



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

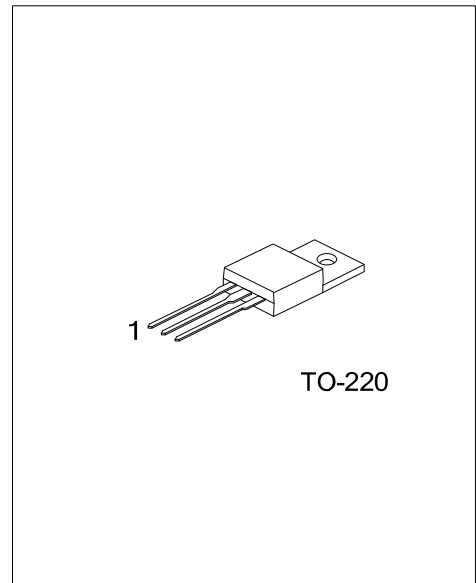
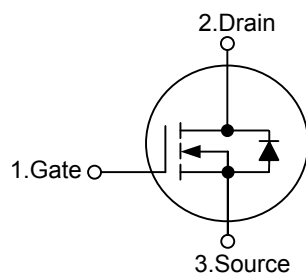
* Low on-state resistance:

$R_{DS(ON)} = 10\text{m}\Omega$ (Max.) @ $V_{GS} = 10\text{V}$, $I_D = 42\text{A}$

* Low input capacitance:

$C_{ISS} = 5300\text{pF}$ (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

UK4145G-TA3-T (1)Packing Type (2)Package Type (3) Lead Plating		(1) T: Tube (2) TA3: TO-220 (3) G: Halogen Free, L: Lead Free
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■ ABSOLUTE MAXIMUM RATINGS (Ta=25°C, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage (V _{GS} =0 V)	V _{DSS}	60	V
Gate-Source Voltage (V _{DS} =0 V)	V _{GSS}	±20	V
Drain Current	DC (T _C =25°C)	I _D	±84
	Pulse (Note 2)	I _{DM}	±215
Single Avalanche Current (Note 3)	I _{AS}	32	A
Single Avalanche Energy (Note 3)	E _{AS}	102	mJ
Power Dissipation (Ta=25°C)	P _D	1.5	W
Junction Temperature	T _J	150	°C
Strong Temperature	T _{STG}	-55 ~ +150	°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≤10μs, Duty Cycle≤ 1%

3. L = 100μH, V_{DD} =30V, R_G =25Ω, V_{GS} =20→ 0V, Starting T_J =25°C,

■ THERMAL DATA

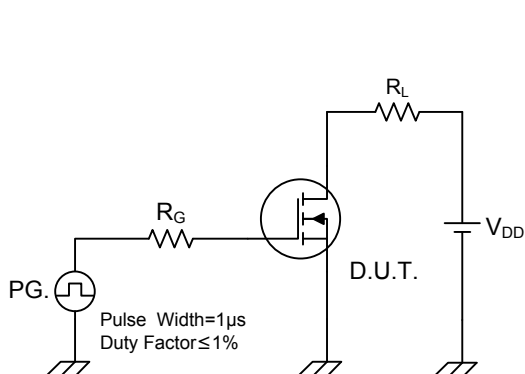
PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ _{JA}	83.3	°C/W
Junction to Case	θ _{JC}	1.49	°C/W

■ ELECTRICAL CHARACTERISTICS (Ta=25°C, unless otherwise noted)

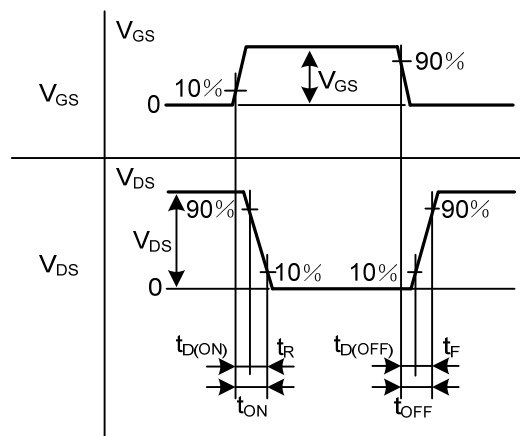
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D = 250μA	60			
Drain-Source Leakage Current	I _{DSS}	V _{DS} =60V, V _{GS} =0V			10	μA
Gate-Source Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(OFF)}	V _{DS} =10V, I _D =1mA	2.0	3.0	4.0	V
Drain to Source On-state Resistance (Note)	R _{DS(ON)}	V _{GS} =10 V, I _D =42 A		7	10	mΩ
DYNAMIC PARAMETERS						
Input Capacitance	C _{ISS}	V _{DS} =10V, V _{GS} =0V, f=1MHz		5300		pF
Output Capacitance	C _{OSS}			540		Pf
Reverse Transfer Capacitance	C _{RSS}			330		pF
SWITCHING PARAMETERS						
Turn-ON Delay Time	t _{D(ON)}	V _{DD} =30V, V _{GS} =10V I _D =42A, R _G =0Ω		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} =48V, V _{GS} =10V, I _D =84A		90		nC
Gate Source Charge	Q _{GS}			21		nC
Gate Drain Charge	Q _{GD}			30		nC
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage (Note)	V _{SD}	V _{GS} =0V, I _S =84A		1.0	1.5	V
Reverse Recovery Time	t _{RR}	I _S =84A, V _{GS} =0V, di/dt =100A/μs		43		ns
Reverse Recovery Charge	Q _{RR}			62		nC

Note: Pulsed

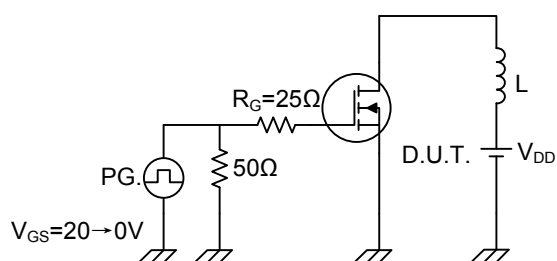
■ TEST CIRCUITS AND WAVEFORMS



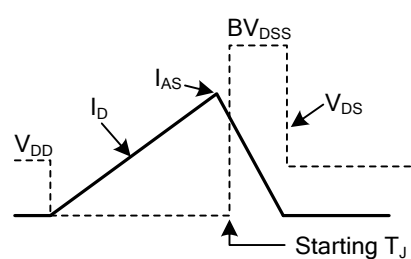
Switching Test Circuit



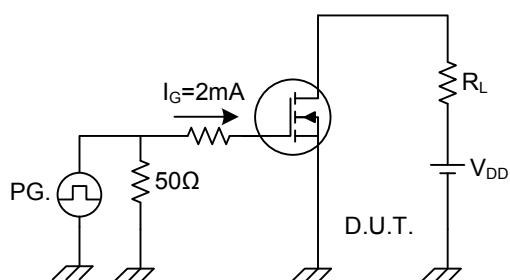
Switching Waveforms



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms



Gate Charge Test Circuit

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