



**UK4145**

Preliminary

*Power MOSFET*

**SWITCHING N-CHANNEL  
POWER MOSFET**

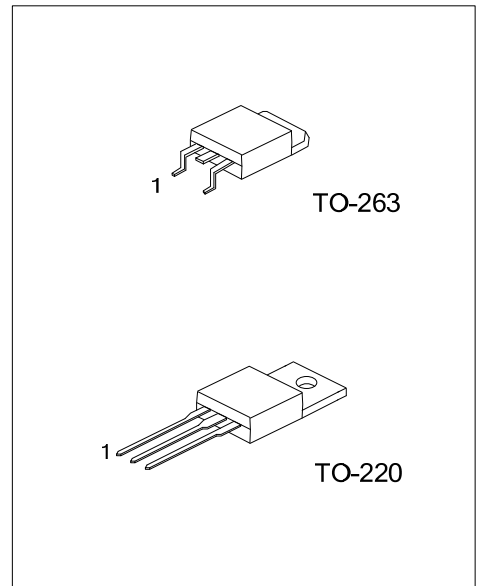
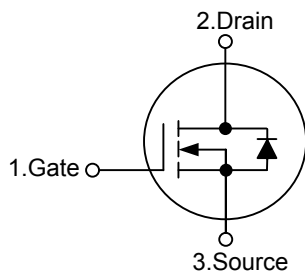
■ DESCRIPTION

The UTC **UK4145** is N-channel power MOSFET, suitable for high current switching applications.

■ FEATURES

- \* Low on-state resistance:  
 $R_{DS(ON)} = 10m\Omega$  (Max.) @  $V_{GS} = 10V, I_D = 42A$
- \* Low input capacitance:  
 $C_{ISS} = 5300pF$  (Typ.)

■ SYMBOL



■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UK4145L-TA3-T	UK4145G-TA3-T	TO-220	G	D	S	Tube
UK4145L-TQ2-T	UK4145G-TQ2-T	TO-263	G	D	S	Tube
UK4145L-TQ2-R	UK4145G-TQ2-R	TO-263	G	D	S	Tape Reel

<p>UK4145G-TA3-T</p> <p>(1) Packing Type (2) Package Type (3) Lead Plating</p>	<p>(1) T: Tube, R: Tape Reel (2) TA3: TO-220, TQ2: TO-263 (3) L: Lead Free, G: Halogen Free</p>
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■ ABSOLUTE MAXIMUM RATINGS ( $T_A=25^\circ\text{C}$ , unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage ( $V_{GS}=0\text{ V}$ )	$V_{DSS}$	60	V
Gate-Source Voltage ( $V_{DS}=0\text{ V}$ )	$V_{GSS}$	$\pm 20$	V
Drain Current	DC ( $T_C=25^\circ\text{C}$ )	$I_D$	$\pm 84$
	Pulse (Note 2)	$I_{DM}$	$\pm 215$
Single Avalanche Current (Note 3)	$I_{AS}$	32	A
Single Avalanche Energy (Note 3)	$E_{AS}$	102	mJ
Power Dissipation ( $T_A=25^\circ\text{C}$ )	$P_D$	1.5	W
Junction Temperature	$T_J$	150	$^\circ\text{C}$
Strong Temperature	$T_{STG}$	-55 ~ +150	$^\circ\text{C}$

Note: 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.  $PW \leq 10\mu\text{s}$ , Duty Cycle  $\leq 1\%$

3.  $L = 100\mu\text{H}$ ,  $V_{DD} = 30\text{V}$ ,  $R_G = 25\Omega$ ,  $V_{GS} = 20 \rightarrow 0\text{V}$ , Starting  $T_J = 25^\circ\text{C}$ ,

■ THERMAL DATA

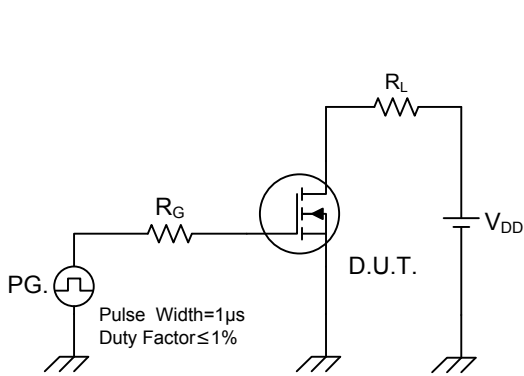
PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	$\theta_{JA}$	83.3	$^\circ\text{C/W}$
Junction to Case	$\theta_{JC}$	1.49	$^\circ\text{C/W}$

■ ELECTRICAL CHARACTERISTICS ( $T_A=25^\circ\text{C}$ , unless otherwise noted)

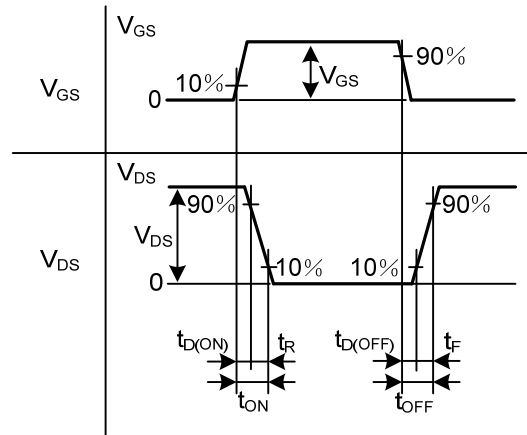
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS} = 0\text{V}$ , $I_D = 250\mu\text{A}$	60			
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS} = 60\text{V}$ , $V_{GS} = 0\text{V}$			10	$\mu\text{A}$
Gate-Source Leakage Current	$I_{GSS}$	$V_{DS} = 0\text{V}$ , $V_{GS} = \pm 20\text{V}$			$\pm 100$	nA
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	$V_{GS(OFF)}$	$V_{DS} = 10\text{V}$ , $I_D = 1\text{mA}$	2.0	3.0	4.0	V
Drain to Source On-state Resistance (Note)	$R_{DS(ON)}$	$V_{GS} = 10\text{V}$ , $I_D = 42\text{A}$		7	10	m $\Omega$
<b>DYNAMIC PARAMETERS</b>						
Input Capacitance	$C_{ISS}$	$V_{DS} = 10\text{V}$ , $V_{GS} = 0\text{V}$ , $f = 1\text{MHz}$		5300		pF
Output Capacitance	$C_{OSS}$			540		Pf
Reverse Transfer Capacitance	$C_{RSS}$			330		pF
<b>SWITCHING PARAMETERS</b>						
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DD} = 30\text{V}$ , $V_{GS} = 10\text{V}$ $I_D = 42\text{A}$ , $R_G = 0\Omega$		25		ns
Turn-ON Rise Time	$t_R$			17		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			66		ns
Turn-OFF Fall-Time	$t_F$			9		ns
Total Gate Charge	$Q_G$	$V_{DD} = 48\text{V}$ , $V_{GS} = 10\text{V}$ , $I_D = 84\text{A}$		90		nC
Gate Source Charge	$Q_{GS}$			21		nC
Gate Drain Charge	$Q_{GD}$			30		nC
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
Drain-Source Diode Forward Voltage (Note)	$V_{SD}$	$V_{GS} = 0\text{V}$ , $I_S = 84\text{A}$		1.0	1.5	V
Reverse Recovery Time	$t_{RR}$	$I_S = 84\text{A}$ , $V_{GS} = 0\text{V}$ , $di/dt = 100\text{A}/\mu\text{s}$		43		ns
Reverse Recovery Charge	$Q_{RR}$			62		nC

Note: Pulsed

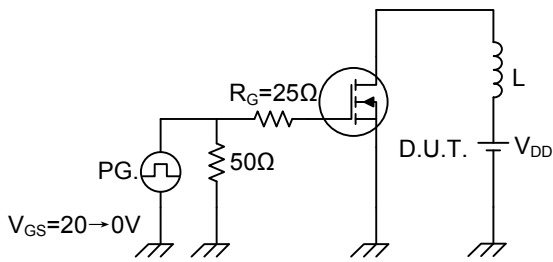
■ TEST CIRCUITS AND WAVEFORMS



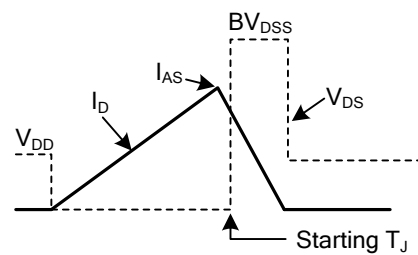
Switching Test Circuit



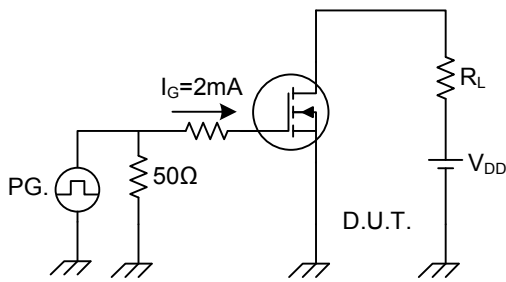
Switching Waveforms



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms



Gate Charge Test Circuit

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