



UF640V

Power MOSFET

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

DESCRIPTION

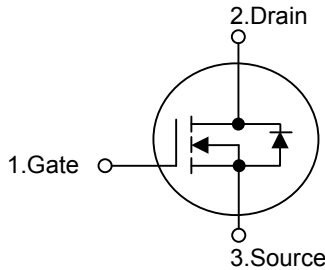
These kinds of n-channel power MOSFET field effect transistor have low conduction power loss, high input impedance, and high switching speed, Linear Transfer Characteristics, so can be use in a variety of power conversion applications.

The **UF640V** suitable for resonant and PWM converter topologies.

FEATURES

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

SYMBOL

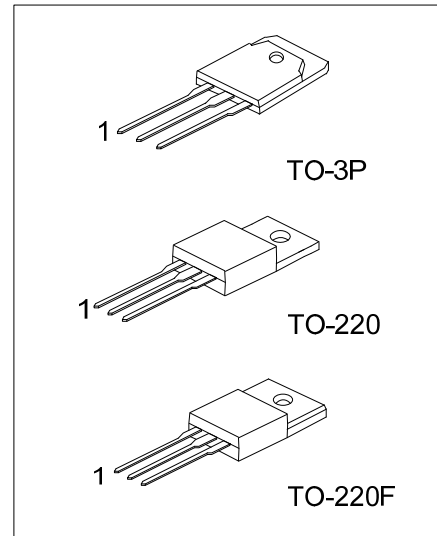


ORDERING INFORMATION

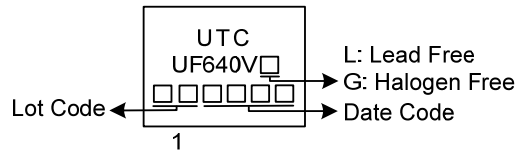
Ordering Number		Package	Pin Assignment			Packing
Lead Free Plating	Halogen Free		1	2	3	
UF640VL-TA3-T	UF640VG-TA3-T	TO-220	G	D	S	Tube
UF640VL-TF3-T	UF640VG-TF3-T	TO-220F	G	D	S	Tube
UF640VL-T3P-T	UF640VG-T3P-T	TO-3P	G	D	S	Tube

Note: Pin Assignment: B: Base C: Collector E: Emitter

<p>UF640VG-TA3-T</p> <p>(1)Packing Type</p> <p>(2)Package Type</p> <p>(3)Green Package</p>	<p>(1) T: Tube</p> <p>(2) TA3: TO-220, TF3: TO-220F, T3P: TO-3P</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
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■ MARKING



■ ABSOLUTE MAXIMUM RATING ($T_C = 25^\circ\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	200	V
Drain-Gate Voltage ($R_{GS}=20\text{k}\Omega$)		V_{DGR}	200	V
Gate-Source Voltage		V_{GSS}	± 20	V
Continuous Drain Current		I_D	18	A
Pulsed Drain Current (Note 3)		I_{DM}	72	A
Single Pulse Avalanche Energy Rating (Note 3)		E_{AS}	216	mJ
Peak Diode Recovery dv/dt		dv/dt	5.5	V/ns
Maximum Power Dissipation	TO-3P	P_D	150	W
	TO-220		123	W
	TO-220F		40	W
Junction Temperature		T_J	+150	$^\circ\text{C}$
Storage Temperature		T_{STG}	-55 ~ +150	$^\circ\text{C}$

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.

3. $L = 1.8\text{mH}$, $I_{AS} = 15.5\text{A}$, $V_{DD} = 50\text{V}$, $R_G = 25\Omega$, Starting $T_J = 25^\circ\text{C}$

4. $I_{SD} \leq 18\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, Starting $T_J = 25^\circ\text{C}$

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-3P	θ_{JA}	50	$^\circ\text{C}/\text{W}$
	TO-220		62.5	
	TO-220F			
Junction to Case	TO-3P	θ_{JC}	0.833	$^\circ\text{C}/\text{W}$
	TO-220		1.01	
	TO-220F		3.1	

■ 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	200			V	
Drain-Source Leakage Current	I _{DSS}	V _{DS} =200V, V _{GS} =0V			25	μA	
Gate- Source Leakage Current	Forward	I _{GSS}			+100	nA	
	Reverse				-100	nA	
ON CHARACTERISTICS							
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250μA	1.0		2.5	V	
Static Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =10A			0.18	Ω	
DYNAMIC PARAMETERS							
Input Capacitance	C _{ISS}	V _{GS} =0V, V _{DS} =25V, f=1.0MHz		1120		pF	
Output Capacitance	C _{OSS}				190		pF
Reverse Transfer Capacitance	C _{RSS}				20		pF
SWITCHING PARAMETERS							
Total Gate Charge	Q _G	V _{DS} =160V, V _{GS} =10V, I _D =16A I _G = 1mA (Note1, 2)		33		nC	
Gate to Source Charge	Q _{GS}				8		nC
Gate to Drain Charge	Q _{GD}				6		nC
Turn-ON Delay Time	t _{D(ON)}	V _{DD} =100V, V _{GS} =10V, I _D =16A, R _G =25Ω (Note1, 2)		5.6		ns	
Rise Time	t _R				20		ns
Turn-OFF Delay Time	t _{D(OFF)}				124		ns
Fall-Time	t _F				34		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current	I _S				18	A	
Maximum Body-Diode Pulsed Current	I _{SM}				72	A	
Drain-Source Diode Forward Voltage	V _{SD}	I _S =18A, V _{GS} =0V			2	V	
Body Diode Reverse Recovery Time	t _{rr}	I _S =18A, V _{GS} =0V, dI _F /dt=100A/μs (Note 1)		180		ns	
Body Diode Reverse Recovery Charge	Q _{rr}				1.1		μC

Notes: 1. Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2%.

2. Essentially independent of operating ambient temperature.

■ TEST CIRCUIT

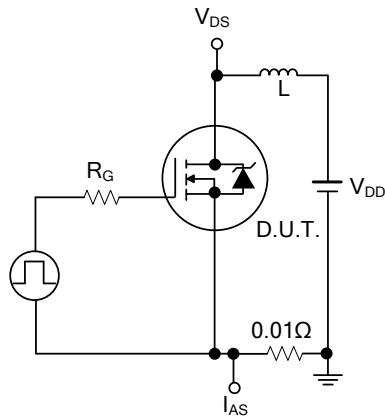


Fig. 1 Unclamped Energy Test Circuit

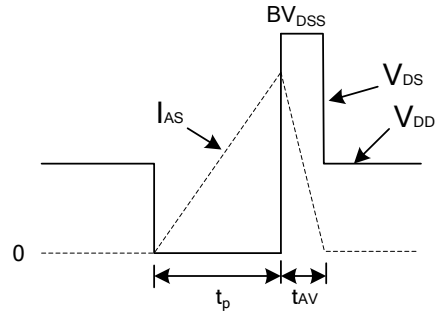


Fig.2 Unclamped Energy Waveforms

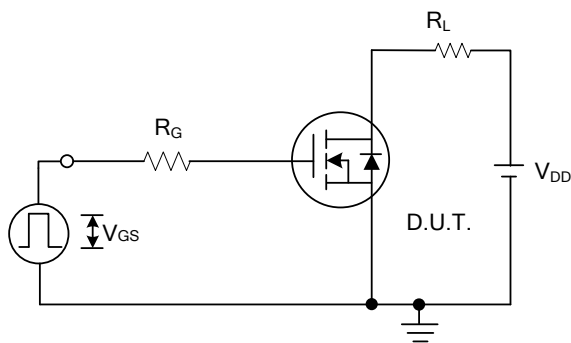


Fig.3 Switching Time Test Circuit

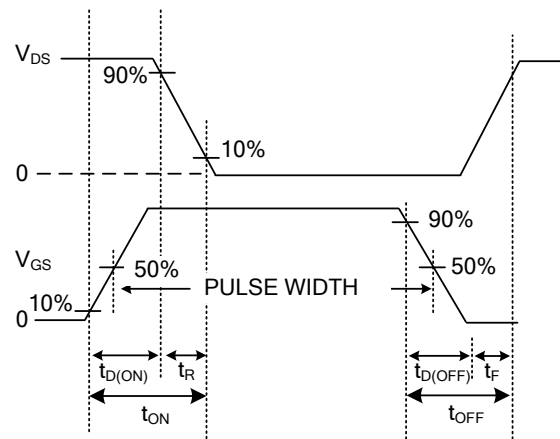


Fig.4 Resistive Switching Waveforms

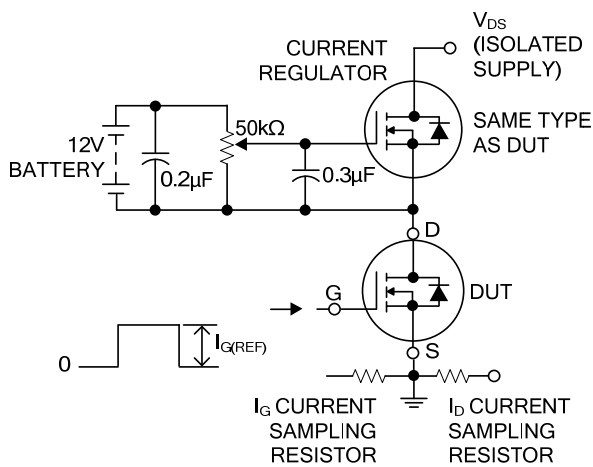


Fig.5 Gate Charge Test Circuit

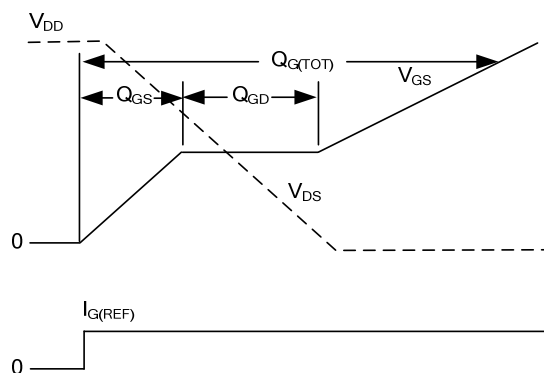
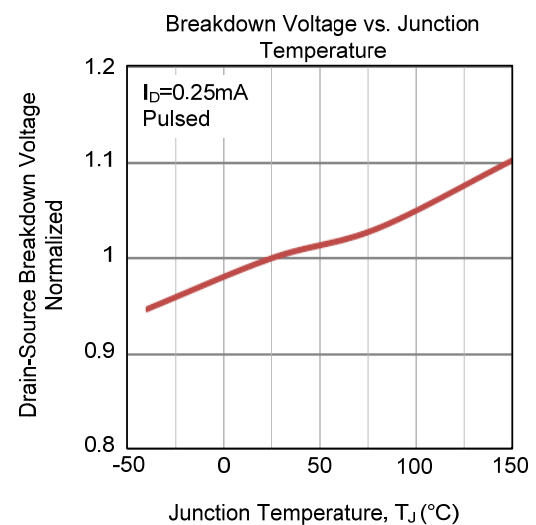
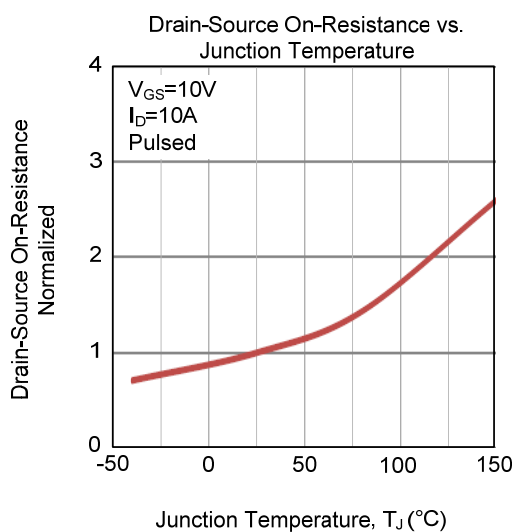
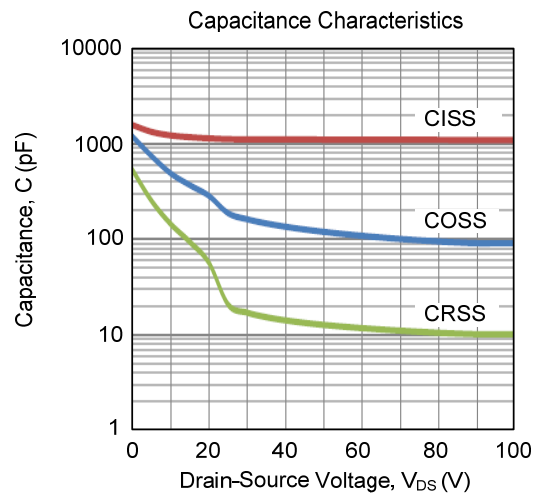
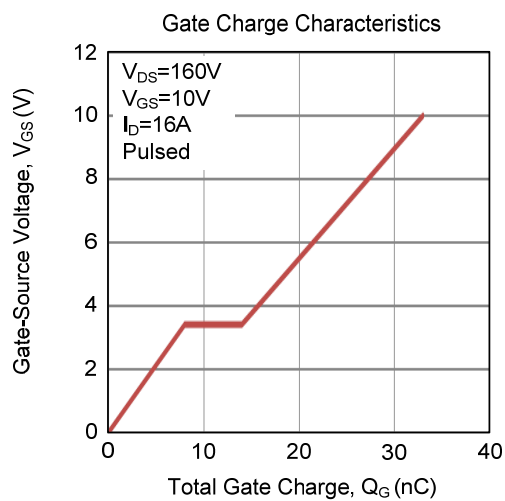
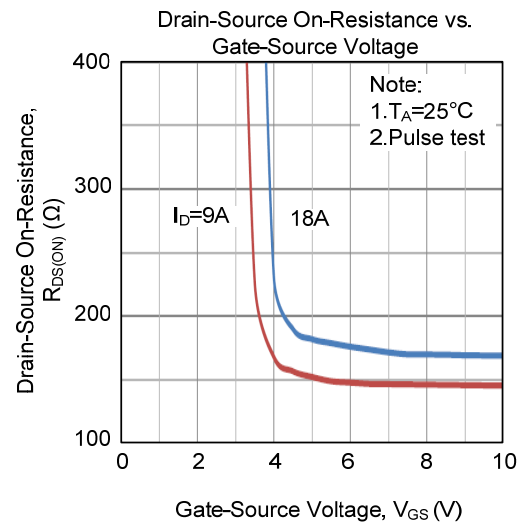
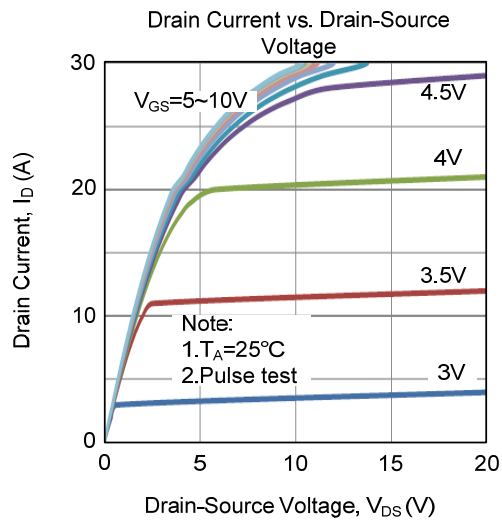
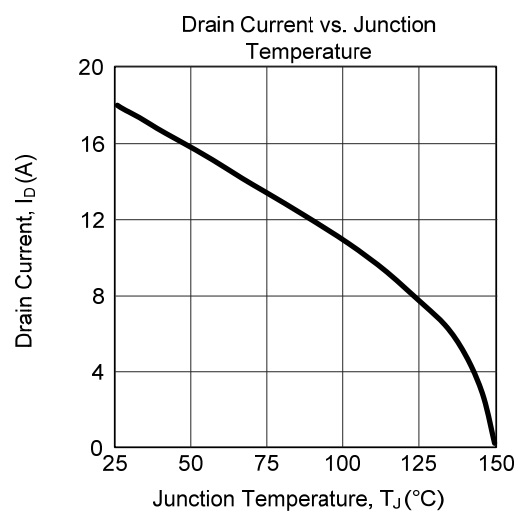
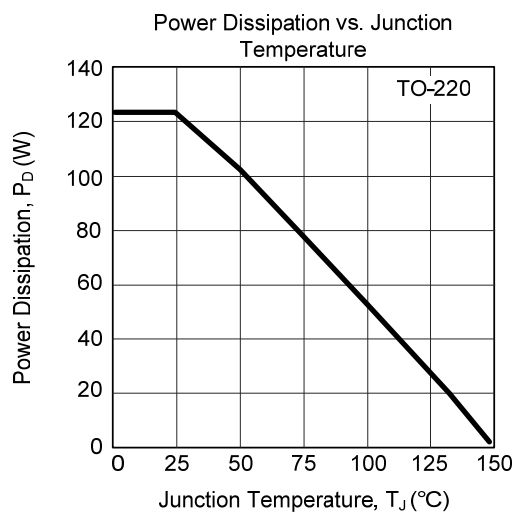
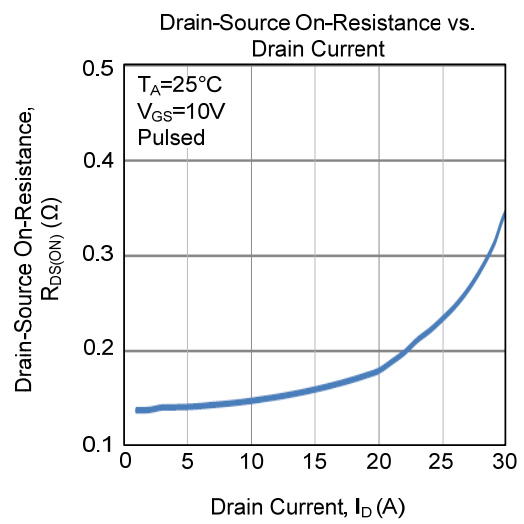
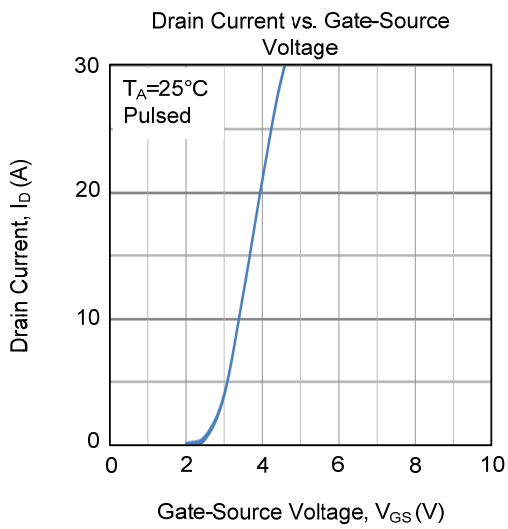
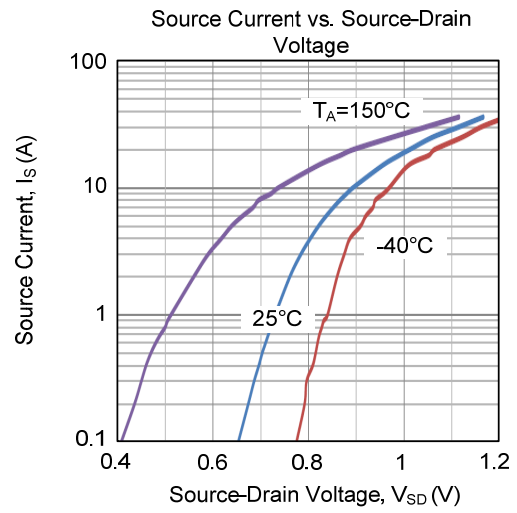
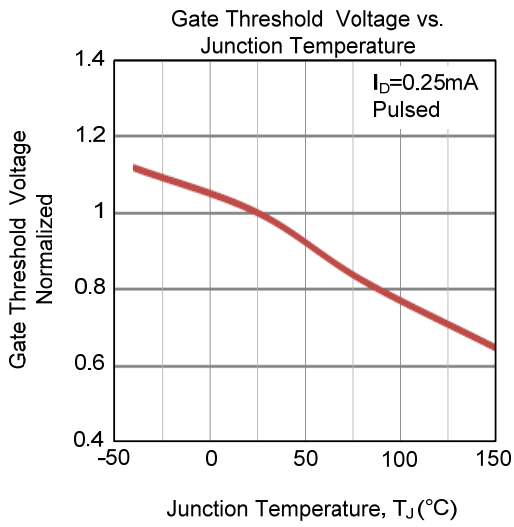


Fig.6 Gate Charge Waveforms

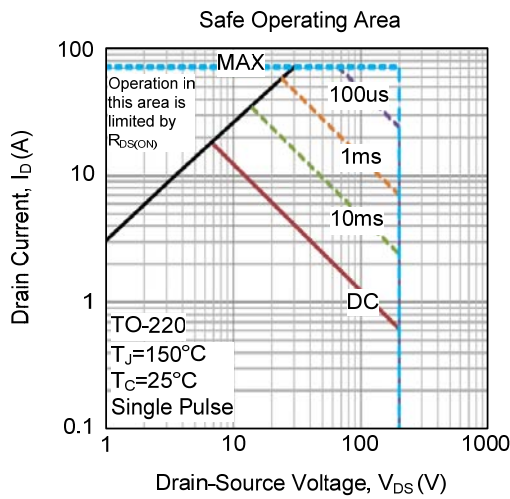
■ TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



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