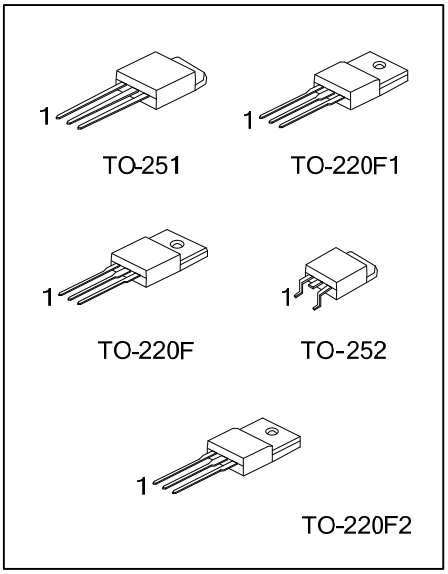
25N10

Power MOSFET

N-CHANNEL ENHANCEMENT MODE POWER MOSFET



■ DESCRIPTION

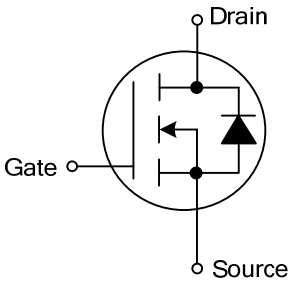
The UTC **25N10** is an N-channel enhancement mode power MOSFET and it uses UTC's perfect technology to provide designers with fast switching, ruggedized device design, low on-resistance and cost-effectiveness.

It is generally suitable for all commercial-industrial applications and DC/DC converters requiring low voltage.

■ FEATURES

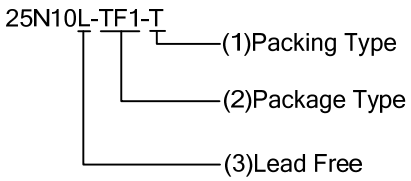
* Single Drive Requirement
* Low Gate Charge
* RoHS Compliant

■ SYMBOL



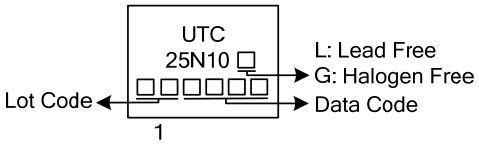
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free Plating	Halogen Free		1	2	3	
25N10L-TF1-T	25N10G-TF1-T	TO-220F1	G	D	S	Tube
25N10L-TF2-T	25N10G-TF2-T	TO-220F2	G	D	S	Tube
25N10L-TF3-T	25N10G-TF3-T	TO-220F	G	D	S	Tube
25N10L-TM3-T	25N10G-TM3-T	TO-251	G	D	S	Tube
25N10L-TN3-R	25N10G-TN3-R	TO-252	G	D	S	Tape Reel



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

■ MARKING INFORMATION

PACKAGE	MARKING
TO-220F1 TO-220F2 TO-220 TO-251 TO-252	

■ ABSOLUTE MAXIMUM RATINGS

PARAMETER		SYMBOL	RATINGS	UNIT
Drain Source Voltage		V_{DSS}	100	V
Gate Source Voltage		V_{GSS}	±20	V
Continuous Drain Current (V_{GS}=10V)	T_C =25°C	I_D	23	A
	T_C = 100°C	I_D	14.6	A
Pulsed Drain Current (Note 2)		I_{DM}	80	A
Total Power Dissipation (T_C =25°C)	TO-220F/TO-220F1	P_D	50	W
	TO-220F2		52	
	TO-251/TO-252		41	
Operating Junction Temperature		T_J	-55 ~ +150	°C
Storage Temperature		T_{STG}	-55 ~ +150	°C

Note: 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. Pulse width limited by max. junction temperature

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220F/TO-220F1 TO-220F2	θ_{JA}	62.5	°C/W
	TO-251/TO-252		100	
Junction to Case	TO-220F/TO-220F1	θ_{JC}	2.5	°C/W
	TO-220F2		2.4	
	TO-251/TO-252		3	

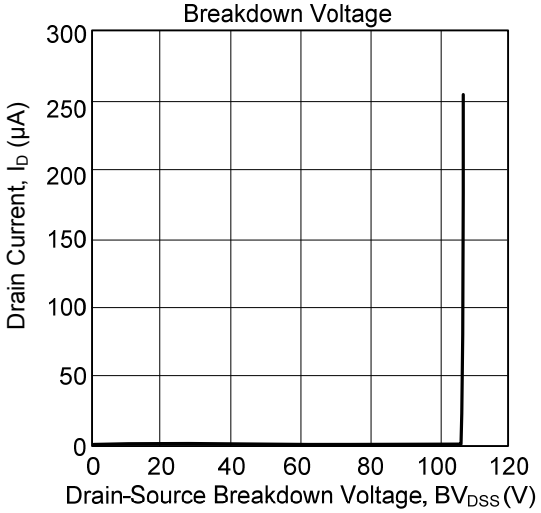
■ ELECTRICAL CHARACTERISTICS (T_J=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} =0V, I_D =1mA	100			V
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to 25°C , I_D =1mA		0.14		V/°C
Drain-Source Leakage Current	I_{DSS}	V_{DS} =100V, V_{GS} =0V, T_J=25°C			25	μA
		V_{DS} =80V, V_{GS} =0V,T_J =150°C			100	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS} =±20V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS} =V_{GS}, I_D =250μA	2		4	V
Static Drain-Source On-Resistance (Note)	$R_{DS(ON)}$	V_{GS} =10V, I_D =16A			80	mΩ
Forward Transconductance	g_{FS}	V_{DS} =10V, I_D =16A		14		S
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	V_{DS} =25V, V_{GS}=0V, f=1.0MHz		1060	1700	pF
Output Capacitance	C_{OSS}			270		pF
Reverse Transfer Capacitance	C_{RSS}			8		pF
Gate Resistance	R_G	f=1.0MHz		1.5	2.3	Ω
SWITCHING PARAMETERS						
Total Gate Charge (Note)	Q_G	V_{GS}=10V, V_{DS}=80V, I_D=16A		19	30	nC
Gate Source Charge	Q_{GS}			5		nC
Gate Drain Charge	Q_{GD}			6		nC
Turn-ON Delay Time[1]	$t_{D(ON)}$	V_{DD}=50V, I_D=16A, R_G=3.3Ω, V_{GS}=10V, R_D=3.125Ω		10		ns
Turn-ON Rise Time	t_R			28		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			17		ns
Turn-OFF Fall-Time	t_F			2		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage (Note)	V_{SD}	I_S =16A, V_{GS} =0V			1.3	V
Reverse Recovery Time	t_{RR}	I_S =16A,V_{GS} =0V, dI/dt=100A/μs		90		ns
Reverse Recovery Charge	Q_{RR}			380		nC

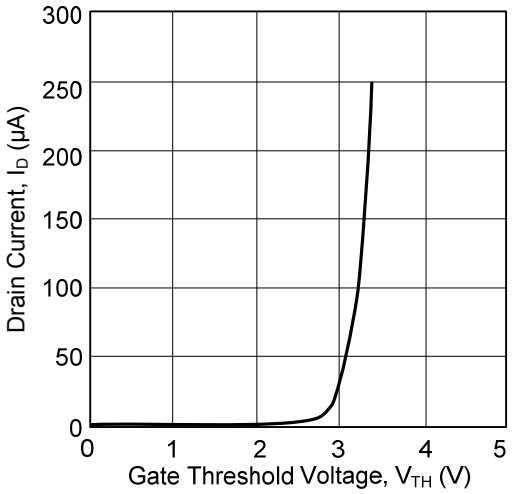
Note: Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2%.

■ TYPICAL CHARACTERISTICS

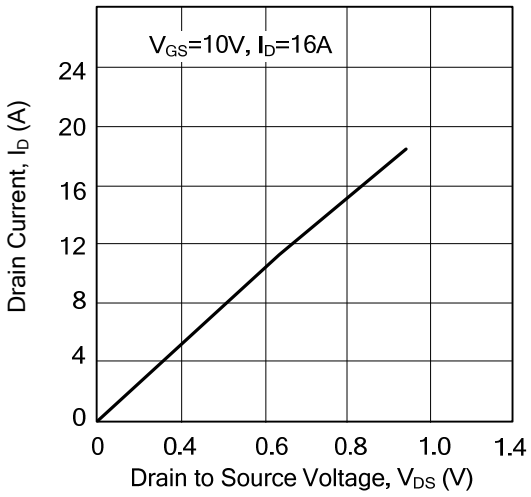
Drain Current vs. Drain-Source Breakdown Voltage



Drain Current vs. Gate Threshold Voltage



Drain-Source On-State Resistance Characteristics



Drain Current vs. Source to Drain Voltage