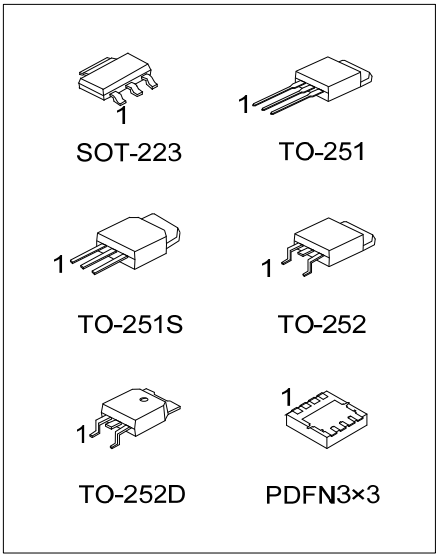
UF3N25Z

Power MOSFET

3.0A, 250V N-CHANNEL POWER MOSFET



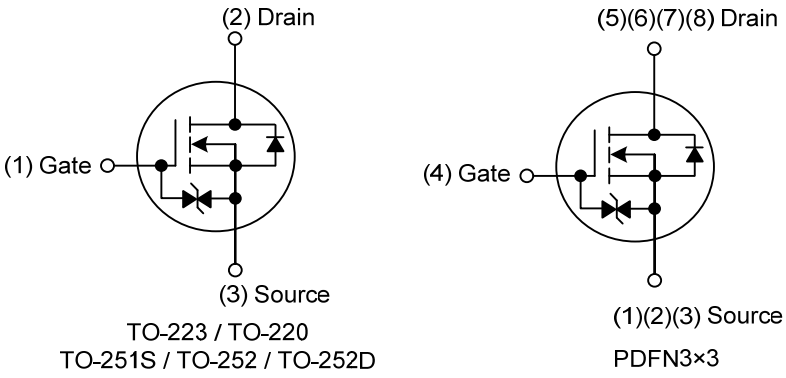
■ DESCRIPTION

The UTC **UF3N25Z** is an N-channel enhancement mode Power MOSFET using UTC' s advanced technology to provide customers with a minimum on-state resistance, low gate charge and superior switching performance.

■ FEATURES

* $R_{DS(ON)}$ ≤ 2.0 Ω @ V_{GS}=10V, I_D=3.0A
* High switching speed
* Typically 3.2nC low gate charge
* 100% avalanche tested

■ SYMBOL



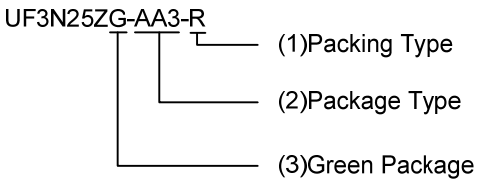
TO-223 / TO-220
TO-251S / TO-252 / TO-252D

PDFN3×3

■ ORDERING INFORMATION

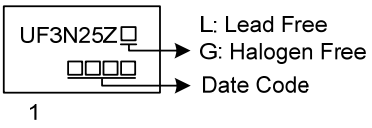
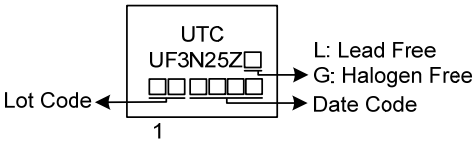
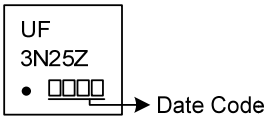
Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UF3N25ZL-AA3-R	UF3N25ZG-AA3-R	SOT-223	G	D	S	-	-	-	-	-	Tape Reel
UF3N25ZL-TM3-T	UF3N25ZG-TM3-T	TO-251	G	D	S	-	-	-	-	-	Tube
UF3N25ZL-TMS-T	UF3N25ZG-TMS-T	TO-251S	G	D	S	-	-	-	-	-	Tube
UF3N25ZL-TN3-R	UF3N25ZG-TN3-R	TO-252	G	D	S	-	-	-	-	-	Tape Reel
UF3N25ZL-TND-R	UF3N25ZG-TND-R	TO-252D	G	D	S	-	-	-	-	-	Tape Reel
UF3N25ZL-P3030-R	UF3N25ZG-P3030-R	PDFN3×3	S	S	S	G	D	D	D	D	Tape Reel

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



(1) R: Tape Reel, T: Tube
(2) AA3: SOT-223, TM3: TO-251, TMS: TO-251S
TN3: TO-252, TND: TO-252D, P3030: PDFN3×3
(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING

PACKAGE	MARKING
SOT-223	
TO-251 / TO-251S TO-252 / TO-252D	
PDFN3×3	

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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	250	V
Gate-Source Voltage		V_{GSS}	±20	V
Continuous Drain Current	Continuous	I_D	3	A
	Pulsed	I_{DM}	6	A
Avalanche Energy		E_{AS}	73	mJ
Power Dissipation	SOT-223	P_D	1	W
	TO-251/TO-251S TO-252/TO-252D		40	W
	PDFN3×3		17.5 (Note 2)	W
Junction Temperature		T_J	+150	°C
Storage Temperature Range		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=30mH, I_{AS}=2.2A, V_{DD}=50V, R_G=25Ω, Starting T_J = 25°C.
4. I_{SD} ≤ 3.0A, di/dt ≤ 200A/μs, V_{DD} ≤ $V_{(BR)DSS}$, T_J = 25°C.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	SOT-223	θ_{JA}	50	°C/W
	TO-251/TO-251S TO-252/TO-252D		110	
	PDFN3×3		130 (Note)	
Junction to Case	SOT-223	θ_{JC}	125	°C/W
	TO-251/TO-251S TO-252/TO-252D		3.12 (Note)	
	PDFN3×3		7.14 (Note)	

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

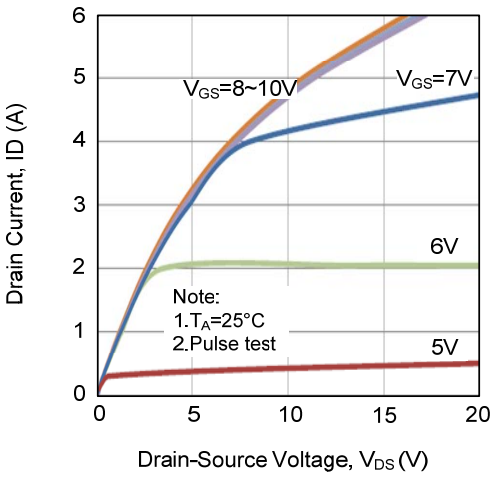
■ ELECTRICAL CHARACTERISTICS

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	I_D=250μA, V_{GS}=0V	250			V
Drain-Source Leakage Current		I_{DSS}	V_{DS}=250V			10	μA
Gate-Source Leakage Current	Forward	I_{GSS}	V_{GS}=+20V, V_{DS}=0V			10	μA
	Reverse		V_{GS}=-20V, V_{DS}=0V			-10	μA
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	I_D=250μA, V_{DS}=V_{GS}	2.0		4.0	V
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	V_{GS}=10V, I_D=3.0A			2.0	Ω
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	V_{GS}=0V, V_{DS}=25V, f=1MHz		197		pF
Output Capacitance		C_{OSS}			36		pF
Reverse Transfer Capacitance		C_{RSS}			6		pF
SWITCHING PARAMETERS							
Total Gate Charge		Q_G	V_{DD}=200V, V_{GS}=10V, I_D=3.0A, I_G=1mA (Note 1, 2)		9		nC
Gate to Source Charge		Q_{GS}			4		nC
Gate to Drain Charge		Q_{GD}			1		nC
Turn-ON Delay Time		$t_{D(ON)}$	V_{DD}=100V, V_{GS}=10V, I_D=3.0A, R_G=25Ω (Note 1, 2)		5		ns
Rise Time		t_R			17		ns
Turn-OFF Delay Time		$t_{D(OFF)}$			13		ns
Fall-Time		t_F			17		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Continuous Drain-Source Diode Forward Current		I_S				3	A
Maximum Pulsed Drain-Source Diode Forward Current		I_{SM}				12	A
Drain-Source Diode Forward Voltage		V_{SD}	I_S=3.0A			1.3	V
Reverse Recovery Time (Note 1)		t_{rr}	I_S =3.0A, V_{GS}=0V, dI_F/dt=100A/μs		113		ns
Reverse Recovery Charge		Q_{rr}			0.5		μC

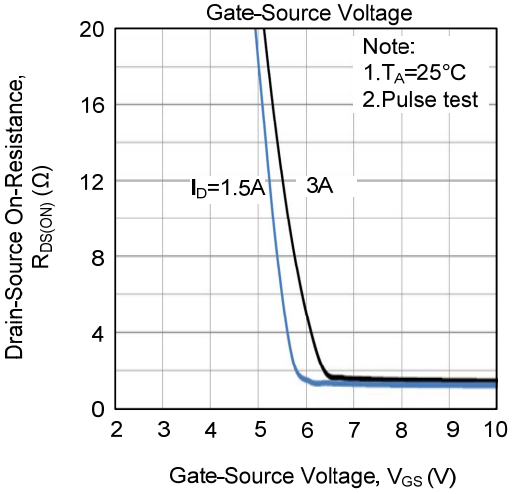
Notes: 1. Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2 %.
2. Essentially independent of operating temperature.

■ TYPICAL CHARACTERISTICS

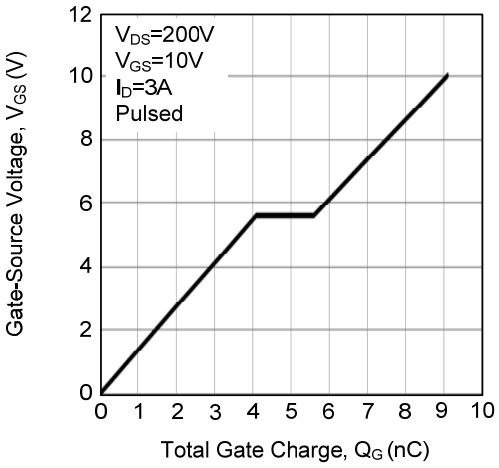
Drain Current vs. Drain-Source Voltage



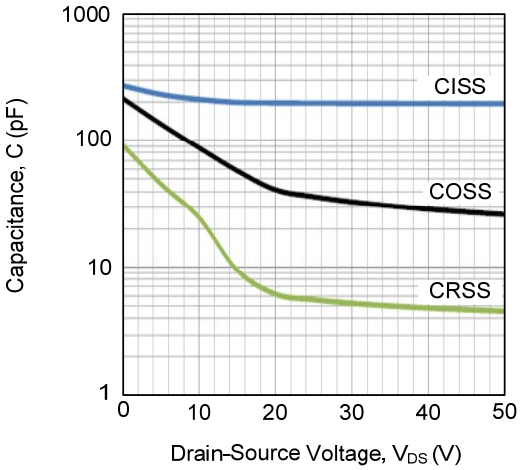
Drain-Source On-Resistance vs. Gate-Source Voltage



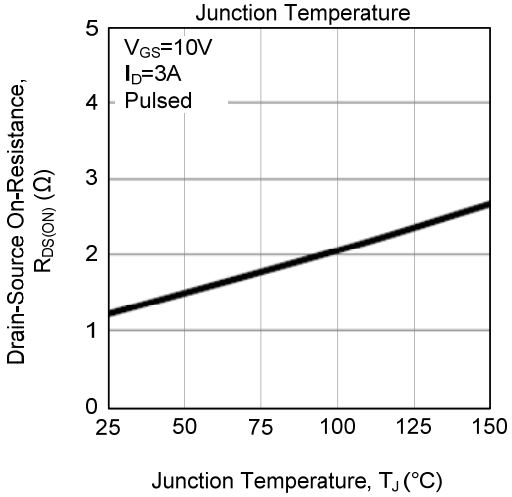
Gate Charge Characteristics



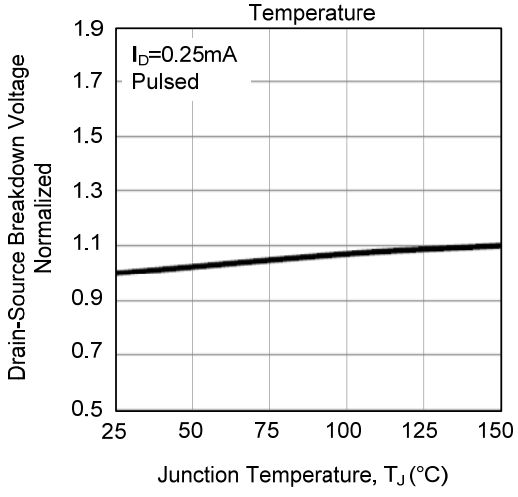
Capacitance Characteristics



Drain-Source On-Resistance vs. Junction Temperature

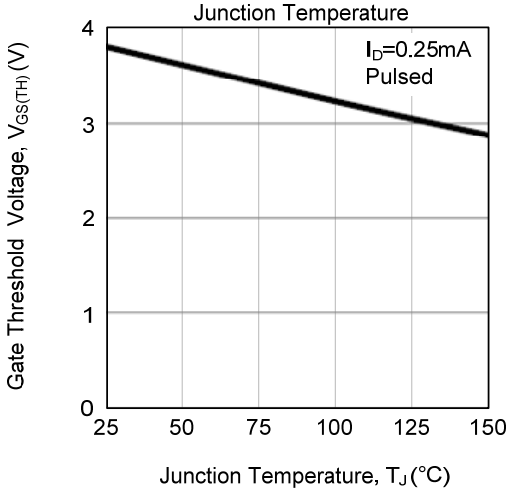


Breakdown Voltage vs. Junction Temperature

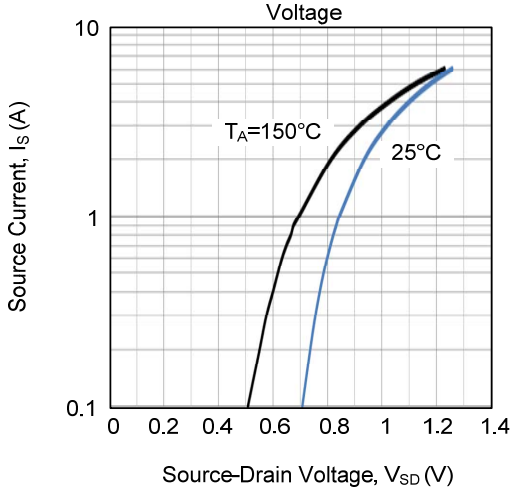


■ TYPICAL CHARACTERISTICS (Cont.)

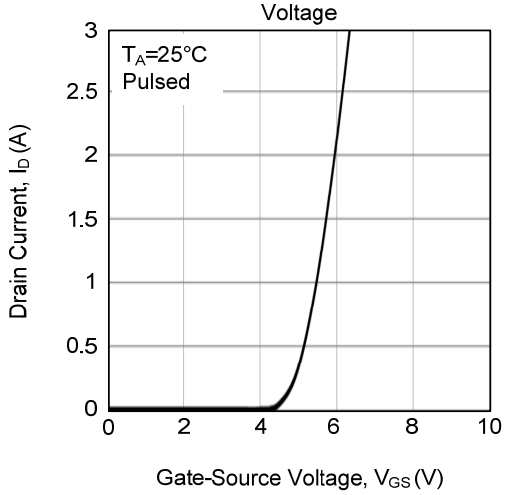
Gate Threshold Voltage vs. Junction Temperature



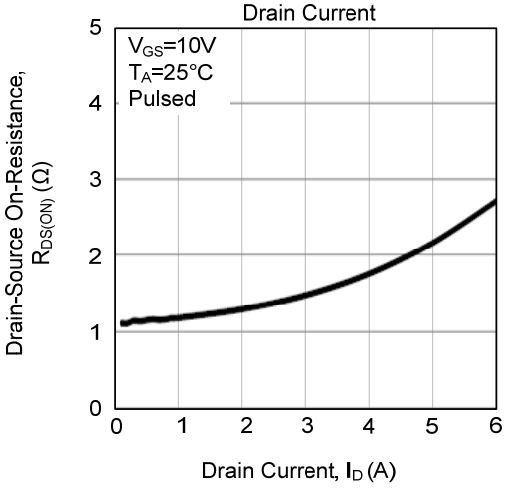
Source Current vs. Source-Drain Voltage



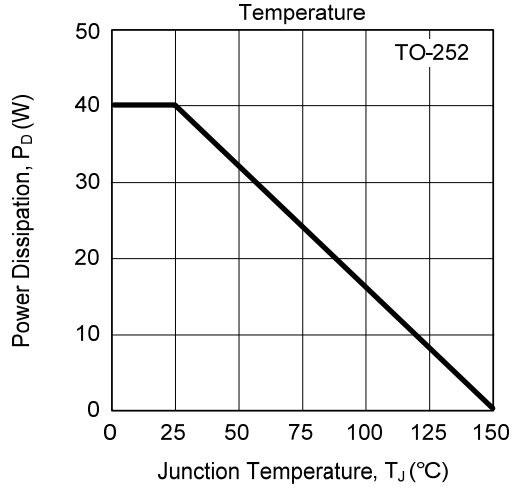
Drain Current vs. Gate-Source Voltage



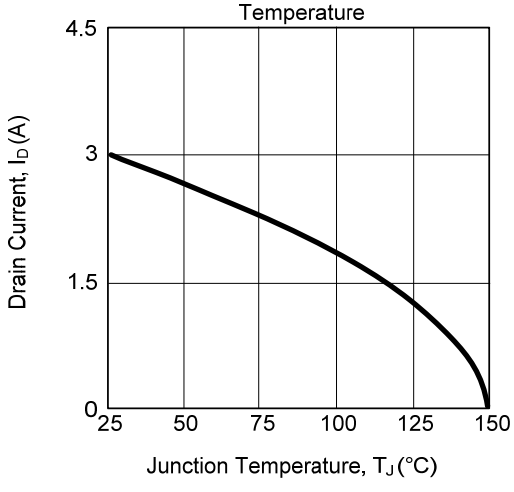
Drain-Source On-Resistance vs. Drain Current



Power Dissipation vs. Junction Temperature



Drain Current vs. Junction Temperature



■ TYPICAL CHARACTERISTICS (Cont.)