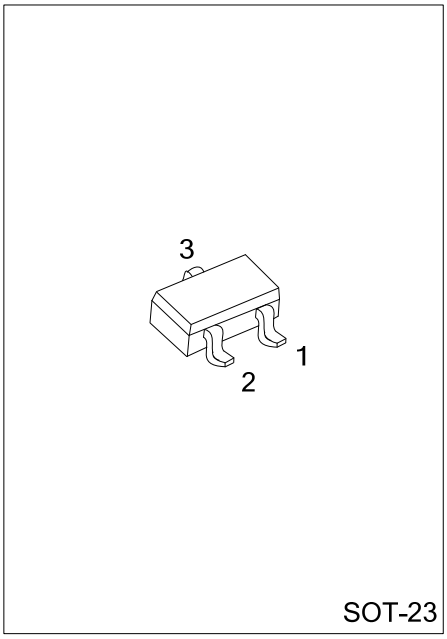
UT3413

Power MOSFET

P-CHANNEL ENHANCEMENT MODE

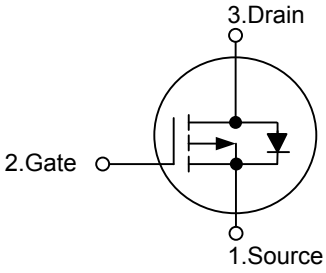


■ DESCRIPTION

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

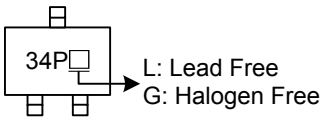


■ ORDERING INFORMATION

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

UT3413L-AE3-R (1)Packing Type (2)Package Type (3)Lead Plating	(1) R: Tape Reel (2) AE3: SOT-23 (3) G: Halogen Free, L: Lead Free

■ MARKING



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

PARAMETER	SYMBOL	RATING	UNITS
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
Total Power Dissipation	P_D	1.4	W
Junction Temperature	T_J	+150	°C
Storage Temperature	T_{STG}	-55 ~ +150	°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}		70	90	°C/W

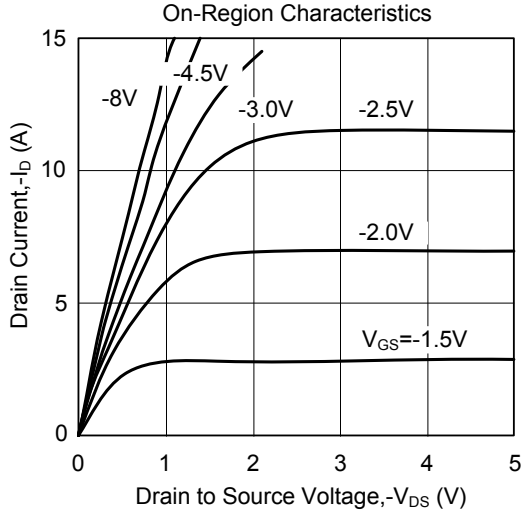
■ ELECTRICAL CHARACTERISTICS (T_J =25°C, unless otherwise specified)

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

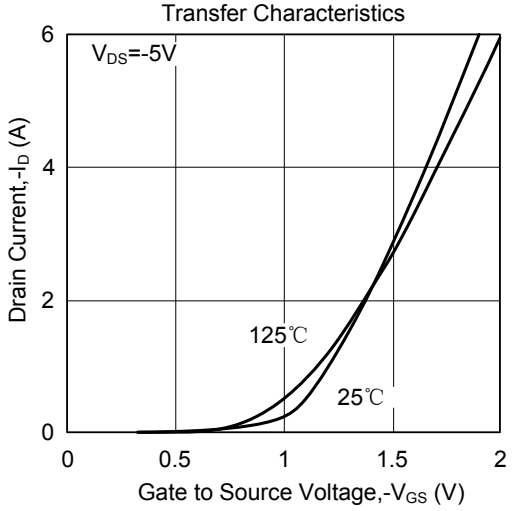
Note: 1. Pulse width limited by $T_{J(MAX)}$
2. Pulse width ≤300μs, duty cycle ≤2%.
3. Surface mounted on 1 in^2 copper pad of FR4 board

■ TYPICAL CHARACTERISTICS

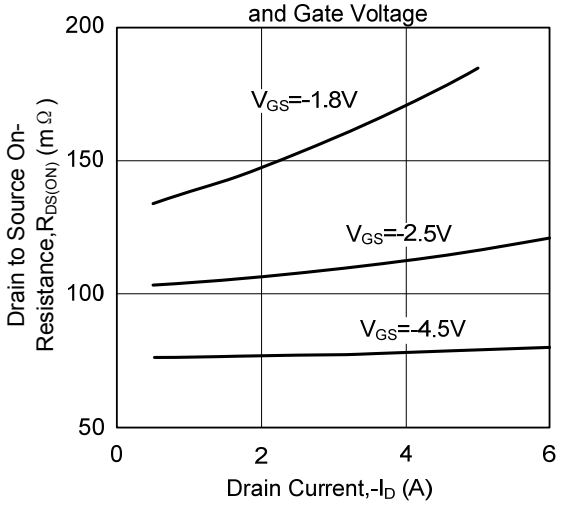
On-Region Characteristics



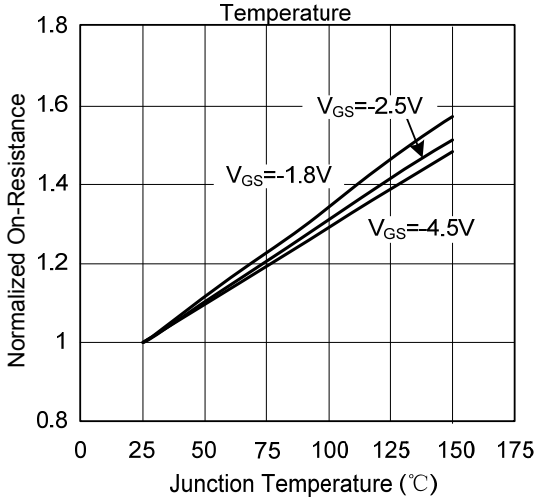
Transfer Characteristics



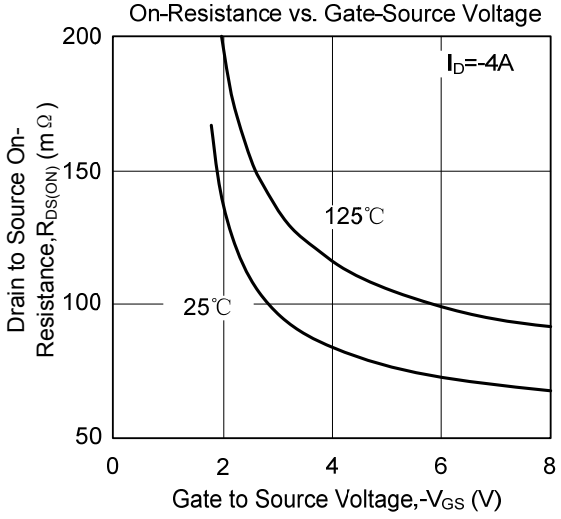
On-Resistance vs. Drain Current and Gate Voltage



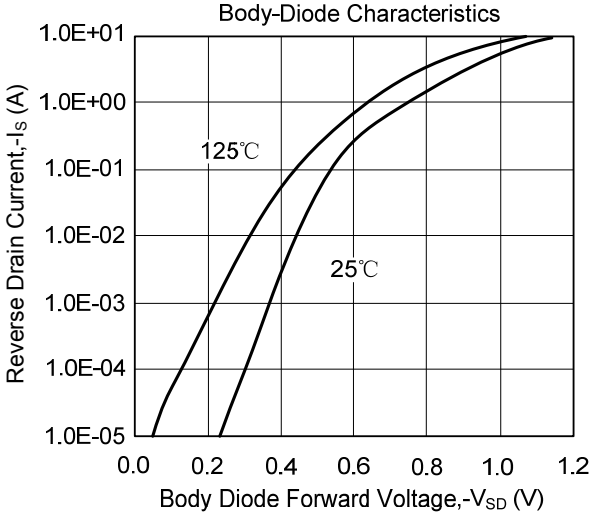
On-Resistance vs. Junction Temperature



On-Resistance vs. Gate-Source Voltage

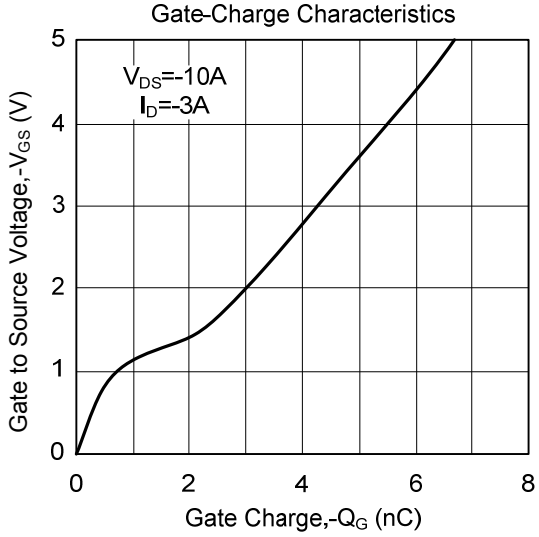


Body-Diode Characteristics

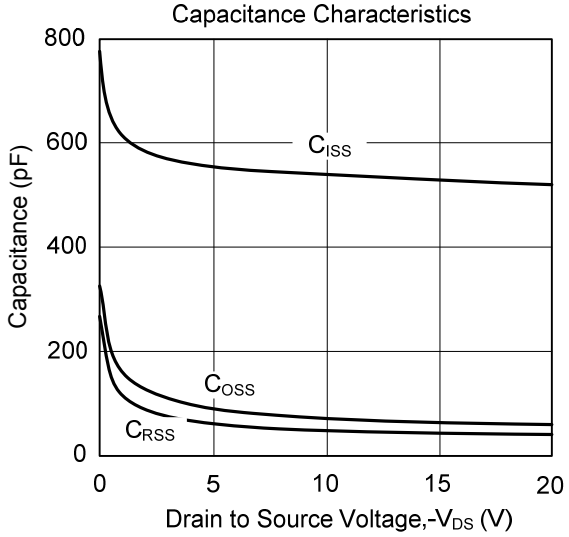


■ TYPICAL CHARACTERISTICS(Cont.)

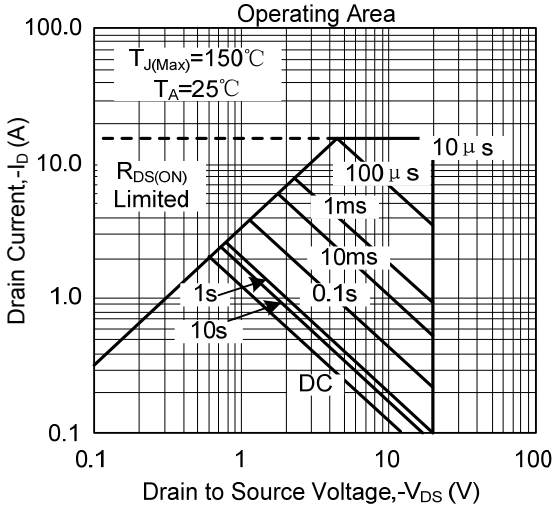
Gate-Charge Characteristics



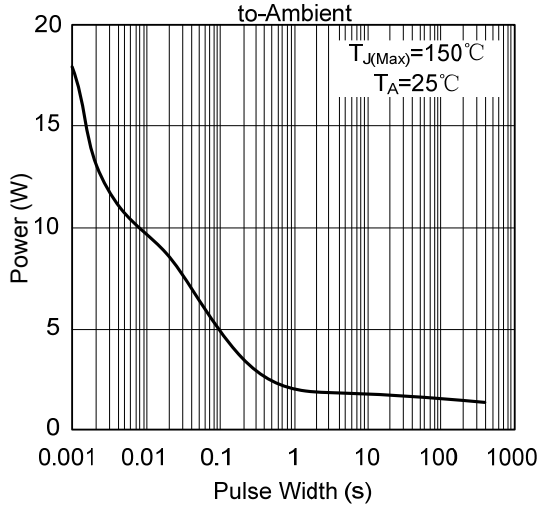
Capacitance Characteristics



Maximum Forward Biased Safe Operating Area



Single Pulse Power Rating Junction-to-Ambient



Normalized Maximum Transient Thermal Impedance