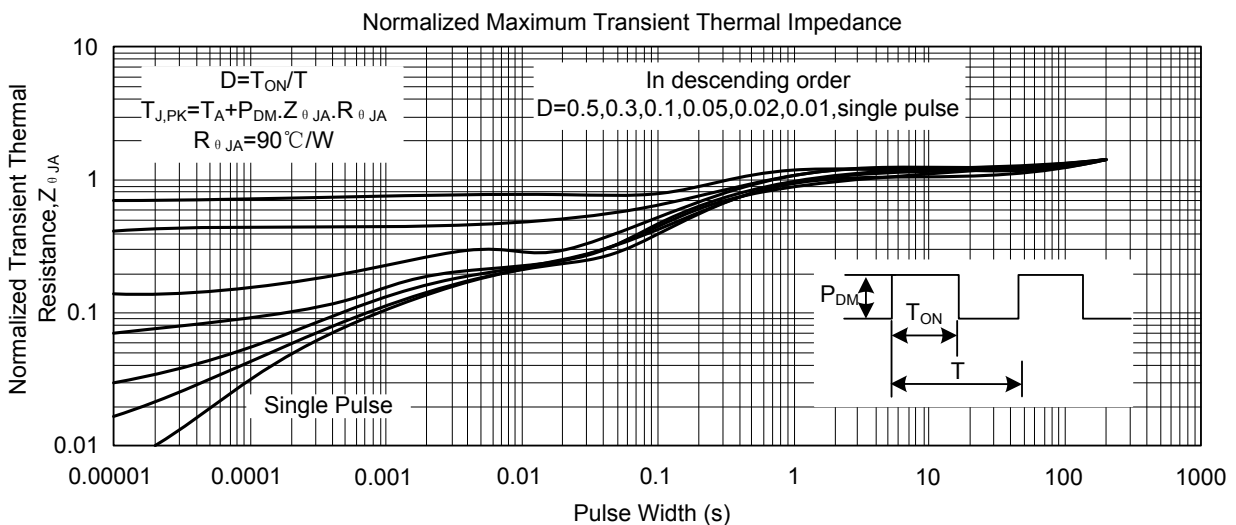
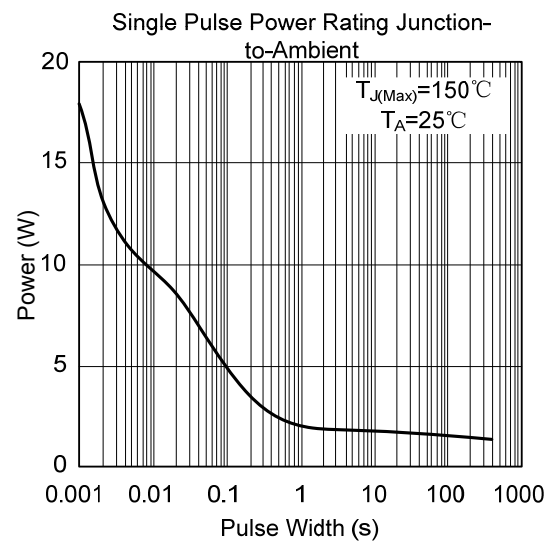
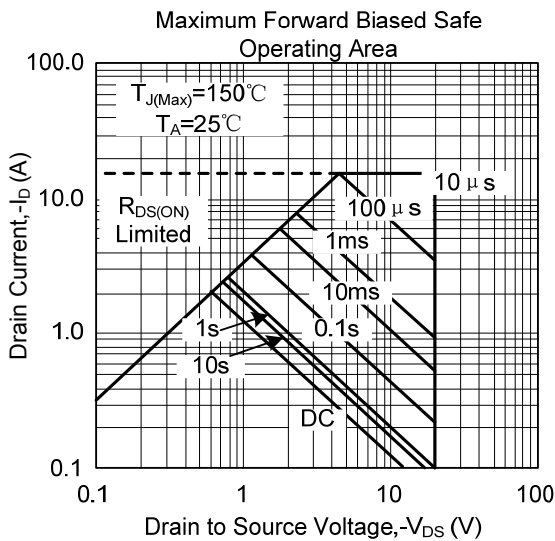
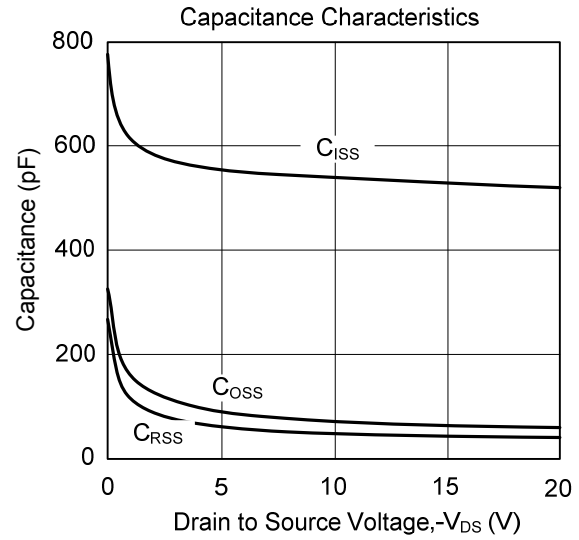
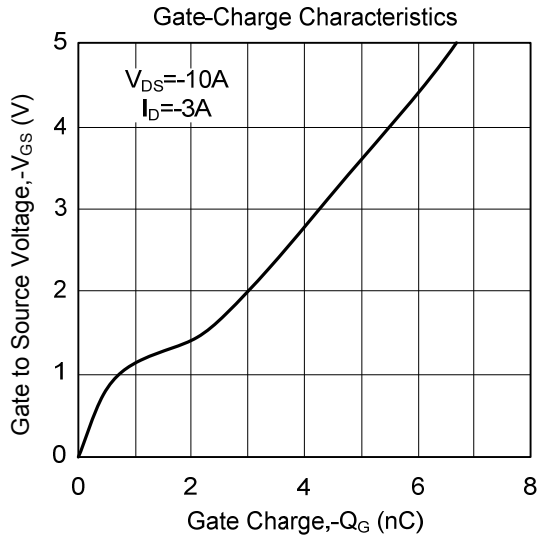
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0\text{V}, I_D=-250\mu\text{A}$	-20			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=-16\text{V}, V_{GS}=0\text{V}$			-1	μA
Gate-Source Leakage Current	I_{GSS}	$V_{DS}=0\text{V}, V_{GS}=\pm 8\text{V}$			± 100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=-250\mu\text{A}$	-0.3	-0.55	-1	V
Drain-Source On-State Resistance(Note 2)	$R_{DS(ON)}$	$V_{GS}=-4.5\text{V}, I_D=-3\text{A}$		81	97	m Ω
		$V_{GS}=-2.5\text{V}, I_D=-2.6\text{A}$		108	130	m Ω
		$V_{GS}=-1.8\text{V}, I_D=-1\text{A}$		146	190	m Ω
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	$V_{DS}=-10\text{V}, V_{GS}=0\text{V}, f=1\text{MHz}$		540		pF
Output Capacitance	C_{OSS}			72		pF
Reverse Transfer Capacitance	C_{RSS}			49		pF
SWITCHING PARAMETERS						
Total Gate Charge (Note 2)	Q_G	$V_{DS}=-10\text{V}, V_{GS}=-4.5\text{V}, I_D=-3\text{A}$		6.1		nC
Gate-Source Charge	Q_{GS}			0.6		nC
Gate-Drain Charge	Q_{GD}			1.6		nC
Turn-ON Delay Time (Note 2)	$t_{D(ON)}$	$V_{GS}=-4.5\text{V}, V_{DS}=-10\text{V}, R_L=3.3\Omega, R_{GEN}=3\Omega$		10		ns
Turn-ON Rise Time	t_R			12		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			44		ns
Turn-OFF Fall Time	t_F			22		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Continuous Drain-Source Diode Forward Current	I_S				-2	A
Drain-Source Diode Forward Voltage(Note2)	V_{SD}	$I_S=-1\text{A}, V_{GS}=0\text{V}$		-0.78	-1	V
Reverse Recovery Time	t_{rr}	$I_F=-3\text{A}, di/dt=100\text{A}/\mu\text{s}$		21		ns
Reverse Recovery Charge	Q_{rr}				7.5	

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

■ TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS(Cont.)



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