



UT3416

Power MOSFET

6.5A, 20V N-CHANNEL ENHANCEMENT MODE FIELD EFFECT TRANSISTOR

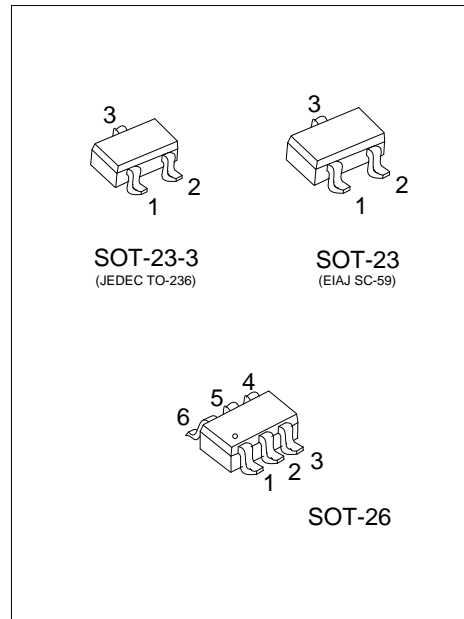
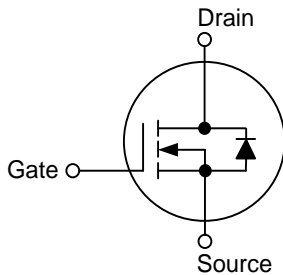
DESCRIPTION

The UTC **UT3416** is advanced N-channel enhancement MOSFET which can provide the designer with the best combination of excellent $R_{DS(ON)}$, low gate charge and low gate voltages as low as 1.8V. When it is used as a load switch or in PWM application, the UTC **UT3416** can be considered as an ideal.

FEATURES

- * $R_{DS(ON)} \leq 22\ m\Omega$ @ $V_{GS}=4.5V, I_D=6.5A$
- $R_{DS(ON)} \leq 26\ m\Omega$ @ $V_{GS}=2.5V, I_D=5.5A$
- $R_{DS(ON)} \leq 40\ m\Omega$ @ $V_{GS}=1.8V, I_D=5.0A$

SYMBOL



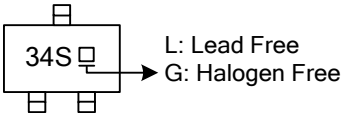
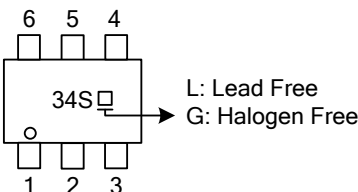
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment						Packing
Lead Free	Halogen Free		1	2	3	4	5	6	
UT3416L-AE2-R	UT3416G-AE2-R	SOT-23-3	G	S	D	-	-	-	Tape Reel
UT3416L-AE3-R	UT3416G-AE3-R	SOT-23	G	S	D	-	-	-	Tape Reel
UT3416L-AG6-R	UT3416G-AG6-R	SOT-26	D	D	G	S	D	D	Tape Reel

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

UT3416G-AE2-R	(1)Packing Type	(1) R: Tape Reel
	(2)Package Type	(2) AE2: SOT-23-3, AE3: SOT-23, AG6: SOT-26
	(3)Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING

SOT-23-3 / SOT-23	SOT-26
 <p>34S □ → L: Lead Free G: Halogen Free</p>	 <p>6 5 4 34S □ → L: Lead Free G: Halogen Free 1 2 3</p>

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

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	V _{DSS}	20	V
Gate-Source Voltage	V _{GSS}	±8	V
Continuous Drain Current	I _D	6.5	A
Pulsed Drain Current (Note 2)	I _{DM}	30	A
Power Dissipation (Note 3)	SOT-23-3	1.4	W
	SOT-26	1.6	W
Junction Temperature	T _J	+150	°C
Storage Temperature	T _{STG}	-55 ~ +150	°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. Surface mounted on 1in² copper pad of FR4 board.

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	SOT-23	100	°C/W
	SOT-23-3		
	SOT-26	90	°C/W

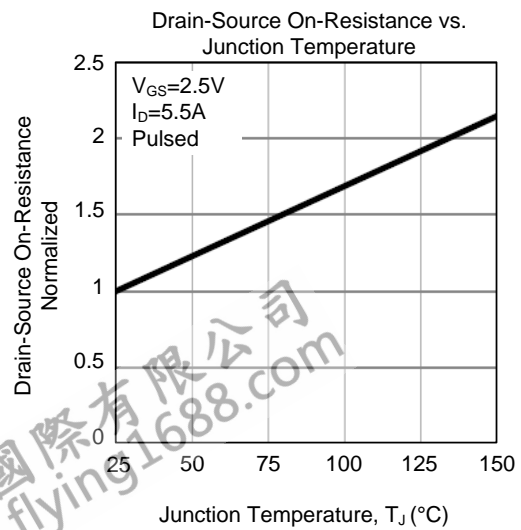
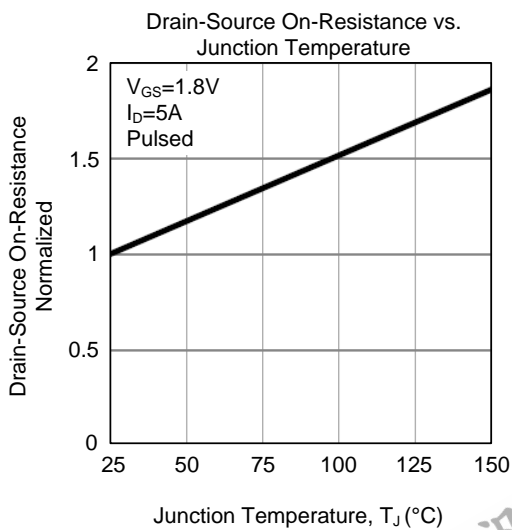
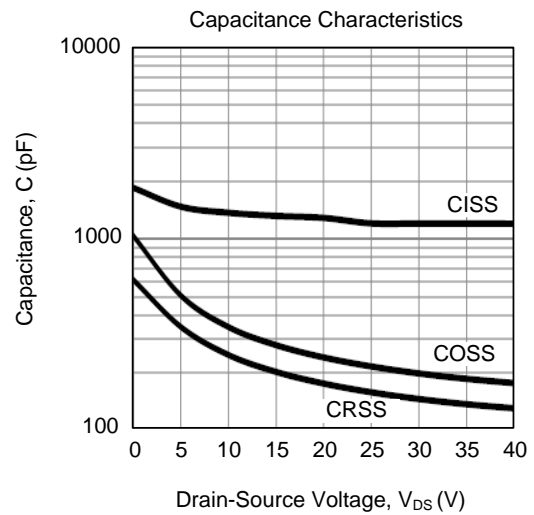
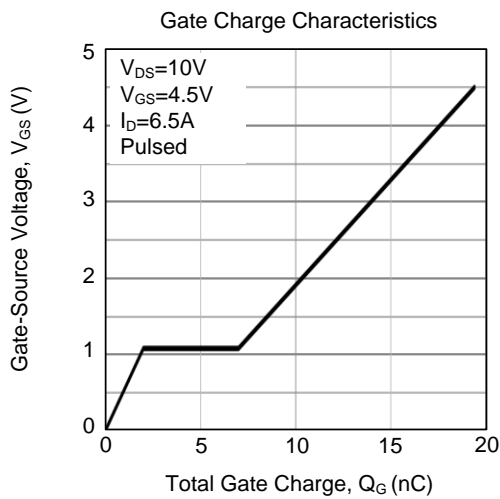
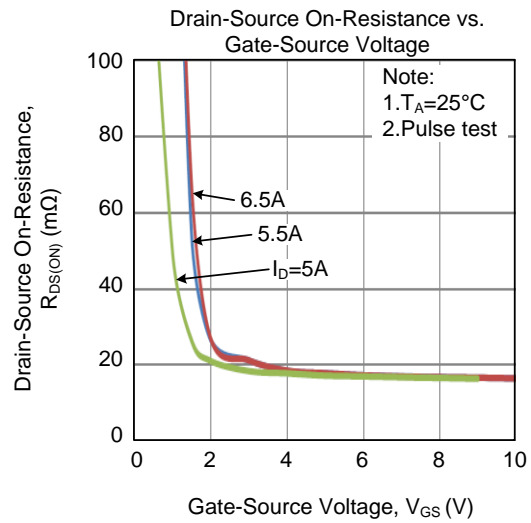
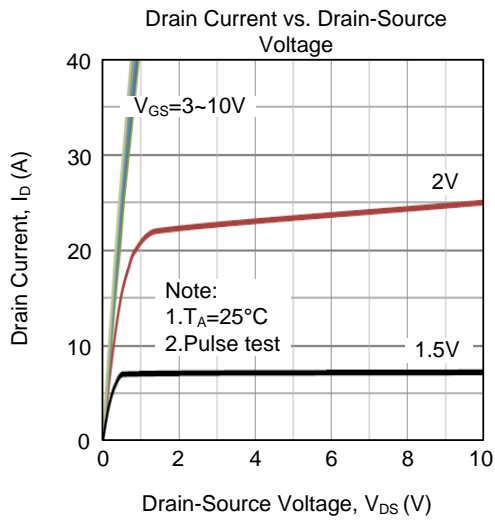
Note: Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

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

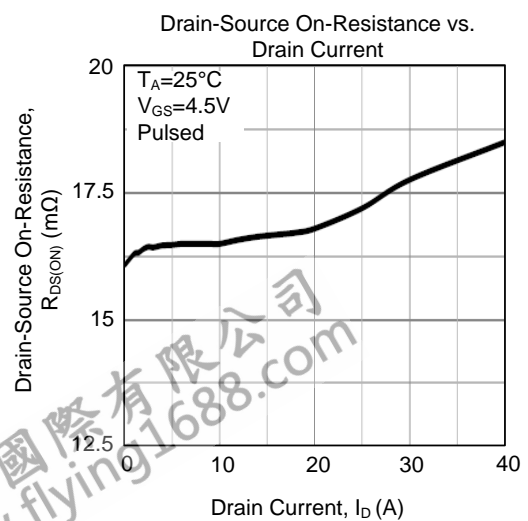
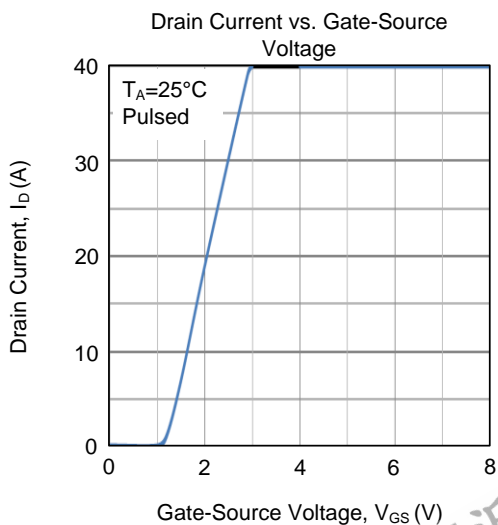
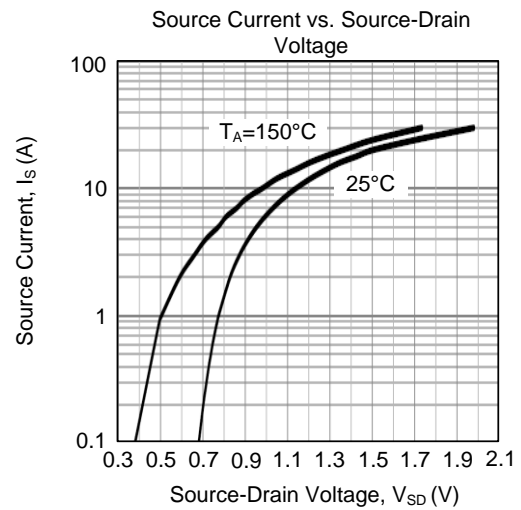
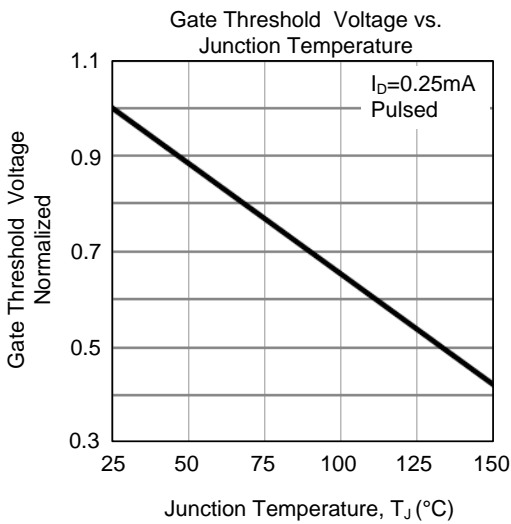
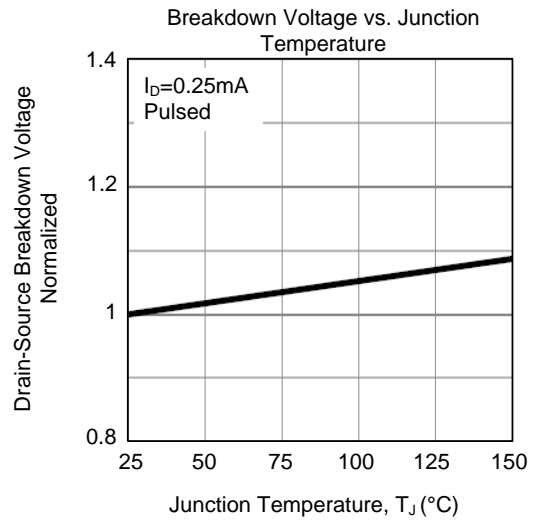
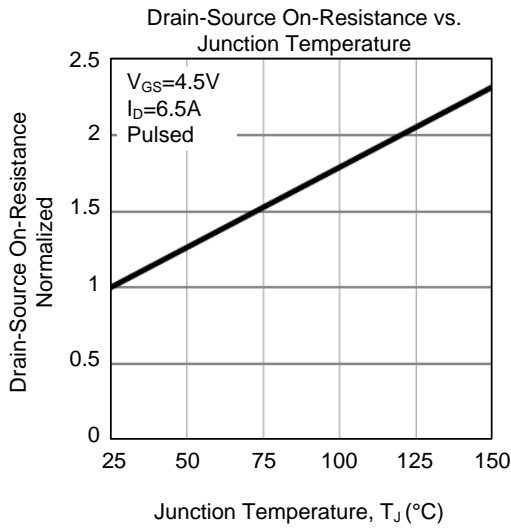
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_D = 250\mu A$	20			V
Drain-Source Leakage Current	I_{DSS}	$V_{GS} = 0V, V_{DS} = 16V$			1	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS} = \pm 4.5V, V_{DS} = 0V$			± 1	μA
		$V_{GS} = \pm 8V, V_{DS} = 0V$			± 10	μA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	0.4	0.6	1	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS} = 4.5V, I_D = 6.5A$		18	22	m Ω
		$V_{GS} = 2.5V, I_D = 5.5A$		21	26	m Ω
		$V_{GS} = 1.8V, I_D = 5.0A$		34	40	m Ω
On State Drain Current	$I_{D(ON)}$	$V_{GS} = 4.5V, V_{DS} = 5.0V$	30			A
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	$V_{GS} = 0V, V_{DS} = 10V, f = 1MHz$		1160		pF
Output Capacitance	C_{OSS}			245		pF
Reverse Transfer Capacitance	C_{RSS}			230		pF
Gate Resistance	R_G	$V_{GS} = 0V, V_{DS} = 0V, f = 1MHz$		0.17		Ω
SWITCHING PARAMETERS						
Total Gate Charge	Q_G	$V_{DS} = 10V, V_{GS} = 4.5V, I_D = 6.5A$ $I_G = 1mA$		20		nC
Gate Source Charge	Q_{GS}			2		nC
Gate Drain Charge	Q_{GD}			5		nC
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DS} = 10V, V_{GS} = 4.5V$ $I_D = 6.5A, R_G = 3\Omega$		6		ns
Turn-ON Rise Time	t_R			17		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			38		ns
Turn-OFF Fall-Time	t_F			13		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Body-Diode Continuous Current	I_S				2.5	A
Diode Forward Voltage	V_{SD}	$I_S = 1.0A, V_{GS} = 0V$		0.76	1	V
Body Diode Reverse Recovery Time	t_{rr}	$I_F = 6.5A, dI/dt = 100A/\mu s$		17.7		ns
Body Diode Reverse Recovery Charge	Q_{rr}			6.7		nC

Note: Surface mounted on 1 in² copper pad of FR4 board.

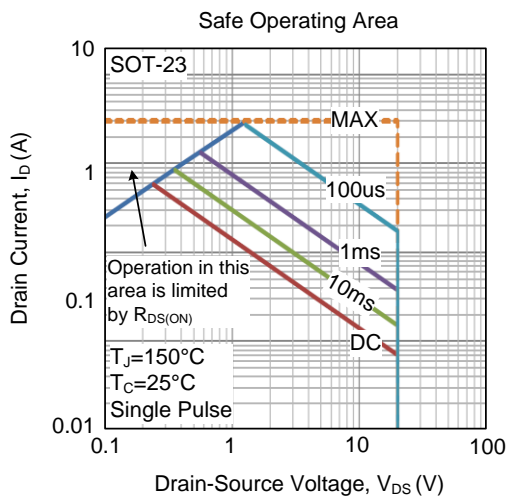
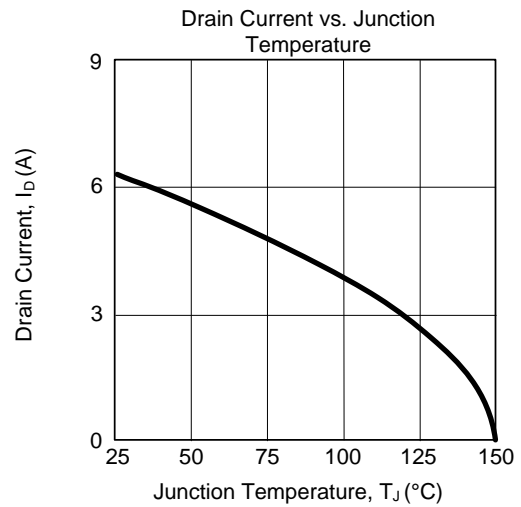
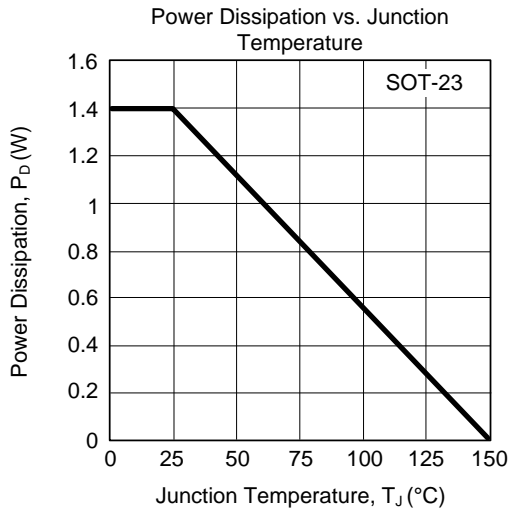
■ TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



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