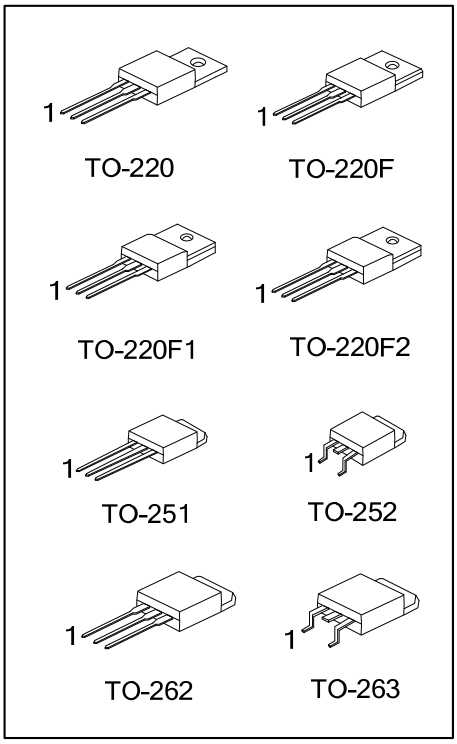
UF9Z24

Power MOSFET

12A, 55V P-CHANNEL POWER MOSFET



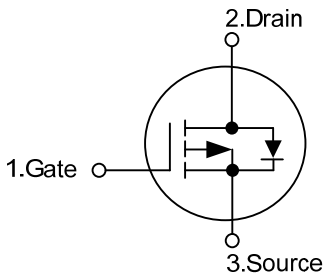
■ DESCRIPTION

The UTC **UF9Z24** is a P-channel power MOSFET using UTC's advanced technology to provide the customers with high switching speed, cost-effectiveness and minimum on-state resistance. It can also withstand high energy in the avalanche.

■ FEATURES

* $R_{DS(ON)} \leq 0.175\ \Omega$ @ V_{GS}= -10V, I_D= -12A
* High Switching Speed

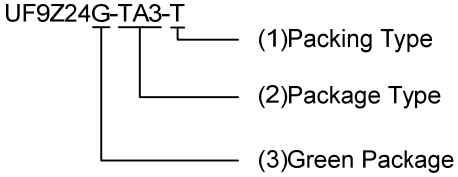
■ SYMBOL



■ ORDERING INFORMATION

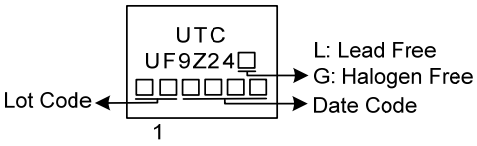
Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UF9Z24L-TA3-T	UF9Z24G-TA3-T	TO-220	G	D	S	Tube
UF9Z24L-TF3-T	UF9Z24G-TF3-T	TO-220F	G	D	S	Tube
UF9Z24L-TF1-T	UF9Z24G-TF1-T	TO-220F1	G	D	S	Tube
UF9Z24L-TF2-T	UF9Z24G-TF2-T	TO-220F2	G	D	S	Tube
UF9Z24L-TM3-T	UF9Z24G-TM3-T	TO-251	G	D	S	Tube
UF9Z24L-TN3-R	UF9Z24G-TN3-R	TO-252	G	D	S	Tape Reel
UF9Z24L-T2Q-T	UF9Z24G-T2Q-T	TO-262	G	D	S	Tube
UF9Z24L-T2Q-R	UF9Z24G-T2Q-R	TO-262	G	D	S	Tape Reel
UF9Z24L-TQ2-T	UF9Z24G-TQ2-T	TO-263	G	D	S	Tube
UF9Z24L-TQ2-R	UF9Z24G-TQ2-R	TO-263	G	D	S	Tape Reel

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



(1) T: Tube, R: Tape Reel
(2) TA3: TO-220, TF1: TO-220F1, TF2: TO-220F2
TF3: TO-220F, TM3: TO-251, TN3: TO-252
T2Q: TO-262, TQ2: TO-263
(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



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

PARAMETER			SYMBOL	RATINGS	UNIT
Drain-Source Voltage			V_{DSS}	-55	V
Gate-Source Voltage			V_{GSS}	±20	V
Drain Current	Continuous	T_C=25°C	I_D	-12	A
	Pulsed		I_{DM}	-48	A
Single Pulsed Avalanche Current (L=3.7mH)			I_{AS}	-7.2	A
Single Pulsed Avalanche Energy (L=3.7mH)(Note 1)			E_{AS}	96	mJ
Power Dissipation	TO-220/TO-262/TO-263		P_D	38	W
	TO-220F/TO-220F1			23	W
	TO-220F2			25	W
	TO-251/TO-252			27	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. Repetitive Rating: Pulse width limited by maximum junction temperature.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220/TO-220F TO-220F1/TO-220F2 TO-262/TO-263	θ_{JA}	62	°C/W
	TO-251/TO-252		110	°C/W
Junction to Case	TO-220/TO-262/TO-263	θ_{JC}	3.3	°C/W
	TO-220F/TO-220F1		5.5	°C/W
	TO-220F2		5	°C/W
	TO-251/TO-252		4.6 (Note 1)	°C/W

Notes: 1. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.
2. Duty cycle ≤ 1 %.

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

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	I_D=-250μA, V_{GS}=0V	-55			V
Drain-Source Leakage Current		I_{DSS}	V_{DS}=-55V, V_{GS}=0V			-25	μA
Gate-Source Leakage Current	Forward	I_{GSS}	V_{GS}=+20V			+100	nA
	Reverse		V_{GS}=-20V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=-250μA	-2.0		-4.0	V
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	V_{GS}=-10V, I_D=-12A (Note 1)			0.175	Ω
On State Drain Current (Note 1)		$I_{D(ON)}$	V_{GS}=-10V, V_{DS}=-5.0V	-12			A
DYNAMIC PARAMETERS (Note 2)							
Input Capacitance		C_{ISS}	V_{GS}=0V, V_{DS}=-25V, f=1.0MHz (Note 2)		636		pF
Output Capacitance		C_{OSS}			175		pF
Reverse Transfer Capacitance		C_{RSS}			34		pF
SWITCHING PARAMETERS							
Total Gate Charge		Q_G	V_{GS}=-10V, V_{DS}=-44V, I_D=-7.2A (Note 1,2,3)		10		nC
Gate to Source Charge		Q_{GS}			3.4		nC
Gate to Drain Charge		Q_{GD}			1.9		nC
Turn-ON Delay Time		$t_{D(ON)}$	V_{DD}=-28V, I_D=-7.2A, R_G=24Ω R_D=3.7Ω ,V_{GS}=-10V (Note 1,2,3)		10		ns
Rise Time		t_R			25		ns
Turn-OFF Delay Time		$t_{D(OFF)}$			52		ns
Fall-Time		t_F			26		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS (Note 2)							
Maximum Body-Diode Continuous Current		I_S				-12	A
Maximum Body-Diode Pulsed Current		I_{SM}				-48	A
Drain-Source Diode Forward Voltage		V_{SD}	I_F=-12A, V_{GS}=0V (Note 1)			-1.6	V

Notes: 1. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2 %.
2. Guaranteed by design, not subject to production testing.
3. Independent of operating temperature.

■ TYPICAL CHARACTERISTICS