

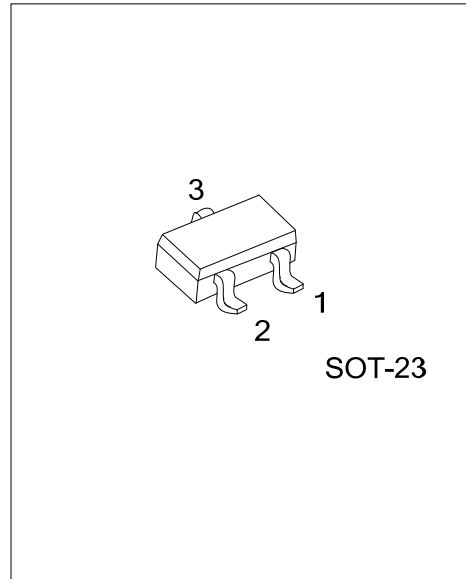


UT3419

Preliminary

Power MOSFET

20V, 3.5A P-CHANNEL ENHANCEMENT MODE FIELD EFFECT TRANSISTOR



DESCRIPTION

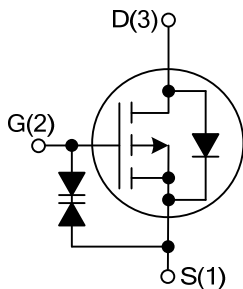
The UTC **UT3419** is a P-channel enhancement MOSFET providing designers with excellent $R_{DS(ON)}$, low gate charge. The gate voltage is as low as 2.5V. It is ESD protection.

The UTC **UT3419** can be applied in PWM applications or used as a load switch.

FEATURES

- * ESD Rating Is Up To 2000V HBM
- * $R_{DS(ON)} < 75m\Omega$ ($V_{GS} = -10V$)
- $R_{DS(ON)} < 95m\Omega$ ($V_{GS} = -4.5V$)
- $R_{DS(ON)} < 145m\Omega$ ($V_{GS} = -2.5V$)

SYMBOL



ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UT3419L-AE3-R	UT3419G-AE3-R	SOT-23	S	G	D	Tape Reel

<p>UT3419L-AE3-R</p> <ul style="list-style-type: none"> (1)Packing Type (2)Package Type (3)Lead Free 	<ul style="list-style-type: none"> (1) R: Tape Reel (2) AE3: SOT-23 (3) G: Halogen Free, L: Lead Free
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■ ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT	
Drain to Source Voltage	V_{DSS}	-20	V	
Gate to Source Voltage	V_{GSS}	± 12	V	
Continuous Drain Current (Note 1)	I_D	$T_A = 25^\circ\text{C}$	-3.5	A
		$T_A = 70^\circ\text{C}$	-2.8	A
Pulsed Drain Current (Note 2)	I_{DM}	-15	A	
Total Power Dissipation (Note 1)	P_D	$T_A = 25^\circ\text{C}$	1.4	W
		$T_A = 70^\circ\text{C}$	0.9	W
Junction Temperature	T_J	-55 ~ +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 DATA

PARAMETER	SYMBOL	RATINGS	UNIT	
Junction to Ambient (Note 1)	θ_{JA}	$t \leq 10\text{s}$	90	$^\circ\text{C/W}$
		Steady-State	125	$^\circ\text{C/W}$

Note: 1. The value of θ_{JA} is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^\circ\text{C}$. The value in any a given application depends on the user's specific board design. The current rating is based on the $t \leq 10\text{s}$ thermal resistance rating.
2. Repetitive rating, pulse width limited by junction temperature.

■ 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}	$V_{DS}=-16\text{V}, V_{GS}=0\text{V}$			-0.5	μA
Gate-Source Leakage Current	I_{GSS}	$V_{DS}=0\text{V}, V_{GS}=\pm 10\text{V}$			± 1	μA
		$V_{DS}=0\text{V}, V_{GS}=\pm 12\text{V}$			± 10	μA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=-250\mu\text{A}$	-0.7	-0.9	-1.4	V
On State Drain Current	$I_{D(ON)}$	$V_{GS}=-4.5\text{V}, V_{DS}=-5\text{V}$	-15			A
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=-10\text{V}, I_D=-3.5\text{A}$		59	75	$\text{m}\Omega$
		$V_{GS}=-4.5\text{V}, I_D=-3\text{A}$		76	95	$\text{m}\Omega$
		$V_{GS}=-2.5\text{V}, I_D=-1\text{A}$		111	145	$\text{m}\Omega$
Forward Transconductance	g_{FS}	$V_{DS}=-5\text{V}, I_D=-3.5\text{A}$		6.8		S
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	$V_{DS}=-10\text{V}, V_{GS}=0\text{V}, f=1\text{MHz}$		512	620	pF
Output Capacitance	C_{OSS}			77		pF
Reverse Transfer Capacitance	C_{RSS}			62		pF
Gate Resistance	R_G	$V_{GS}=0\text{V}, V_{DS}=0\text{V}, f=1\text{MHz}$		9.2	13	Ω
SWITCHING PARAMETERS						
Total Gate Charge	Q_G	$V_{DS}=-10\text{V}, V_{GS}=-4.5\text{V}, I_D=-3.5\text{A}$		5.5	6.6	nC
Gate-Source Charge	Q_{GS}			0.8		nC
Gate-Drain Charge	Q_{GD}			1.9		nC
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DS}=-10\text{V}, V_{GS}=-10\text{V}, R_L=2.8\Omega, R_{GEN}=3\Omega$		5		ns
Turn-ON Rise Time	t_R			6.7		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			28		ns
Turn-OFF Fall Time	t_F			13.5		ns

■ ELECTRICAL CHARACTERISTICS (Cont.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage	V_{SD}	$I_S = -1A, V_{GS} = 0V$	-0.65	-0.81	-0.95	V
Maximum Body-Diode Continuous Current	I_S				-2	A
Body Diode Reverse Recovery Time	t_{rr}	$I_F = -3.5A, di/dt = 100A/\mu s$		9.8	12	ns
Body Diode Reverse Recovery Charge	Q_{RR}	$I_F = -3.5A, di/dt = 100A/\mu s$		2.7		nC

Note: 3. The θ_{JA} is the sum of the thermal impedance from junction to lead θ_{JL} and lead to ambient.

4. These tests are performed with the device mounted on 1 in² FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^\circ C$. The SOA curve provides a single pulse rating.

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