



UT3416

Power MOSFET

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

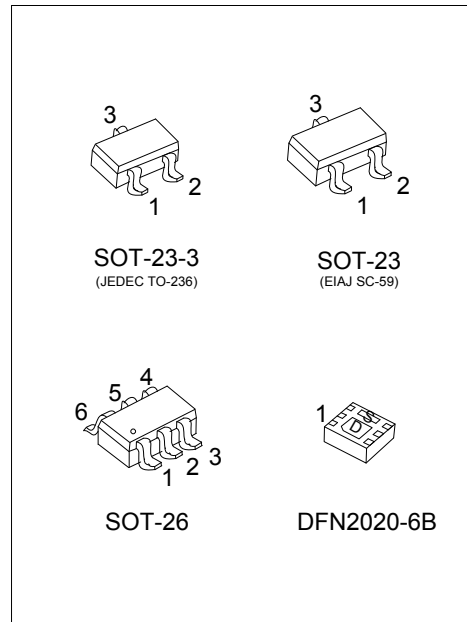
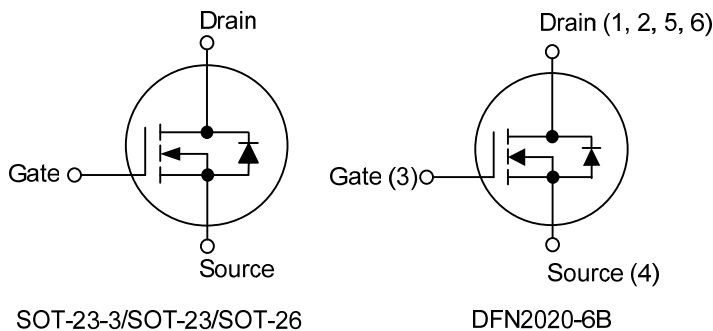
■ DESCRIPTION

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

- * $R_{DS(ON)} \leq 22 \text{ m}\Omega @ V_{GS}=4.5\text{V}, I_D = 6.5\text{A}$
- $R_{DS(ON)} \leq 28 \text{ m}\Omega @ V_{GS}=2.5\text{V}, I_D = 5.5\text{A}$
- $R_{DS(ON)} \leq 40 \text{ m}\Omega @ V_{GS}=1.8\text{V}, I_D = 5.0\text{A}$

■ SYMBOL



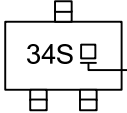
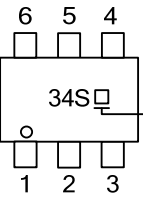
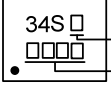
■ ORDERING INFORMATION

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
UT3416L-K06B-2020-R	UT3416G-K06B-2020-R	DFN2020-6B	D	D	G	S	D	D	Tape Reel

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

<p>UT3416G-AE2-R</p>	<p>(1) R: Tape Reel</p> <p>(2) AE2: SOT-23-3, AE3: SOT-23, AG6: SOT-26</p> <p>K06B-2020: DFN2020-6B</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
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■ MARKING

PACKAGE	MARKING
SOT-23-3 / SOT-23	 <p>34S □</p> <p>L: Lead Free G: Halogen Free</p>
SOT-26	 <p>6 5 4</p> <p>34S □</p> <p>L: Lead Free G: Halogen Free</p> <p>1 2 3</p>
DFN2020-6	 <p>34S □</p> <p>□ □ □ □</p> <p>• □ □ □ □</p> <p>L: Lead Free G: Halogen Free Date Code</p>

■ ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$, 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	P_D	1.1	W
	SOT-23		1.2	W
	SOT-26		1.15	W
	DFN2020-6B		1.6	W
Junction Temperature		T_J	+150	$^\circ\text{C}$
Storage 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. Surface mounted on 1in² copper pad of FR4 board.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	SOT-23-3	θ_{JA}	113	$^\circ\text{C/W}$
	SOT-23		104	$^\circ\text{C/W}$
	SOT-26		108	$^\circ\text{C/W}$
	DFN2020-6B		75	$^\circ\text{C/W}$

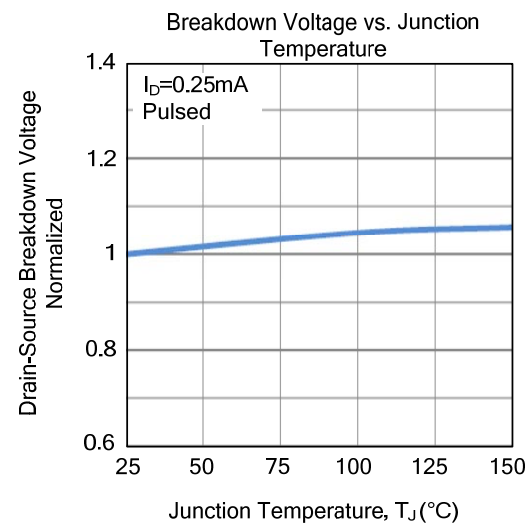
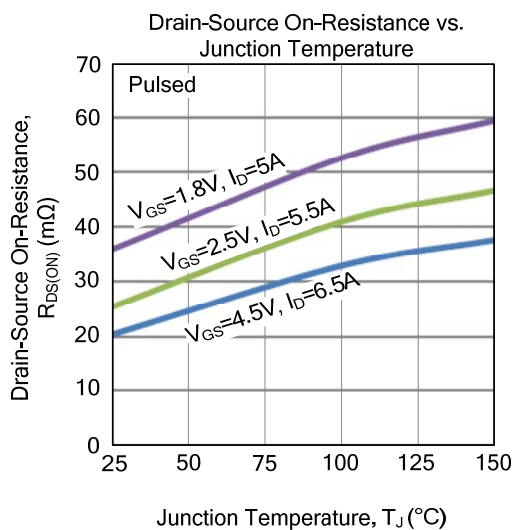
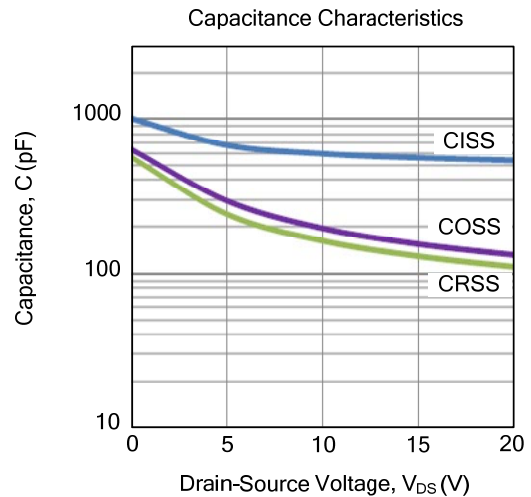
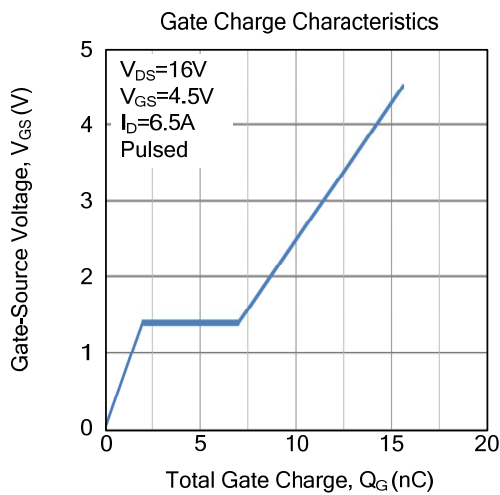
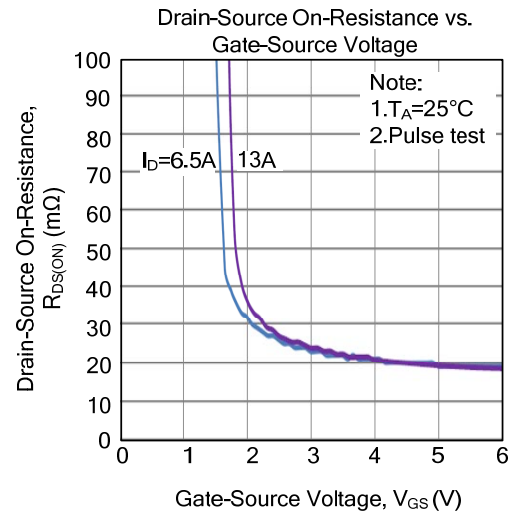
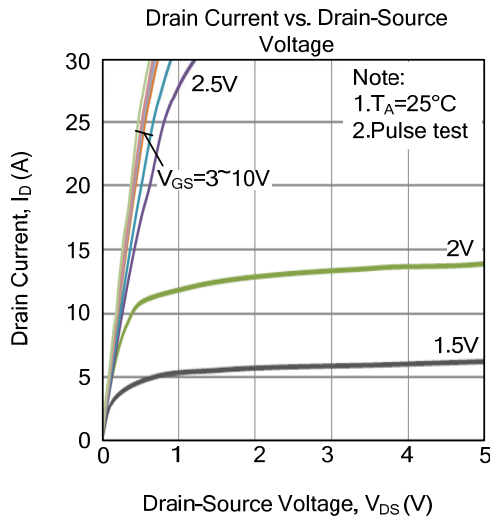
Note: Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

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

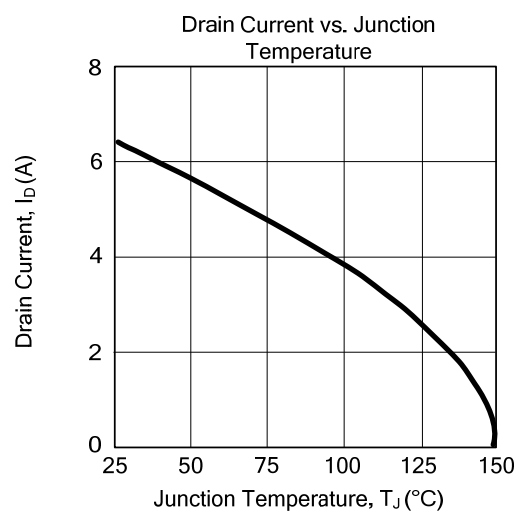
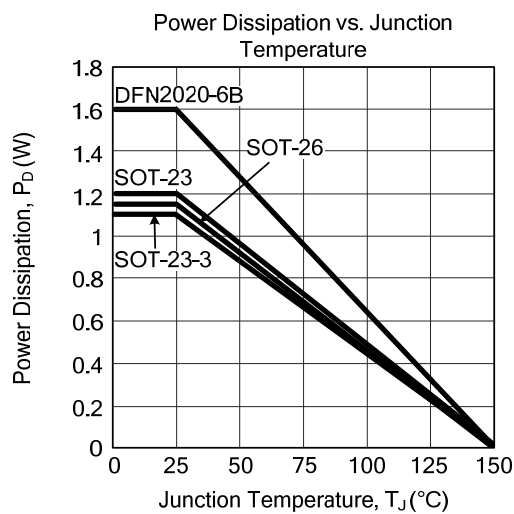
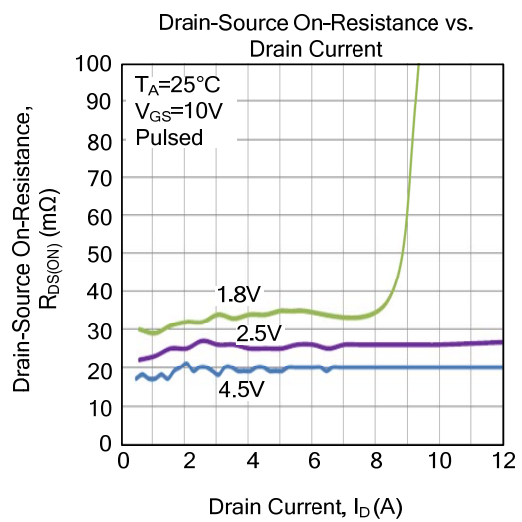
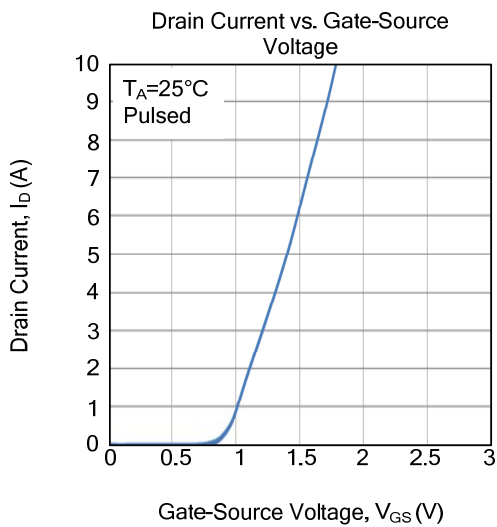
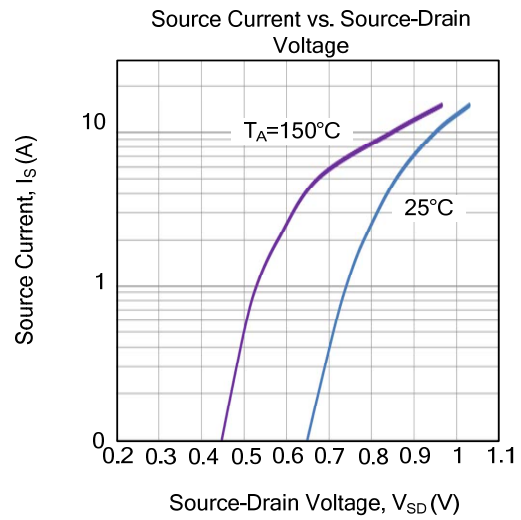
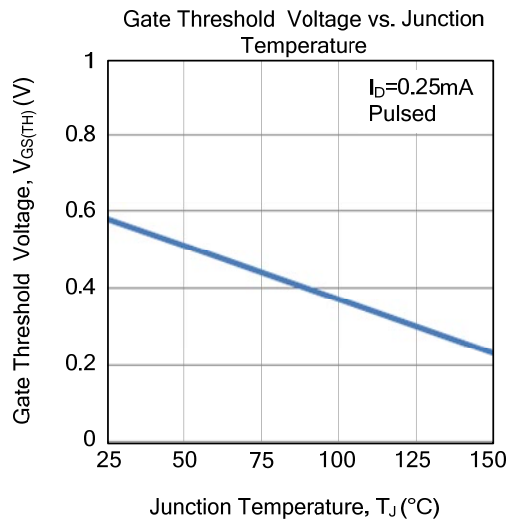
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	20			V
Drain-Source Leakage Current	I _{DSS}	V _{GS} =0V, V _{DS} =16V			1	μA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±4.5V, V _{DS} =0V			±1	μA
		V _{GS} =±8V, V _{DS} =0V			±10	μA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250μA	0.4	0.6	1.0	V
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =4.5V, I _D =6.5A		19	22	mΩ
		V _{GS} =2.5V, I _D =5.5A		25	28	mΩ
		V _{GS} =1.8V, I _D =5.0A		35	40	mΩ
DYNAMIC PARAMETERS						
Input Capacitance	C _{ISS}	V _{GS} =0V, V _{DS} =10V, f =1MHz		590		pF
Output Capacitance	C _{OSS}			194		pF
Reverse Transfer Capacitance	C _{RSS}			160		pF
SWITCHING PARAMETERS						
Total Gate Charge	Q _G	V _{DS} =16V, V _{GS} =4.5V, I _D =6.5A I _G =1mA		16		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} =10V, I _D =6.5A, R _G =3Ω		5		ns
Turn-ON Rise Time	t _R			17		ns
Turn-OFF Delay Time	t _{D(OFF)}			24		ns
Turn-OFF Fall-Time	t _F			20		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Diode Forward Voltage	V _{SD}	I _S =1.0A, V _{GS} =0V		0.76	1	V

- Notes: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%.
 2. Essentially independent of operating temperature.

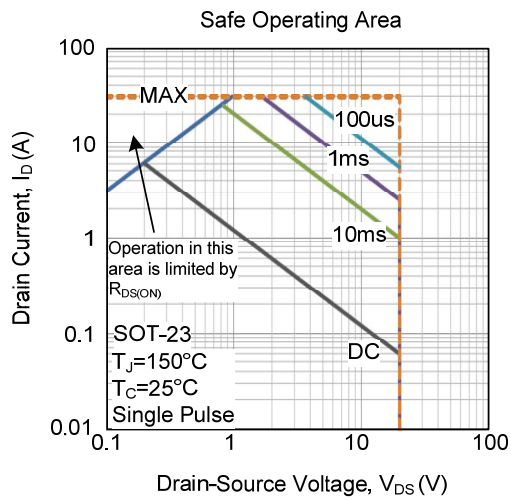
■ TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



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