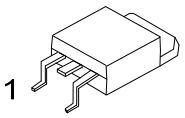
UK3919

Power MOSFET

SWITCHING N-CHANNEL POWER MOSFET



TO-252

*Pb-free plating product number:UK3919L

■ DESCRIPTION

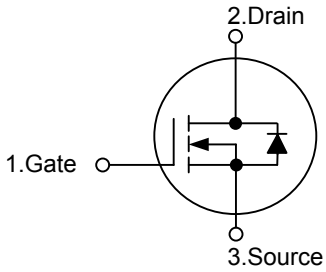
This **UK3919** N-Channel Logic Level MOSFET is produced using UTC Semiconductor advanced Power Trench process which has been tailored to make the on-state resistance minimum and yet maintain low gate charge for superior switching performance especially.

The **UK3919** is well suited for where low in-line power loss is needed in a very small outline surface mount package, such as low voltage and battery powered applications.

■ FEATURES

* $R_{DS(ON)}$ = 5.6mΩ @V_{GS} = 10 V
* Low capacitance
* Optimized gate charge
* Fast switching capability
* Avalanche energy specified

■ SYMBOL



■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Normal	Lead Free Plating		1	2	3	
UK3919-TN3-R	UK3919L-TN3-R	TO-252	G	D	S	Tape Reel
UK3919-TN3-T	UK3919L-TN3-T	TO-252	G	D	S	Tube

UK3919L-TN3-R (1)Packing Type (2)Package Type (3)Lead Plating	(1) R: Tape Reel, T: Tube (2) TN3:TO-252 (3) L: Lead Free Plating, Blank: Pb/Sn

■ ABSOLUTE MAXIMUM RATINGS (T_C = 25℃, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Drain to Source Voltage	V_{DSS}	25	V
Gate to Source Voltage	V_{GSS}	±20	V
Continuous Drain Current	I_D	±64	A
Pulsed Drain Current (Note1)	I_{DM}	±256	A
Single Avalanche Current (Note2)	I_{AS}	27	A
Single Avalanche Energy (Note2)	E_{AS}	73	mJ
Total Power Dissipation	P_D	36	W
Storage Temperature	T_{STG}	-55 ~ +150	℃

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.

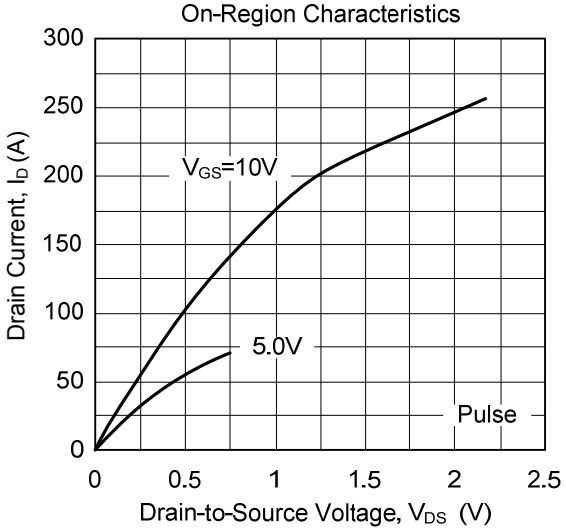
■ ELECTRICAL CHARACTERISTICS (T_C =25℃, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} =25 V, V_{GS} =0 V			10	μA
Gate-Body Leakage Current	I_{GSS}	V_{DS} =0 V, V_{GS} =±20V			±100	nA
ON CHARACTERISTICS						
Gate-Threshold Voltage	$V_{GS(OFF)}$	V_{DS} =10V, I_D =1mA	2.0	2.5	3.0	V
Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS} =10 V, I_D =32 A		4.5	5.6	mΩ
		V_{GS} =5.0 V, I_D =16 A		6.8	13.7	
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	V_{DS} =10V, V_{GS} =0V, f=1MHz		2050		pF
Output Capacitance	C_{OSS}			460		
Reverse Transfer Capacitance	C_{RSS}			330		
SWITCHING PARAMETERS						
Gate to Source Charge	Q_G	V_{DD} =20V, V_{GS} =10 V,I_D =64 A		42		nC
Gate Charge at Threshold	Q_{GS}			8		
Gate to Drain Charge	Q_{GD}			15		
Turn-ON Delay Time	$t_{D(ON)}$	V_{DD} =12.5V, I_D=32 A, V_{GS} =10V, R_G =10 Ω		16		ns
Turn-ON Rise Time	t_R			19		
Turn-OFF Delay Time	$t_{D(OFF)}$			53		
Turn-OFF Fall-Time	t_F			22		
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Body Diode Forward Voltage	V_{SD}	I_F=64 A, V_{GS}=0 V		0.97		V
Reverse Recovery Time	t_{RR}	I_F= 64 A,V_{GS}=0 V ,di/dt = 100 A/μs		23		ns
Reverse Recovery Charge	Q_{RR}			11		nC

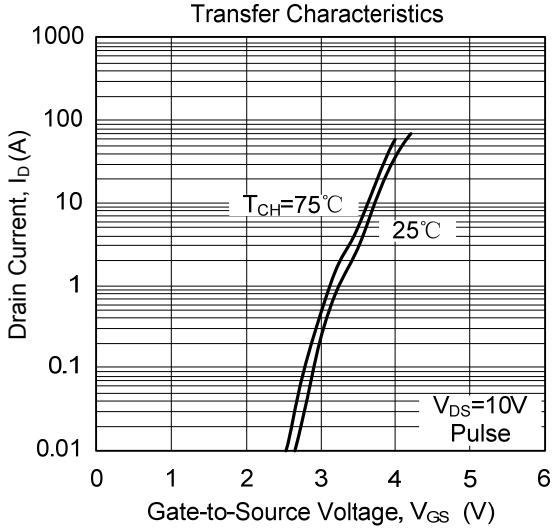
Notes: 1. PW ≤ 10 μs, Duty Cycle ≤ 1%
2. Starting T_{CH}= 25℃, V_{DD} = 12.5 V, R_G = 25Ω, V_{GS} = 20 → 0 V

■ TYPICAL CHARACTERISTICS

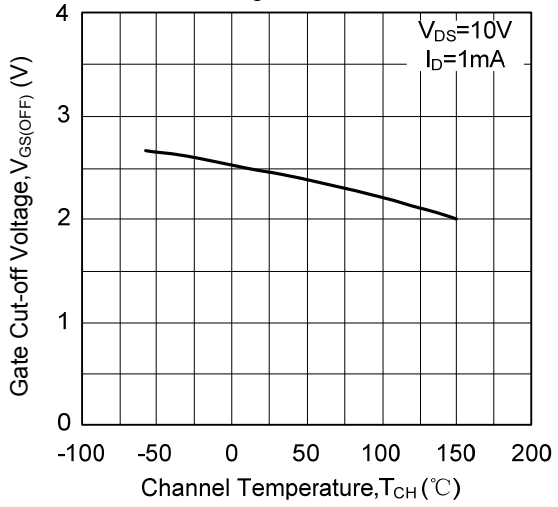
On-Region Characteristics



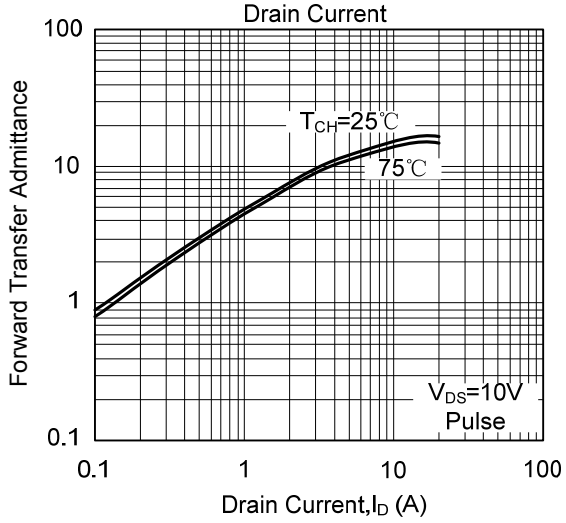
Transfer Characteristics



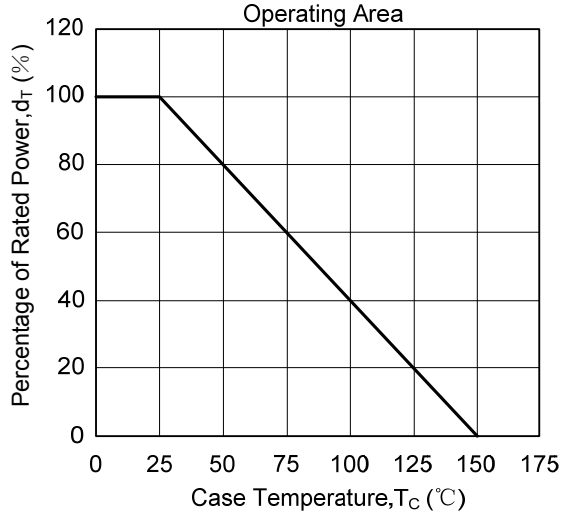
Gate Cut-off Voltage vs. Channel Temperature



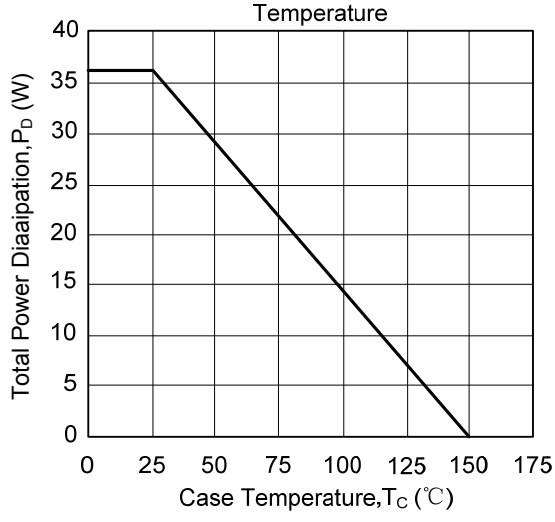
Forward Transfer Admittance vs. Drain Current



Derating Factor of Forward Bias Safe Operating Area

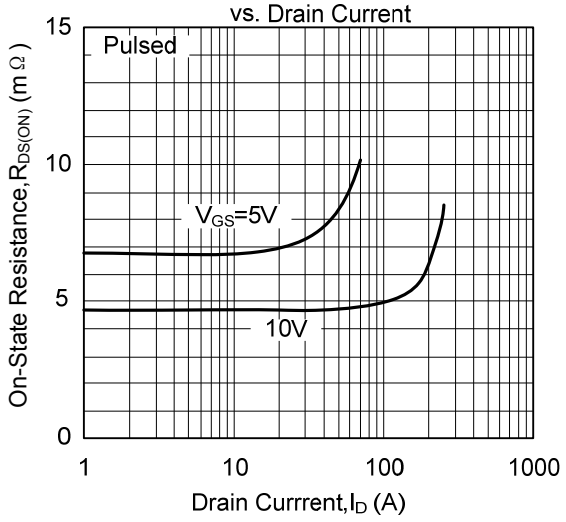


Total Power Dissipation vs. Case Temperature

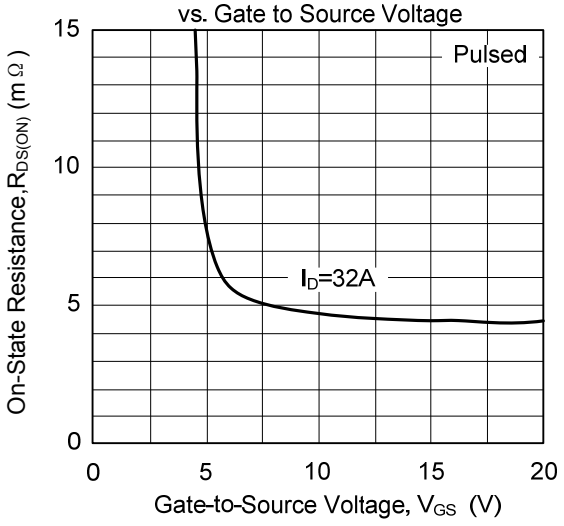


■ TYPICAL CHARACTERISTICS(Cont.)

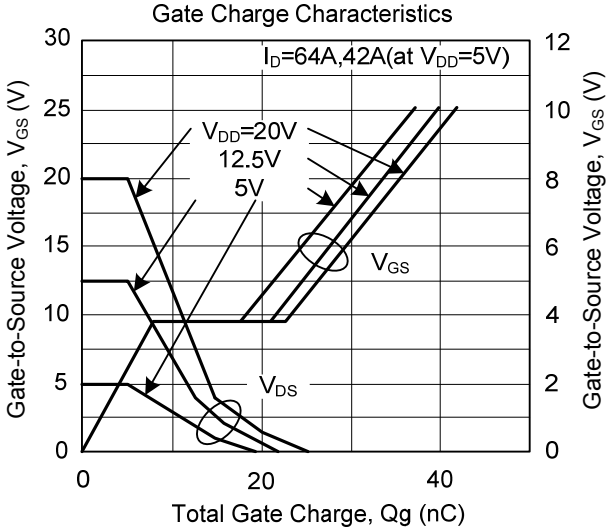
Drain to Source On-State Resistance vs. Drain Current



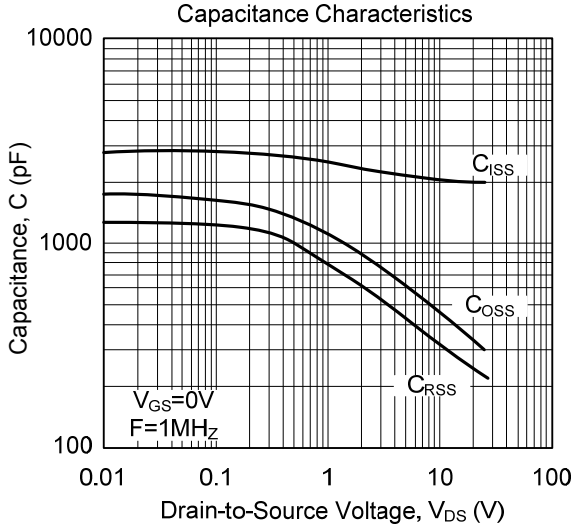
Drain to Source On-State Resistance vs. Gate to Source Voltage



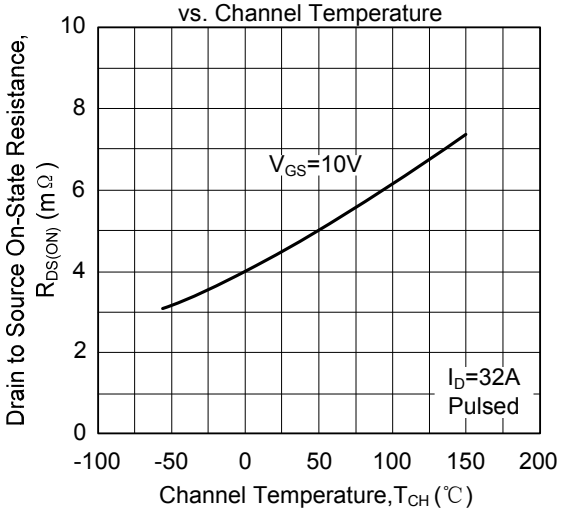
Gate Charge Characteristics



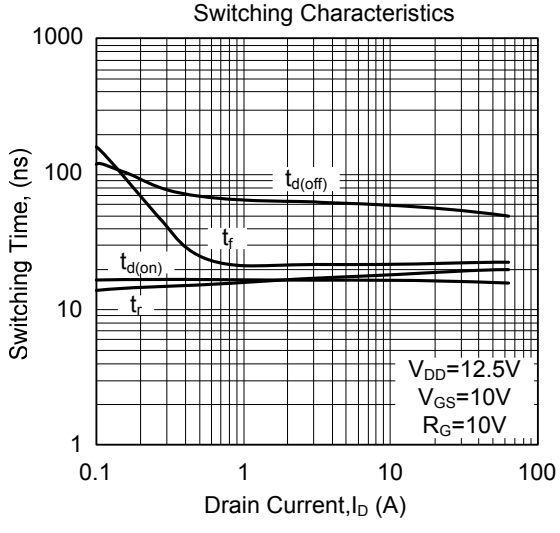
Capacitance Characteristics



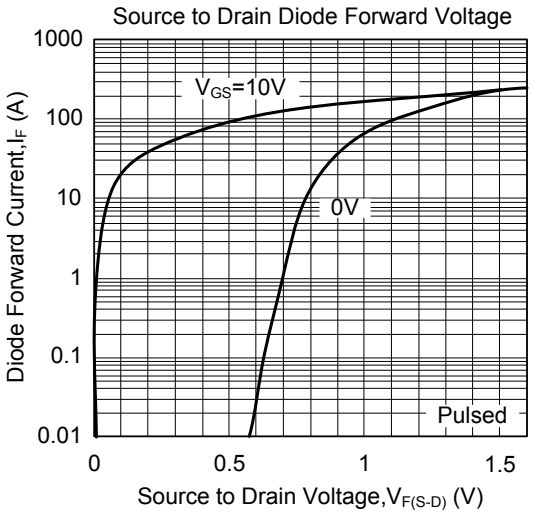
Drain to Source On-State Resistance vs. Channel Temperature

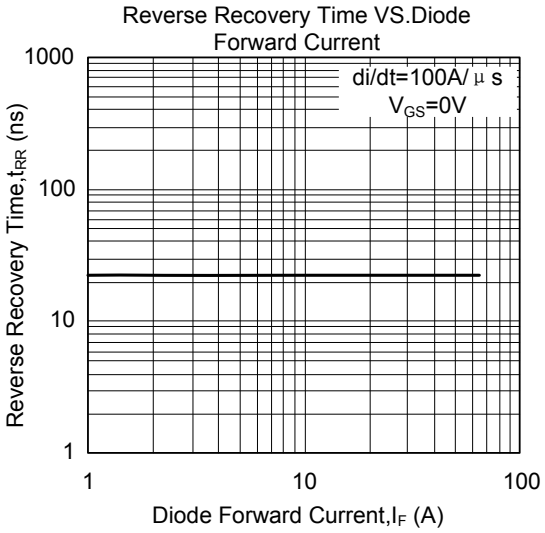


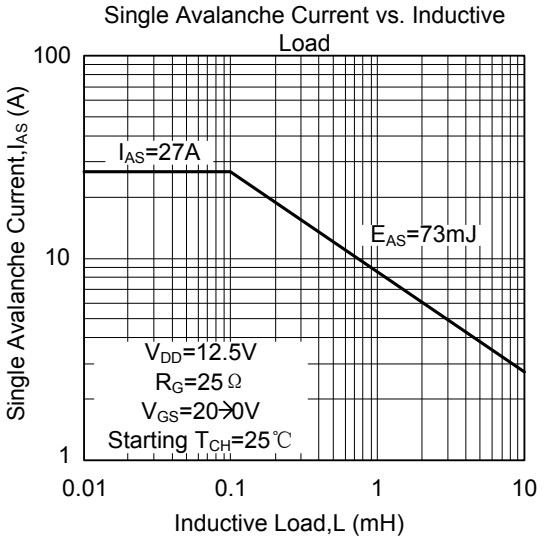
Switching Characteristics

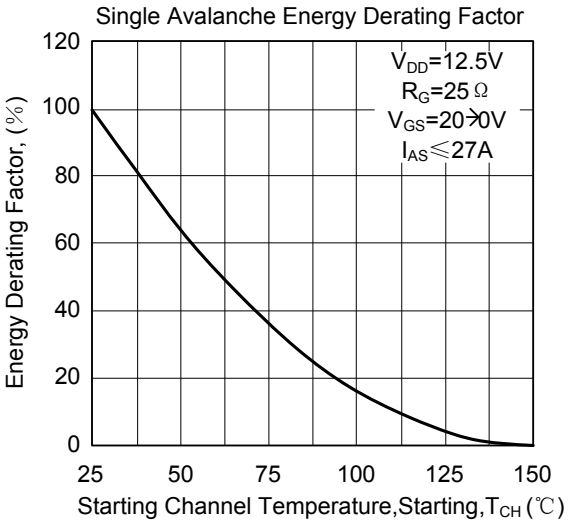


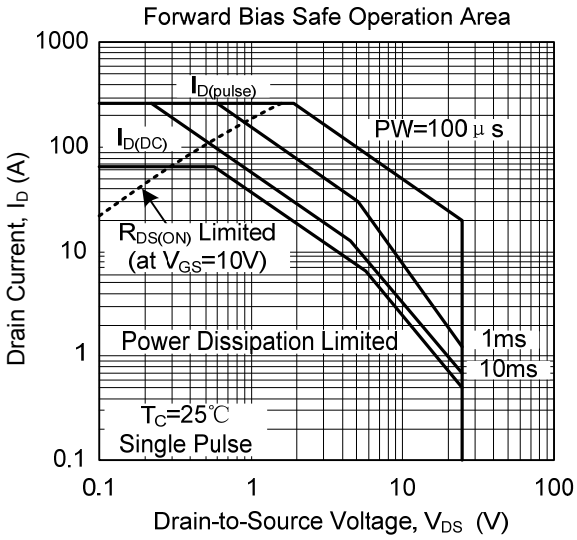
■ TYPICAL CHARACTERISTICS(Cont.)











■ TYPICAL CHARACTERISTICS(Cont.)