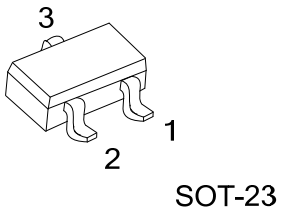
20V, 3.5A P-CHANNEL ENHANCEMENT MODE FIELD EFFECT TRANSISTOR



SOT-23

■ DESCRIPTION

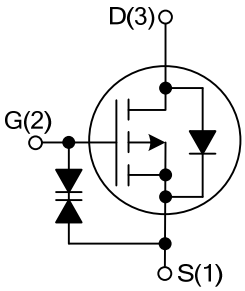
The UTC **UT3419** is a P-channel enhancement MOSFET providing designers with excellent $R_{DS(ON)}$, low gate charge. The gate voltage is as low as 2.5V. It is ESD protection.

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

■ FEATURES

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

UT3419L-AE3-R (1)Packing Type (2)Package Type (3)Lead Free	(1) R: Tape Reel (2) AE3: SOT-23 (3) G: Halogen Free, L: Lead Free

■ ABSOLUTE MAXIMUM RATINGS (T_A =25°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)	T_A =25°C	I_D	-3.5	A
	T_A =70°C		-2.8	A
Pulsed Drain Current (Note 2)		I_{DM}	-15	A
Total Power Dissipation (Note 1)	T_A =25°C	P_D	1.4	W
	T_A =70°C		0.9	W
Junction Temperature		T_J	-55 ~ +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	RATINGS	UNIT
Junction to Ambient (Note 1)	t ≤ 10s	θ_{JA}	90	°C/W
	Steady-State		125	°C/W

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

■ 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}=0V			-0.5	μA
Gate-Source Leakage Current	I_{GSS}	V_{DS}=0V ,V_{GS}=±10V			±1	μA
		V_{DS}=0V ,V_{GS}=±12V			±10	μA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}= V_{GS}, I_D=-250μA	-0.7	-0.9	-1.4	V
On State Drain Current	$I_{D(ON)}$	V_{GS}=-4.5V, V_{DS}=-5V	-15			A
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=-10V,I_D=-3.5A		59	75	mΩ
		V_{GS}=-4.5V, I_D=-3A		76	95	mΩ
		V_{GS}=-2.5V, I_D=-1A		111	145	mΩ
Forward Transconductance	g_{FS}	V_{DS}=-5V, I_D=-3.5A		6.8		S
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	V_{DS}=-10V,V_{GS}=0V,f =1MHz		512	620	pF
Output Capacitance	C_{OSS}			77		pF
Reverse Transfer Capacitance	C_{RSS}			62		pF
Gate Resistance	R_G	V_{GS} =0V, V_{DS} =0V, f =1MHz		9.2	13	Ω
SWITCHING PARAMETERS						
Total Gate Charge	Q_G	V_{DS}=-10V,V_{GS}=-4.5V,I_D=-3.5A		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}=-10V,V_{GS}=-10V, R_L=2.8Ω, R_{GEN}=3Ω		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/μs		9.8	12	ns
Body Diode Reverse Recovery Charge	Q_{RR}	I_F=-3.5A, dI/dt=100A/μs		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 in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C. The SOA curve provides a single pulse rating.