



UNISONIC TECHNOLOGIES CO., LTD

UK2996

MOSFET

600V SILICON N-CHANNEL POWER MOSFET

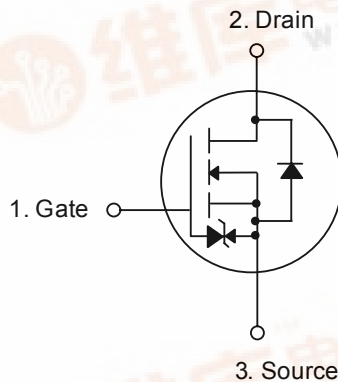
DESCRIPTION

The UK2996 is an N-channel enhancement mode field-effect power transistor. Intended for use in high voltage, high speed switching applications in power supplies, DC-DC converter, relay drive and PWM motor drive controls.

FEATURES

- * Fast switching times
- * Improved inductive ruggedness
- * High forward transfer admittance
- * Low on resistance
- * Low leakage current
- * Lower input capacitance

SYMBOL

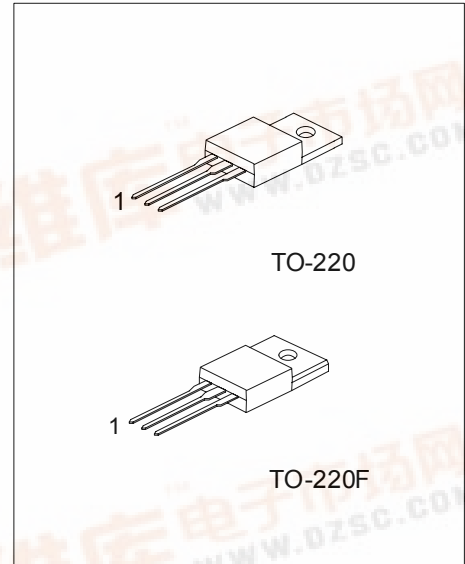


ORDERING INFORMATION

Order Number		Package	Pin Assignment			Packing
Normal	Lead Free Plating		1	2	3	
UK2996-TA3-T	UK2996L-TA3-T	TO-220	G	D	S	Tube
UK2996-TF3-T	UK2996L-TF3-T	TO-220F	G	D	S	Tube

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

UK2996L-TA3-T (1)Packing Type (2)Package Type (3)Lead Plating		(1) T: Tube (2) TA3: TO-220, TF3: TO-220F (3) L: Lead Free Plating Blank: Pb/Sn
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*Pb-free plating product number: UK2996L

■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	RATINGS	UNIT
Drain to Source Voltage	V_{DS}	600	V
Continuous Drain Current	I_D	10	A
Pulsed Drain Current	I_{DM}	30	A
Drain to Gate Voltage ($R_{GS} = 20\text{ k}\Omega$)	V_{DGR}	600	V
Gate to Source Voltage	V_{GSS}	± 30	V
Avalanche Current	I_{AR}	10	A
Single Pulsed Avalanche energy (Note 2)	E_{AS}	252	mJ
Repetitive Avalanche Energy (Note 3)	E_{AR}	4.5	mJ
Total Power Dissipation ($T_c = 25^\circ\text{C}$)	P_D	45	W
Operating Temperature Range	T_J	$-55 \sim +150$	
Storage Temperature	T_{STG}	$-55 \sim +150$	

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. $L = 4.41\text{ mH}$, $I_{AR} = 10\text{ A}$, $V_{DD} = 90\text{ V}$, $R_G = 25\text{ }\Omega$, starting $T_J = 25^\circ\text{C}$.

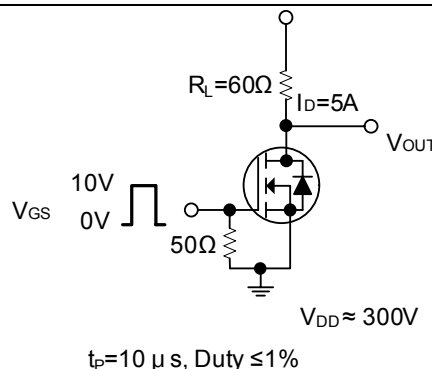
3. Pulse width and frequency is limited by T_J .

■ THERMAL DATA

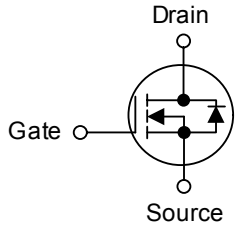
CHARACTERISTICS	SYMBOL	RATINGS	UNIT
Thermal Resistance, Channel to Ambient	θ_{JA}	62.5	/ W
Thermal Resistance, Channel to Case	θ_{JC}	2.78	/ W

■ ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

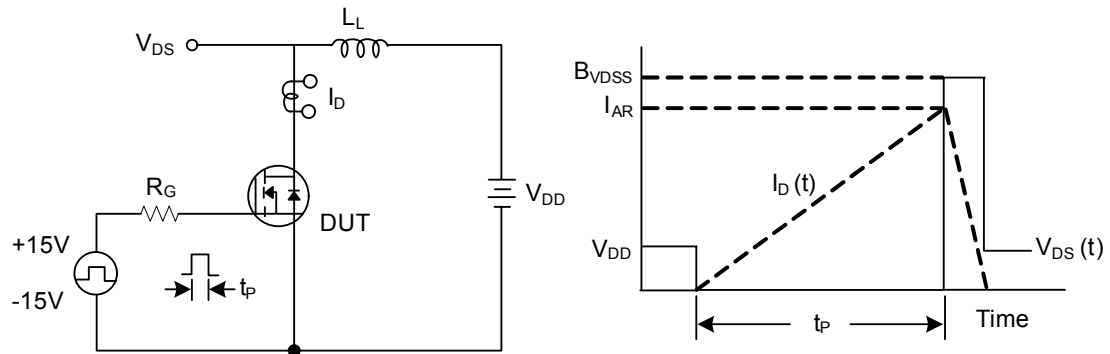
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Gate-Source Breakdown Voltage	BV_{GSS}	$V_{DS} = 0\text{ V}$, $I_G = \pm 10\text{ }\mu\text{A}$	± 30			V
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0\text{ V}$, $I_D = 10\text{ mA}$	600			V
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS} = 10\text{ V}$, $I_D = 1\text{ mA}$	2.0		4.0	V
Gate Source Leakage Current	I_{GSS}	$V_{GS} = \pm 25\text{ V}$, $V_{DS} = 0\text{ V}$			± 10	μA
Drain Source Leakage Current	I_{DSS}	$V_{DS} = 600\text{ V}$, $V_{GS} = 0\text{ V}$			100	μA
Static Drain-Source ON Resistance	$R_{DS(ON)}$	$V_{GS} = 10\text{ V}$, $I_D = 5\text{ A}$		0.74	1.0	Ω
Forward Transconductance	g_{FS}	$V_{DS} = 10\text{ V}$, $I_D = 5\text{ A}$	3.4	6.8		S
Input Capacitance	C_{ISS}	$V_{DS} = 20\text{ V}$, $V_{GS} = 0\text{ V}$, $f = 1\text{ MHz}$		1500		pF
Reverse Transfer Capacitance	C_{RSS}			13		
Output Capacitance	C_{OSS}			140		
Total Gate Charge	Q_G	$I_D = 10\text{ A}$, $V_{DD} \approx 400\text{ V}$, $V_{GS} = 10\text{ V}$		38		nC
Gate-Source Charge	Q_{GS}			21		
Gate-Drain Charge	Q_{GD}			17		
Switching Time	Turn-on Delay Time			55		ns
	Turn-on Rise Time			15		
	Turn-off Delay Time			145		
	Turn-off Fall Time			27		



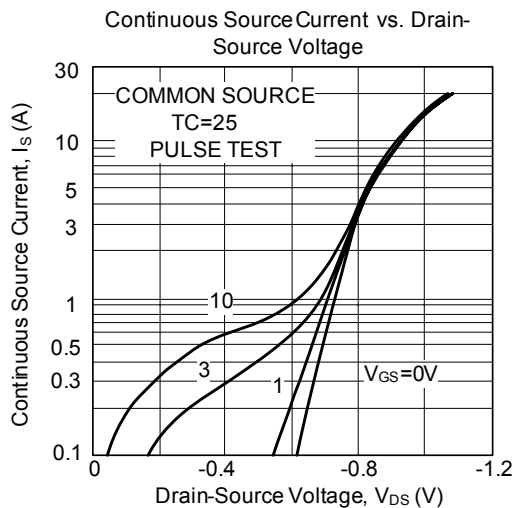
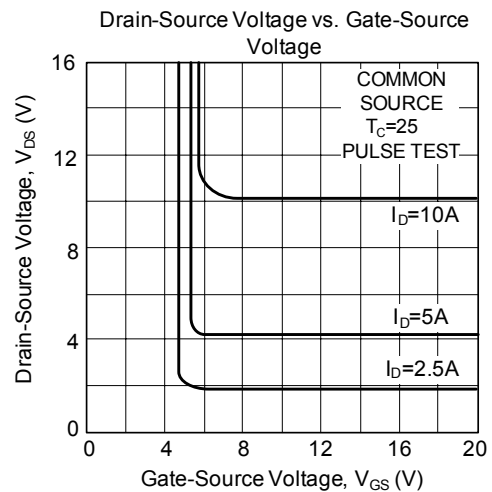
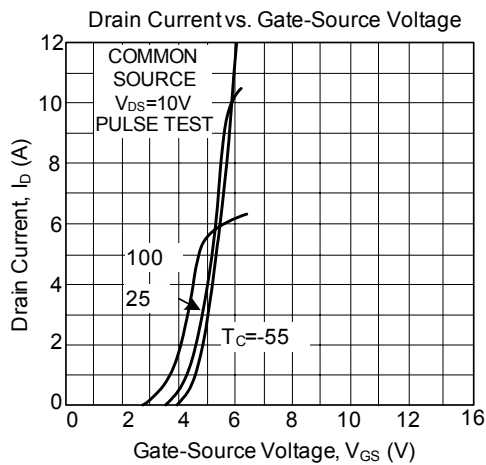
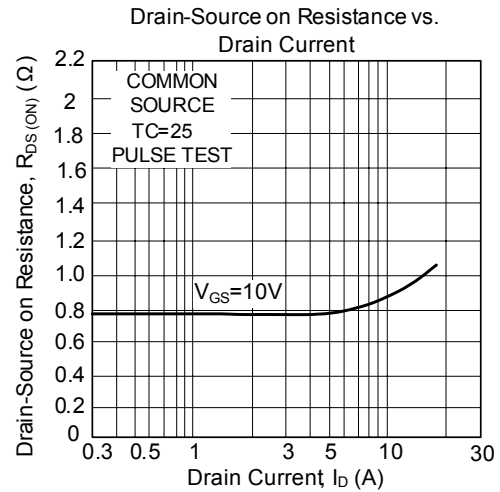
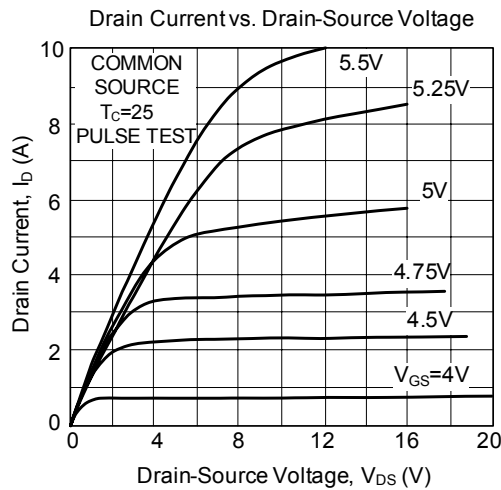
■ **SOURCE-DRAIN DIODE CHARACTERISTICS** ($T_a = 25^\circ\text{C}$)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Diode Forward Voltage	V_{SD}	$V_{GS} = 0\text{V}$, $I_S = 10\text{A}$			-1.7	V
Continuous Source Current (body diode)	I_S	Integral Reverse p-n Junction Diode in the MOSFET			10	A
Pulse Source Current (body diode)	I_{SM}				30	A
Reverse Recovery Time	t_{RR}	$V_{GS} = 0\text{V}$, $I_S = 10\text{A}$,		1600		ns
Reverse Recovery Charge	Q_{RR}	$dI_F/dt = 100\text{ A}/\mu\text{s}$		17		μC

■ TEST CIRCUIT AND WAVE FORM



TYPICAL CHARACTERISTICS



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