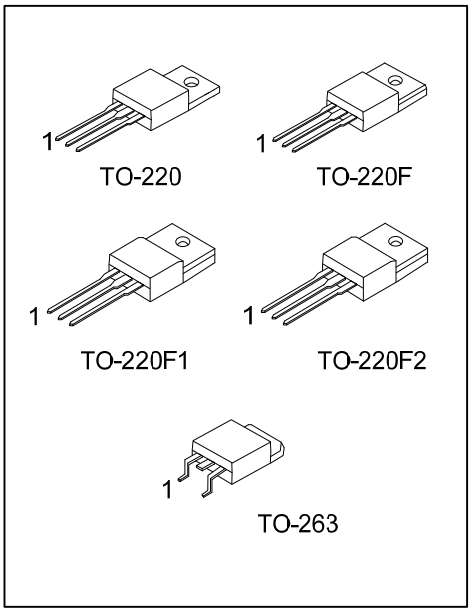
UK3568

Power MOSFET

SILICON N-CHANNEL MOS TYPE



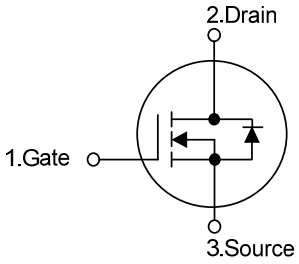
■ DESCRIPTION

The **UK3568** uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with low gate voltages. This device is suitable for use as a load switch or in PWM applications.

■ FEATURES

* $R_{DS(ON)} \leq 0.52\ \Omega$ @ V_{GS}=10V, I_D=6.0A
* Low Capacitance
* Low Gate Charge
* Fast Switching Capability
* Avalanche Energy Specified

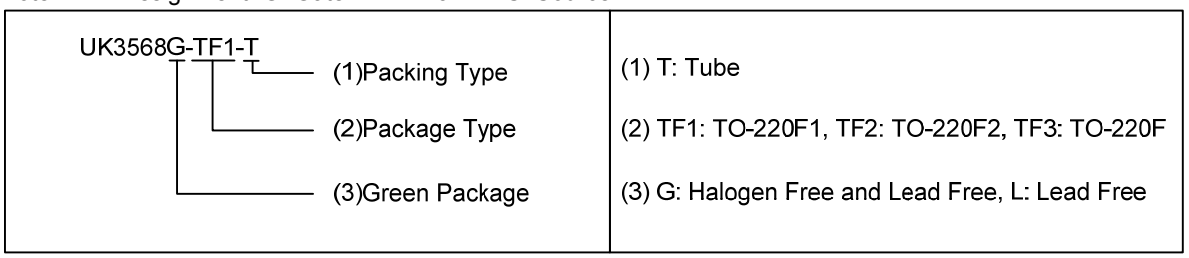
■ SYMBOL



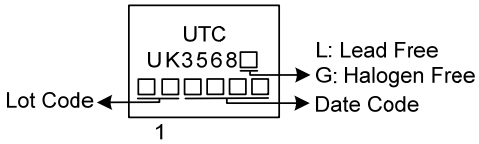
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UK3568L-TF1-T	UK3568G-TF1-T	TO-220F1	G	D	S	Tube
UK3568L-TF2-T	UK3568G-TF2-T	TO-220F2	G	D	S	Tube
UK3568L-TF3-T	UK3568G-TF3-T	TO-220F	G	D	S	Tube

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



■ MARKING



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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	500	V
Drain-Gate Voltage (R_G=20kΩ)		V_{DGR}	500	V
Gate-Source Voltage		V_{GSS}	±30	V
Continuous Drain Current (Note 2)	DC	I_D	12	A
	Pulse(t=1ms)		48	
Avalanche Current		I_{AR}	12	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	364	mJ
	Repetitive (Note 4)	E_{AR}	4	
Power Dissipation (T_C=25°C)	TO-220/TO-263	P_D	185	W
	TO-220F/TO-220F1		40	W
	TO-220F2		42	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. Ensure that the temperature will not exceed 150°C.
3. V_{DD}=90V, T_{CH}= 25°C(initial), L=4.3mH, I_{AR}=12A, R_G=25Ω.
4. Repetitive Rating: Pulse width limited by maximum junction temperature.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient		θ_{JA}	62.5	°C/W
Junction to Case	TO-220/TO-263	θ_{JC}	0.675	°C/W
	TO-220F/TO-220F1		3.125	°C/W
	TO-220F2		2.98	°C/W

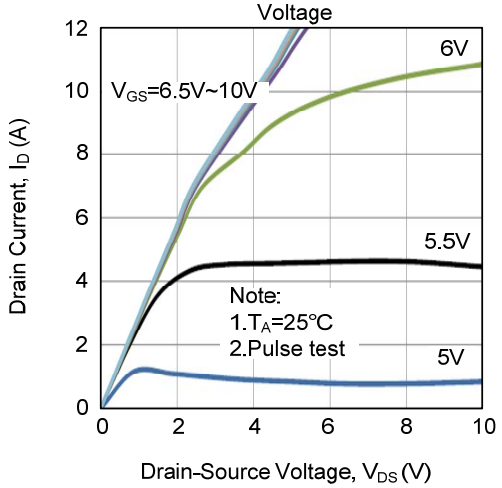
■ ELECTRICAL CHARACTERISTICS (T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250μA	500			V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=500V, V_{GS}=0V			100	μA
Gate-Source Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}= ±30V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=10V , I_D=250μA	2.0		4.0	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=6A		0.4	0.52	Ω
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	V_{DS}=25V, V_{GS}=0V, f=1MHz		1700		pF
Output Capacitance	C_{OSS}			200		pF
Reverse Transfer Capacitance	C_{RSS}			38		pF
SWITCHING PARAMETERS						
Total Gate Charge	Q_G	V_{DD}=400V, V_{GS}=10V, I_D=12A		56		nC
Gate Source Charge	Q_{GS}			15		nC
Gate Drain Charge	Q_{GD}			18		nC
Turn-ON Delay Time	$t_{D(ON)}$	V_{GS}=10V, V_{DD}=100V, I_D=12A, R_G=25Ω		24		ns
Turn-ON Rise Time	t_R			28		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			150		ns
Turn-OFF Fall-Time	t_F			42		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Continuous Drain-Source Diode Forward Current	I_S				12	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}				48	A
Diode Forward Voltage	V_{SD}	I_S=12A, V_{GS}=0V			1.7	V
Reverse Recovery Time	t_{rr}	I_S=12A, V_{GS}=0V, dI/dt=100A/μs		360		ns
Reverse Recovery Charge	Q_{rr}			5		μC

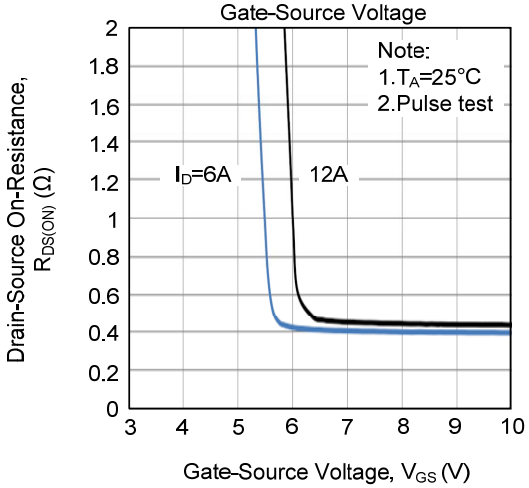
Notes: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%.
2. Essentially independent of operating temperature.

■ TYPICAL CHARACTERISTICS

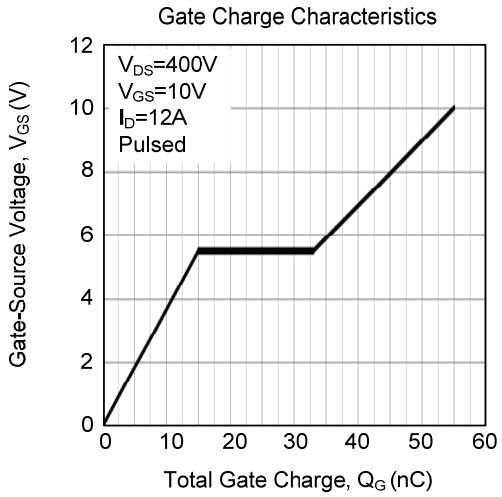
Drain Current vs. Drain-Source Voltage



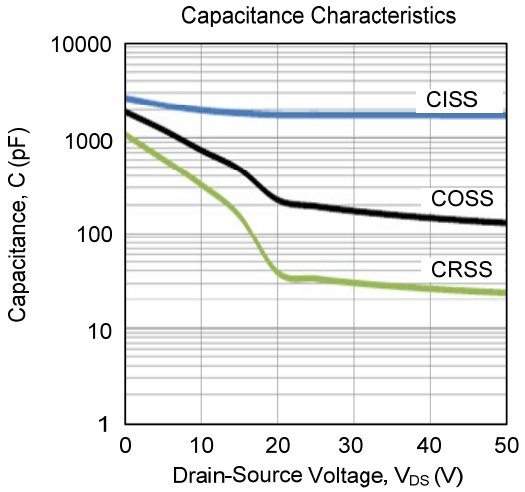
Drain-Source On-Resistance vs. Gate-Source Voltage



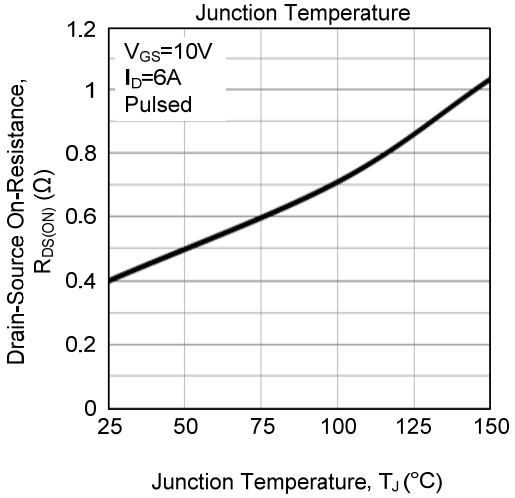
Gate Charge Characteristics



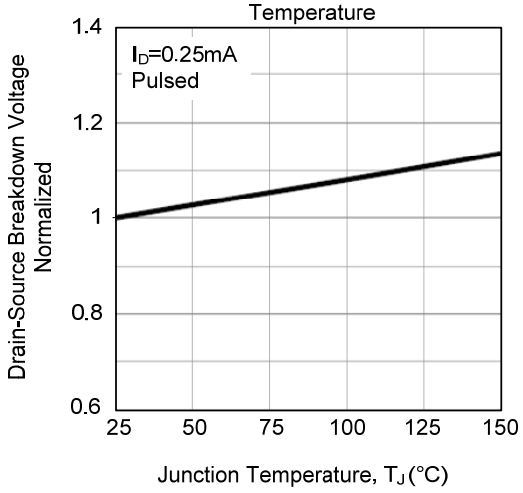
Capacitance Characteristics



Drain-Source On-Resistance vs. Junction Temperature

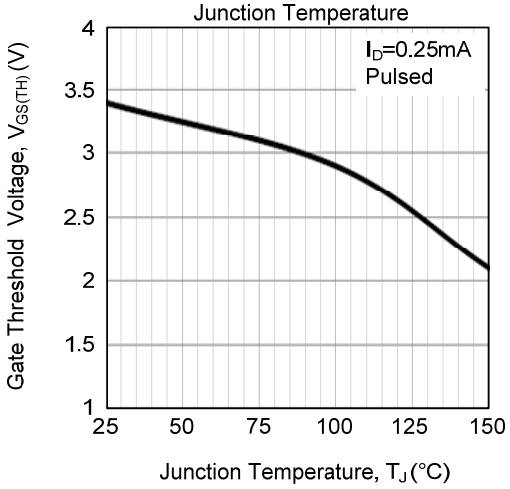


Breakdown Voltage vs. Junction Temperature

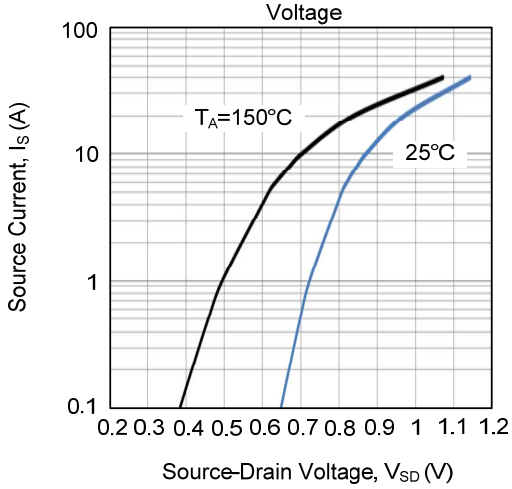


■ TYPICAL CHARACTERISTICS (Cont.)

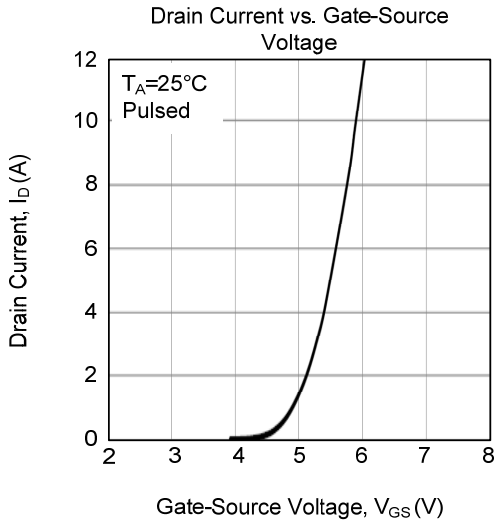
Gate Threshold Voltage vs. Junction Temperature



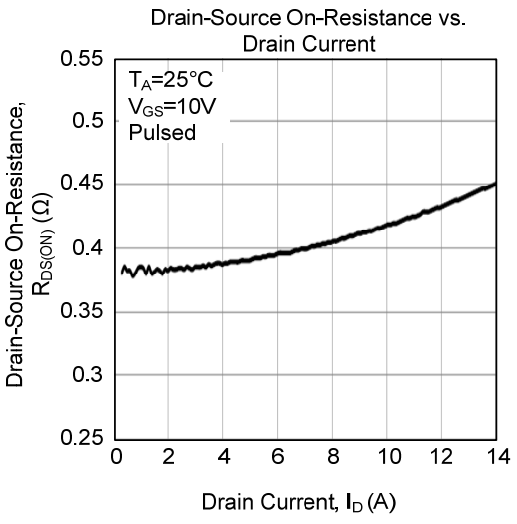
Source Current vs. Source-Drain Voltage



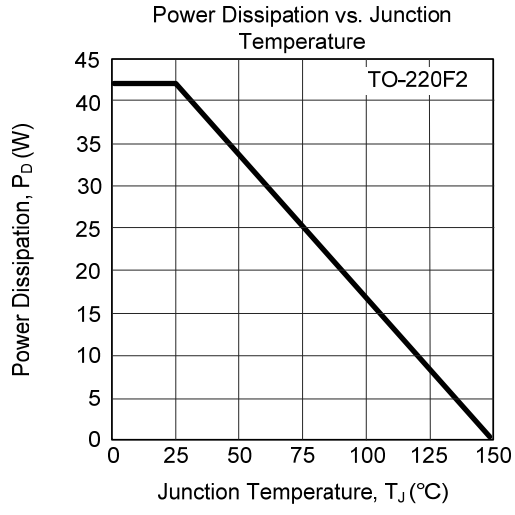
Drain Current vs. Gate-Source Voltage



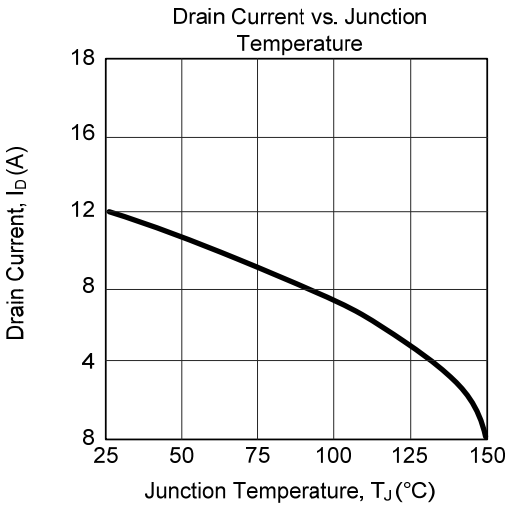
Drain-Source On-Resistance vs. Drain Current



Power Dissipation vs. Junction Temperature



Drain Current vs. Junction Temperature



■ TYPICAL CHARACTERISTICS (Cont.)