

UTC UNISONIC TECHNOLOGIES CO., LTD

UF640 MOSFET

18 A, 200 V, 0.18 OHM, N-CHANNEL POWER MOSFET

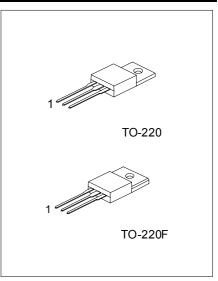
DESCRIPTION

These kinds of n-channel power mos field effect transistor have low conduction power loss, high input impedance, and high switching speed, Linear Transfer Characteristics, so can be use in a variety of power conversion applications.

The UF640 suitable for resonant and PWM converter topologies.

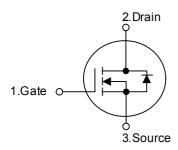
FEATURES

- * $R_{DS(ON)} = 0.18\Omega@V_{GS} = 10V$.
- * Ultra Low gate charge (typical 43nC)
- * Low reverse transfer capacitance (C_{RSS} = typical 100 pF)
- * Fast switching capability
- * Avalanche energy specified
- * Improved dv/dt capability, high ruggedness



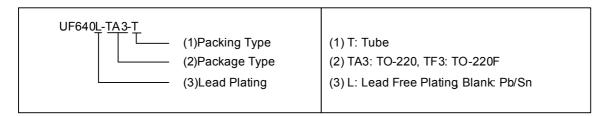
*Pb-free plating product number: UF640L

SYMBOL



ORDERING INFORMATION

Order Number		Dookogo	Pin Assignment			Dooking	
Normal	Lead Free Plating	- Package	1	2	3	Packing	
UF640-TA3-T	UF640L-TA3-T	TO-220	G	D	S	Tube	
UF640-TF3-T	UF640L-TF3-T	TO-220F	G	D	S	Tube	



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■ ABSOLUTE MAXIMUM RATING (T_C = 25 , unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT	
Drain-Source Voltage	V_{DSS}	200	V	
Drain-Gate Voltage (R _{GS} = 20kΩ)	V_{DGR}	200	V	
Gate-Source Voltage	V_{GSS}	±20	V	
Continuous Drain Current	$T_{\rm C} = 25$		18	Α
Continuous Drain Current	$T_{\rm C} = 100$	I _D	11	Α
Pulsed Drain Current (Note 2)	I _{DM}	72	Α	
Single Pulse Avalanche Energy Rating (Note	E _{AS}	580	mJ	
Maximum Power Dissipation		Ь	125	W
Dissipation Derating Factor		$ P_{D}$	1.0	W/
Junction Temperature	Τ _J	+150		
Storage Temperature	T_{STG}	-55 ~ + 150		

Note 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.

■ THERMAL DATA

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Thermal Resistance, Channel to Ambient	θ_{JA}			62	°C/W
Thermal Resistance, Channel to Case	θЈС			1	°C/W

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Drain-Source Breakdown Voltage	BV _{DSS}	$I_D = 250 \mu A, V_{GS} = 0 V$	200			V
Gate Threshold Voltage	$V_{GS(THR)}$	$V_{GS} = V_{DS}, I_D = 250 \mu A$	2		4	V
		V _{DS} = Rated BV _{DSS} , V _{GS} = 0V			25	μΑ
Drain-Source Leakage Current	I _{DSS}	$V_{DS} = 0.8 \text{ x Rated BV}_{DSS}, V_{GS} = 0V,$			250	
		T _J = 125			250	μA
On-State Drain Current	$I_{D(ON)}$	$V_{DS} > I_{D(ON)} x R_{DS(ON)} MAX, V_{GS} = 10V$	18			Α
Gate-Source Leakage Current	I _{GSS}	$V_{GS} = \pm 20V$			±100	nA
Drain-Source On Resistance	R _{DS(ON)}	I _D = 10A, V _{GS} = 10V		0.14	0.18	Ω
Forward Transconductance	g FS	$V_{DS} \ge 10V, I_{D} = 11A$	6.7	10		S
Input Capacitance	C _{ISS}			1275		pF
Output Capacitance	Coss	$V_{DS} = 25V, V_{GS} = 0V, f = 1MHz$		400		pF
Reverse Transfer Capacitance	C _{RSS}			100		pF
Total Gate Charge	_	$V_{GS} = 10V, I_D \approx 18A, V_{DS} = 0.8 x$		43	64	nC
(Gate to Source + Gate to Drain)	$Q_{G(TOT)}$	Rated BV _{DSS} Gate Charge is		40	04	IIC
Gate-Source Charge	Q_GS	Essentially Independent of		8		nC
Gate-Drain "Miller" Charge	Q_{GD}	Operating Temperature $I_{G(REF)}$ =		22		nC
Gate-Brain Willer Gharge		1.5mA		22		110
Turn-On Delay Time	t _{D(ON)}	$V_{DD} = 100V, I_D \approx 18A, R_{GS} = 9.1\Omega,$		13	21	ns
Rise Time	t_R	$R_L = 5.4\Omega$,		50	77	ns
Turn-Off Delay Time	t _{D(OFF)}	MOSFET Switching Times are		46	68	ns
 Fall Time	t _F	Essentially Independent of		35	54	ns
I all Tillic	나	Operating Temperature		55	J4	113

■ ELECTRICAL CHARACTERISTICS(Cont.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
	L _D	Measured				
		From the				
		Contact Screw		3.5		nΗ
		on Tab to				
		Center of Die Modified MOSFET Symbol				
Internal Drain Inductance		Measured Showing the Internal				
		From the Drain Devices Inductances				
		Lead, 6mm		4.5		nН
		(0.25in) From		4.5		
		Package to ELD				
		Center of Die				
		Measured Go Go				
		From the				
	Ls	Source Lead,				
Internal Source Inductance		6mm (0.25in)		7.5		nΗ
		from Header to				
		Source				
		Bonding Pad				
SOURCE TO DRAIN DIODE SPECIF	CATIONS	3				
Diode Forward Voltage (Note 1)	V_{SD}	$T_J = 25$, $I_S = 18A$, $V_{GS} = 0V$,			2.0	V
Continuous Source Current (body	Is	Integral Reverse p-n Junction			18	Α
diode)	ıs	Diode in the MOSFET			10	
		Drain				
		Y				
Pulse Source Current (body diode)		(1			72	Α
(Note 1)	I _{SM}	Gateo			12	A
		_				
		Sourse				
Reverse Recovery Time	t _{RR}	$T_J = 25$, $I_S = 18A$,	120	240	530	ns
Teverse recovery fine		dl _S /dt = 100A/μs	120	2-0	555	113
Reverse Recovery Charge	Q_{RR}	$T_J = 25$, $I_S = 18A$,	1.3	2.8	5.6	μC
Travalus recovery onlinge	≪ KK	$dI_S/dt = 100A/\mu s$		2.0	0.0	μΟ

Note 1. Pulse Test: Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

^{2.} Repetitive Rating: Pulse width limited by maximum junction temperature. See Transient Thermal Impedance curve.

^{3.} L = 3.37mH, V_{DD} = 50V, R_G = 25 Ω , peak I_{AS} = 18A, starting T_J = 25 .

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■ TEST CIRCUIT

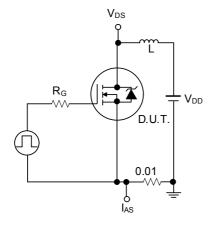


Figure 1A. Unclamped Energy Test Circuit

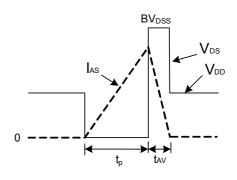


Figure 1B. Unclamped Energy Waveforms

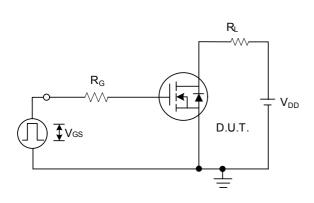


Figure 2A. Switching Time Test Circuit

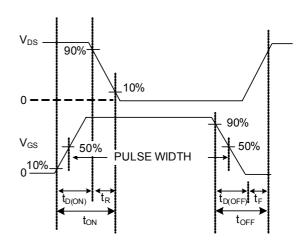


Figure 2B. Resistive Switching Waveforms

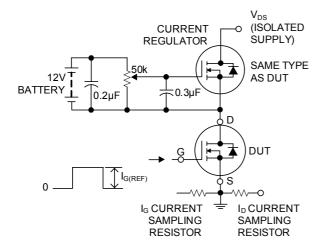


Figure 3A. Gate Charge Test Circuit

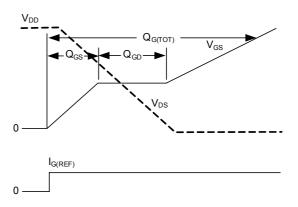
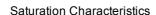
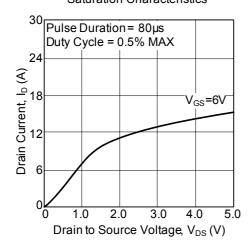


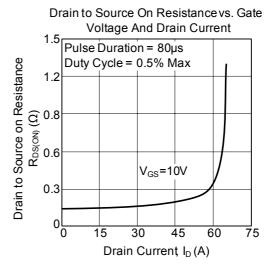
Figure 3B. Gate Charge Waveforms

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TYPICAL CHARACTERISTICS







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