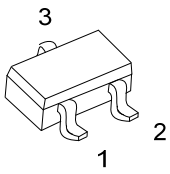
UT3416-H

Power MOSFET

6.7A, 20V N-CHANNEL MOSFET



SOT-23-3
(JEDEC TO-236)

■ DESCRIPTION

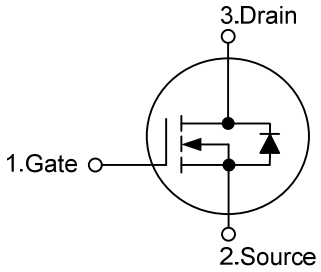
The UTC **UT3416-H** is an N-Channel MOSFET, it uses UTC's advanced technology to provide customers with a minimum on-state resistance and high switching speed, etc.

The UTC **UT3416-H** is suitable for high efficiency fast switching applications.

■ FEATURES

* $R_{DS(ON)} \leq 19m\Omega$ @ V_{GS}=4.5V, I_D=4.0A
* High switching speed
* Improved dv/dt capability

■ SYMBOL



■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UT3416L-AE2-R	UT3416G-AE2-R	SOT-23-3	G	S	D	Tape Reel

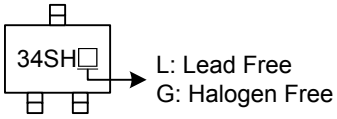
Note: Pin Assignment: G: Gate S: Source D: Drain

UT3414G-AE2-R

(1)Packing Type
(2)Package Type
(3)Green Package

(1) R: Tape Reel
(2) AE2: SOT-23-3
(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



■ ABSOLUTE MAXIMUM RATINGS (T_C=25°C, unless otherwise noted)

PARAMETER			SYMBOL	RATINGS	UNIT
Drain-Source Voltage			V_{DSS}	20	V
Gate-Source Voltage			V_{GSS}	±10	V
Drain Current	Continuous	T_C=25°C	I_D	6.7	A
		T_C=100°C		4.2	A
	Pulsed (Note 1)		I_{DM}	26.8	A
Power Dissipation	T_C=25°C		P_D	1.56	W
	Derate above 25°C			0.012	W/°C
Junction Temperature			T_J	-55~+150	°C
Storage Temperature Range			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 CHARACTERISTICS

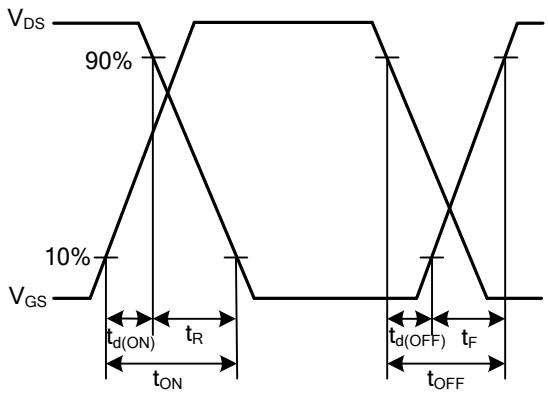
PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	80	°C/W

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

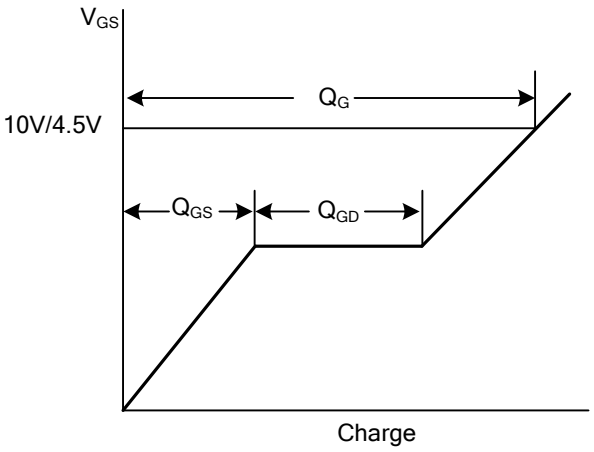
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	I_D=250μA, V_{GS}=0V	20			V
BV_{DSS} Temperature Coefficient		$\triangle BV_{DSS}/\triangle T_J$	Reference to 25°C, I_D=1mA		0.02		V/°C
Drain-Source Leakage Current		I_{DSS}	V_{DS}=20V, V_{GS}=0V, T_J=25°C			1	μA
			V_{DS}=16V, V_{GS}=0V, T_J=125°C			10	μA
Gate-Source Leakage Current	Forward	I_{GSS}	V_{GS}=+10V, V_{DS}=0V			+100	nA
	Reverse		V_{GS}=-10V, V_{DS}=0V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250μA	0.3	0.6	0.8	V
$V_{GS(TH)}$ Temperature Coefficient		$\triangle V_{GS(TH)}$			2		mV/°C
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	V_{GS}=4.5V, I_D=4A		15	19	mΩ
			V_{GS}=2.5V, I_D=3A		18	24	mΩ
			V_{GS}=1.8V, I_D=2A		23	32	mΩ
Forward Transconductance		g_{FS}	V_{DS}=10V, I_D=4A		9.5		S
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	V_{GS}=0V, V_{DS}=10V, f=1.0MHz		600	870	pF
Output Capacitance		C_{OSS}			70	100	pF
Reverse Transfer Capacitance		C_{RSS}			45	65	pF
SWITCHING PARAMETERS							
Total Gate Charge (Note 2, 3)		Q_G	V_{GS}=4.5V, V_{DS}=10V, I_D=4A		5.8	8	nC
Gate to Source Charge (Note 2, 3)		Q_{GS}			0.6	1	nC
Gate to Drain Charge (Note 2, 3)		Q_{GD}			2	4	nC
Turn-ON Delay Time (Note 2, 3)		$t_{D(ON)}$	V_{DD}=10V, V_{GS}=4.5V, I_D=1A, R_G=25Ω		5.0	9	ns
Rise Time (Note 2, 3)		t_R			14.4	27	ns
Turn-OFF Delay Time (Note 2, 3)		$t_{D(OFF)}$			30.0	55	ns
Fall-Time (Note 2, 3)		t_F			9.2	17	ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Continuous Source Current		I_S	V_G=V_D=0V , Force Current			6.7	A
Pulsed Source Current		I_{SM}				26.8	A
Drain-Source Diode Forward Voltage		V_{SD}	I_S=1A, V_{GS}=0V, T_J=25°C			1	V

Notes: 1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed, pulse width≤300μs, duty cycle≤2%.
3. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS



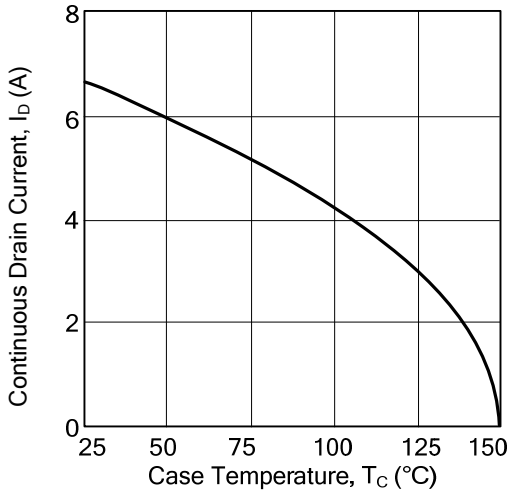
Switching Time Waveform



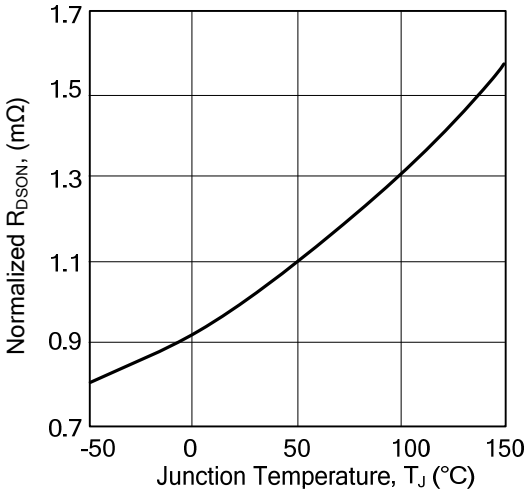
Gate Charge Waveforms

■ TYPICAL CHARACTERISTICS

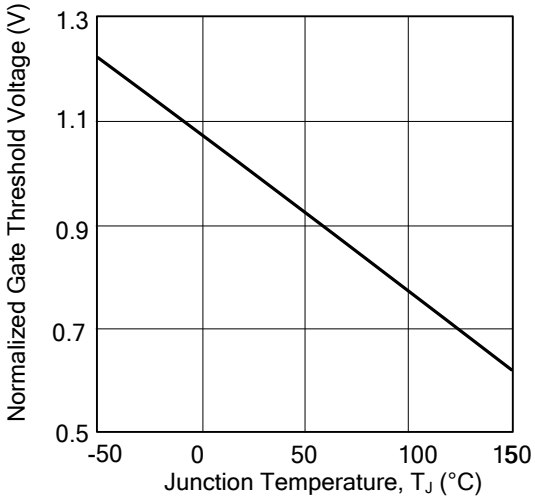
Continuous Drain Current vs. T_C



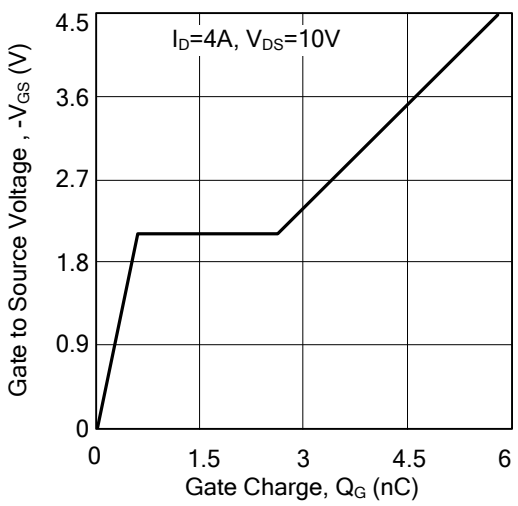
Normalized R_{DSON} vs. T_J



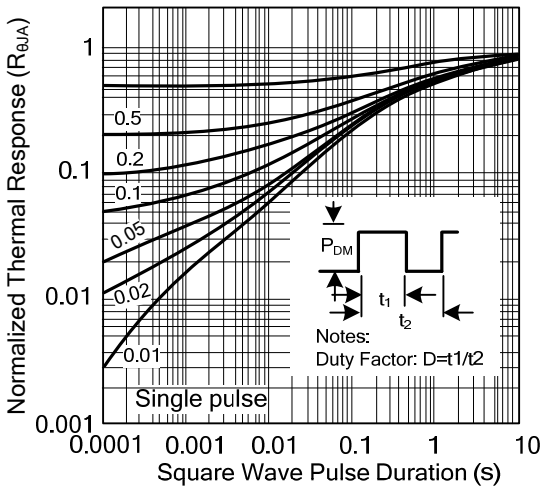
Normalized V_{TH} vs. T_J



Gate Charge Waveform



Normalized Transient Impedance



Maximum Safe Operation Area