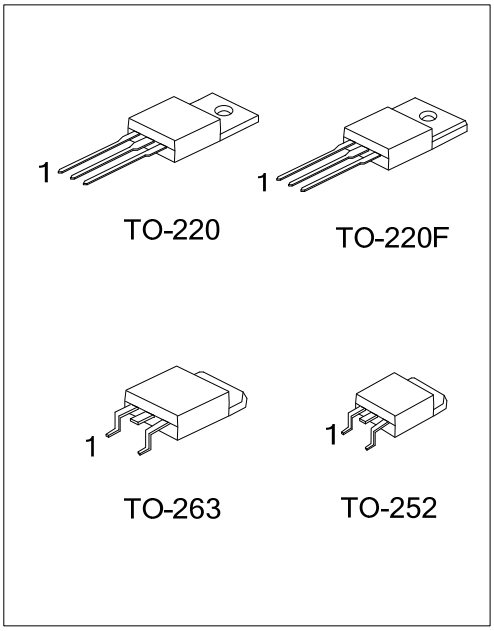
UF540

Power MOSFET

27A, 100V N-CHANNEL POWER MOSFET



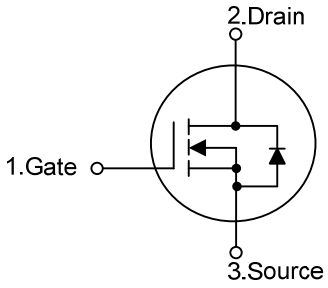
■ DESCRIPTION

The UTC **UF540** is a N-channel enhancement mode power MOSFET using UTC's advanced technology to provide the customers with a minimum on-state resistance and high switching speed.

■ FEATURES

* $R_{DS(on)}$ ≤ 36 mΩ @ V_{GS}=10V, I_D=15A
* High Switching Speed

■ SYMBOL



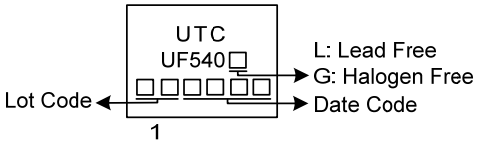
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UF540L-TA3-T	UF540G-TA3-T	TO-220	G	D	S	Tube
UF540L-TF3-T	UF540G-TF3-T	TO-220F	G	D	S	Tube
UF540L-TN3-R	UF540G-TN3-R	TO-252	G	D	S	Tape Reel
UF540L-TQ2-T	UF540G-TQ2-T	TO-263	G	D	S	Tube
UF540L-TQ2-R	UF540G-TQ2-R	TO-263	G	D	S	Tape Reel

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

UF540G-TA3-T (1)Packing Type (2)Package Type (3)Green Package	(1) T: Tube, R: Tape Reel (2) TA3: TO-220, TF3: TO-220F, TN3: TO-252 (3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



■ ABSOLUTE MAXIMUM RATINGS

PARAMETER			SYMBOL	RATINGS	UNIT
Drain-Source Voltage (Note 2)			V_{DSS}	100	V
Gate-Source Voltage			V_{GSS}	±20	V
Drain Current	Continuous	T_C=25°C	I_D	27	A
		T_C=100°C		17	A
	Pulsed (Note 3)		I_{DM}	108	A
Avalanche Energy	Single Pulsed (Note 4)		E_{AS}	337	mJ
Power Dissipation (T_C=25°C)		TO-220 TO-263	P_D	125	W
		TO-220F		40	W
		TO-252		55	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.
3. L=1.5mH, I_{AS}=21.2A, V_{DD}=50V, R_G=25Ω, Starting T_J=25°C.
4. I_{SD} ≤ 7.0A, di/dt ≤200A/μs, V_{DD} ≤ BV_{DSS}, Starting T_J=25°C.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Case	TO-220 TO-263	θ_{JC}	1.0	°C/W
	TO-220F		3.125	°C/W
	TO-252		2.27	°C/W

Note: Device mounted on FR-4 substrate P_C board, 2oz copper, with 1inch square copper plate.

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

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	I_D=250μA, V_{GS}=0V	100			V
Drain-Source Leakage Current		I_{DSS}	V_{DS}=100V, V_{GS}=0V			1	μA
Gate-Source Leakage Current	Forward	I_{GSS}	V_{GS}=+20V, V_{DS}=0V			100	nA
	Reverse		V_{GS}=-20V, V_{DS}=0V			-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=15A			36	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	V_{GS}=0V, V_{DS}=25V, f=1.0MHz		1620		pF
Output Capacitance		C_{OSS}			280		pF
Reverse Transfer Capacitance		C_{RSS}			48		pF
SWITCHING PARAMETERS							
Total Gate Charge		Q_G	V_{DD}=80V, V_{GS}=10V, I_D=27A		46		nC
Gate to Source Charge		Q_{GS}			14		nC
Gate to Drain Charge		Q_{GD}			16		nC
Turn-ON Delay Time		$t_{D(ON)}$	V_{DD}=50V, V_{GS}=10V, I_D=27A, R_G=25Ω (Fig.1, 2) (Note 2)		22		ns
Rise Time		t_R			32		ns
Turn-OFF Delay Time		$t_{D(OFF)}$			105		ns
Fall-Time		t_F			30		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I_S				27	A
Maximum Body-Diode Pulsed Current		I_{SM}				108	A
Drain-Source Diode Forward Voltage		V_{SD}	I_S=27A, V_{GS}=0V			1.4	V
Body Diode Reverse Recovery Time		t_{rr}	I_S=18A, V_{GS}=0V, dI_F/dt=100A/μs (Note 1)		92		ns
Reverse Recovery Charge		Q_{rr}			0.3		μC

Notes: 1. Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2%.
2. Essentially independent of operating ambient temperature.

■ TEST CIRCUITS AND WAVEFORMS

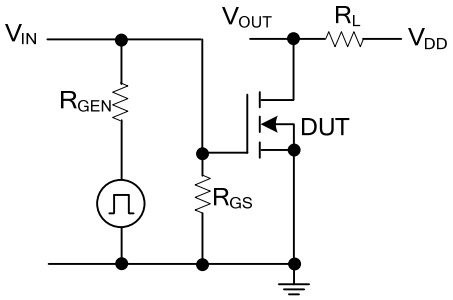


Fig.1 Switching Test Circuit

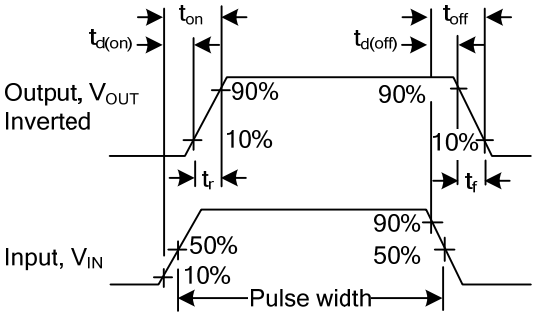
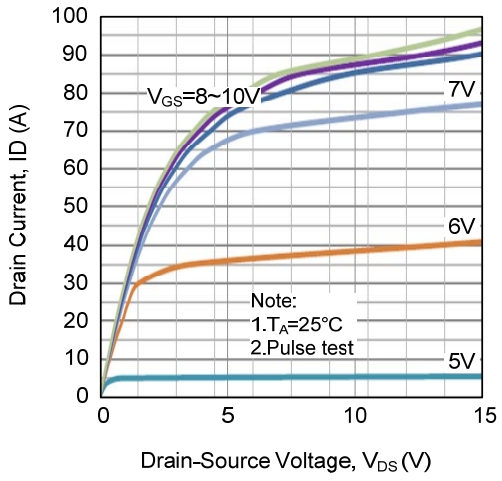


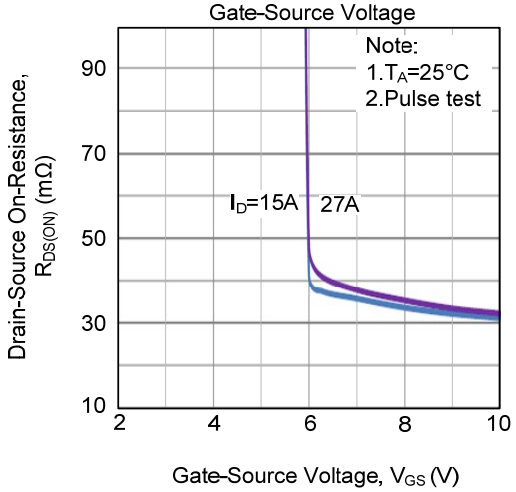
Fig.2 Switching Waveforms

■ TYPICAL CHARACTERISTICS

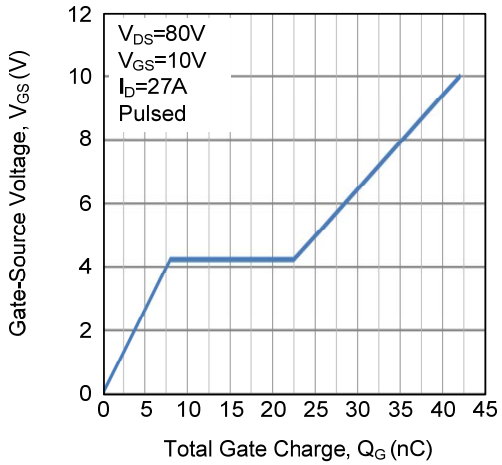
Drain Current vs. Drain-Source Voltage



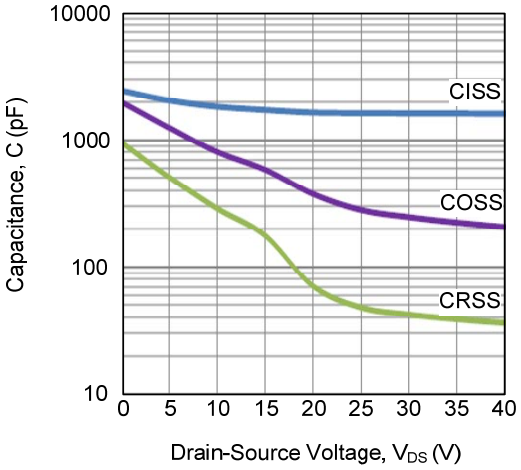
Drain-Source On-Resistance vs. Gate-Source Voltage



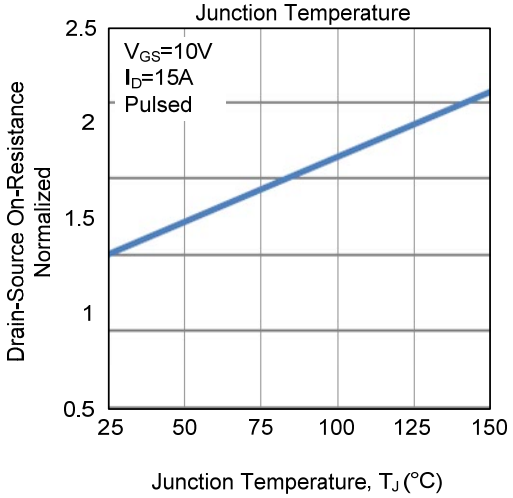
Gate Charge Characteristics



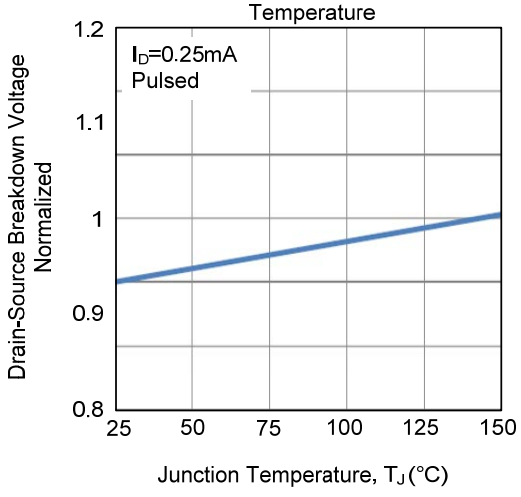
Capacitance Characteristics



Drain-Source On-Resistance vs. Junction Temperature

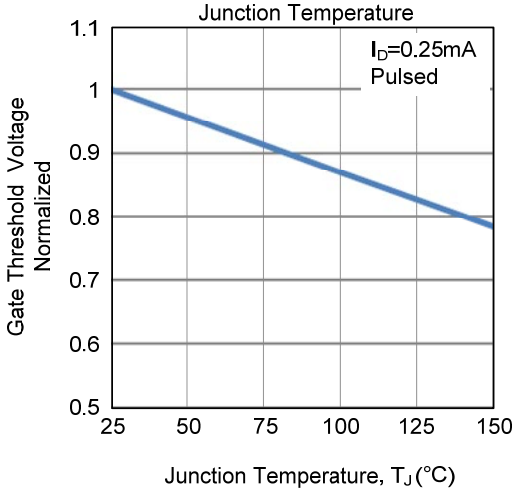


Breakdown Voltage vs. Junction Temperature

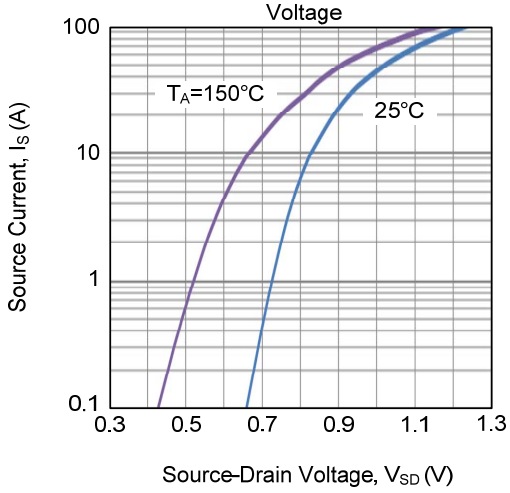


■ TYPICAL CHARACTERISTICS (Cont.)

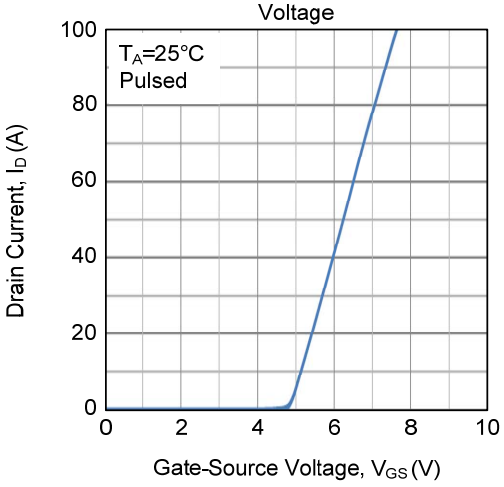
Gate Threshold Voltage vs. Junction Temperature



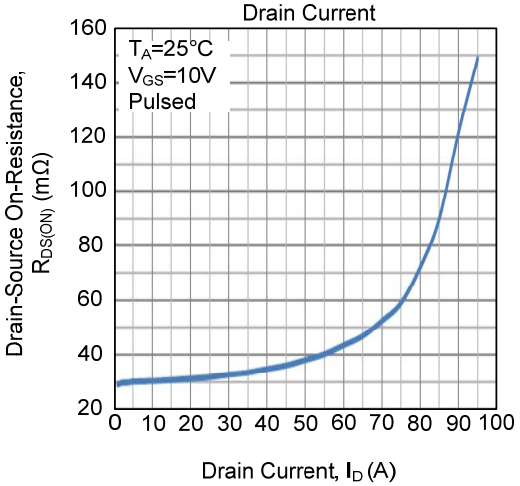
Source Current vs. Source-Drain Voltage



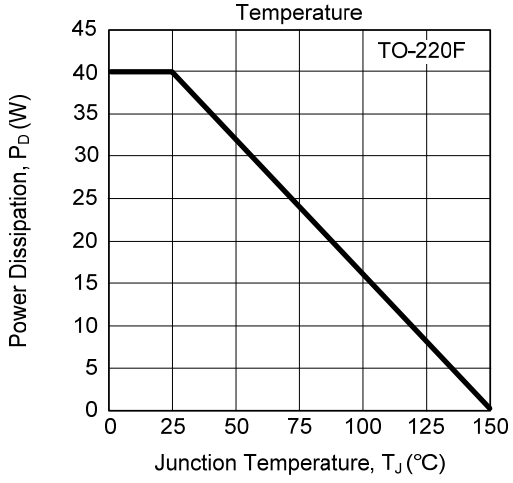
Drain Current vs. Gate-Source Voltage



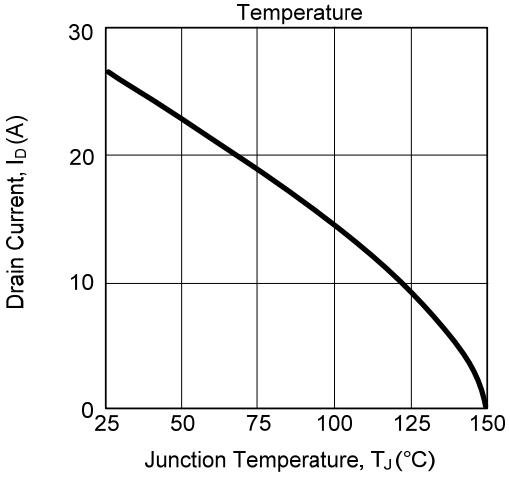
Drain-Source On-Resistance vs. Drain Current



Power Dissipation vs. Junction Temperature



Drain Current vs. Junction Temperature



■ TYPICAL CHARACTERISTICS (Cont.)