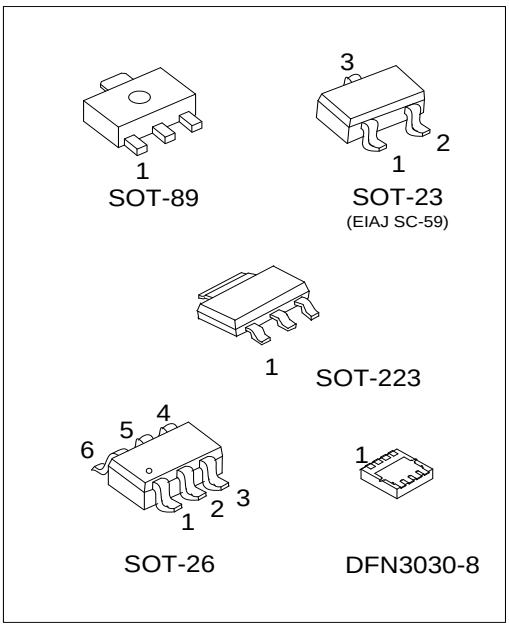
UT3N10

Power MOSFET

N-CHANNEL ENHANCEMENT MODE POWER MOSFET



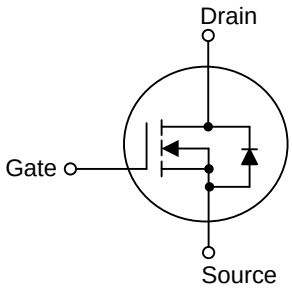
■ DESCRIPTION

The UTC **UT3N10** is an N-channel power MOSFET providing very low on-resistance. It has high efficiency and perfect cost-effectiveness. It can be generally applied in the commercial and industrial fields.

■ FEATURES

* $R_{DS(ON)} \leq 0.165\Omega$ @ V_{GS} =10V, I_D =3.0A
  $R_{DS(ON)} \leq 0.180\Omega$ @ V_{GS} =4.5V, I_D =2.0A
* Simple drive requirement

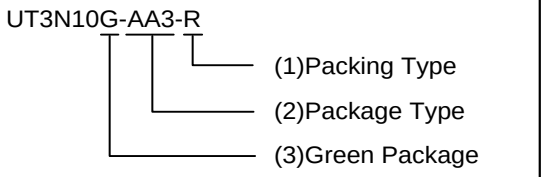
■ SYMBOL



■ ORDERING INFORMATION

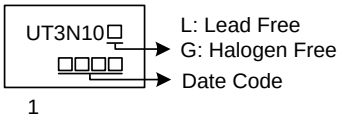
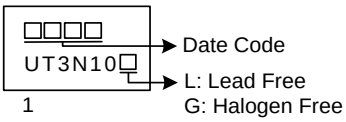
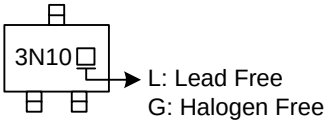
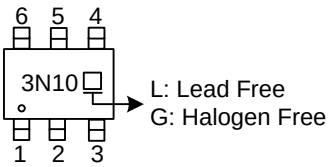
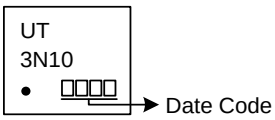
Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UT3N10L-AA3-R	UT3N10G-AA3-R	SOT-223	G	D	S	-	-	-	-	-	Tape Reel
UT3N10L-AB3-R	UT3N10G-AB3-R	SOT-89	G	D	S	-	-	-	-	-	Tape Reel
UT3N10L-AE3-R	UT3N10G-AE3-R	SOT-23	G	S	D	-	-	-	-	-	Tape Reel
UT3N10L-AG6-R	UT3N10G-AG6-R	SOT-26	D	D	G	S	D	D	-	-	Tape Reel
UT3N10L-K08-3030-R	UT3N10G-K08-3030-R	DFN3030-8	S	S	S	G	D	D	D	D	Tape Reel

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



(1) R: Tape Reel
(2) AA3: SOT-223, AB3: SOT-89, AE3: SOT-23
AG6: SOT-26, K08-3030: DFN3030-8
(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING

PACKAGE	MARKING
SOT-223	
SOT-89	
SOT-23	
SOT-26	
DFN3030-8	

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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	100	V
Gate-Source Voltage		V_{GSS}	±20	V
Continuous Drain Current (V_{GS}=4.5V, T_A= 25°C) (Note 2)		I_D	3.0	A
Pulsed Drain Current (Note 3, 4)		I_{DM}	10	A
Power Dissipation (T_A= 25°C)	SOT-223	P_D	0.89	W
	SOT-89		0.55	W
	SOT-23 SOT-26		0.35	W
	DFN3030-8		0.96	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. Surface mounted on 1 in^2 copper pad of FR4 board; 270°C/W when mounted on min. copper pad.
3. Repetitive Rating: Pulse width limited by maximum junction temperature.
4. Pulse width ≤300μs, duty cycle≤2%.

■ THERMAL CHARACTERISTICS

PARAMETER		SYMBOL	RATING	UNIT
Junction to Ambient (Note)	SOT-223	θ_{JA}	140	°C/W
	SOT-89		180	°C/W
	SOT-23 SOT-26		350	°C/W
	DFN3030-8		130	°C/W

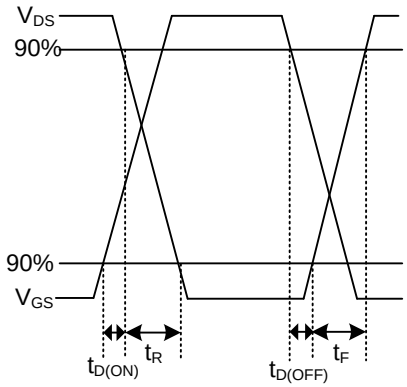
Note: The data tested by surface mounted on a 1 $inch^2$ FR-4 board with 2OZ copper.

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

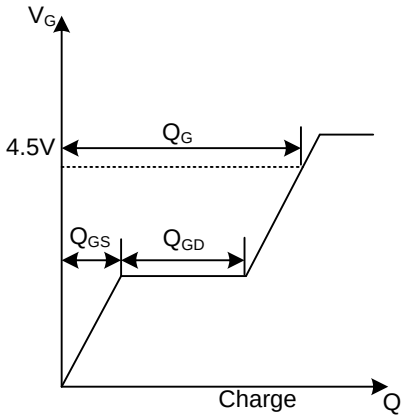
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} =0V, I_D =250μA	100			V
Breakdown Voltage Temperature Coefficient	$\frac{\Delta BV_{DSS}}{\Delta T_J}$	Reference to 25°C, I_D=1mA		0.05		V/°C
Drain-Source Leakage Current	I_{DSS}	V_{DS} =100V,V_{GS} =0V			10	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	1.0		3.0	V
Drain to Source On-state Resistance	$R_{DS(ON)}$	V_{GS} =10V, I_D =3.0A			0.165	Ω
		V_{GS} =4.5V, I_D =2.0A			0.180	Ω
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	V_{DS}=25V,V_{GS}=0V,f =1.0MHz		490	780	pF
Output Capacitance	C_{OSS}			41		pF
Reverse Transfer Capacitance	C_{RSS}			33		pF
SWITCHING PARAMETERS						
Total Gate Charge (Note)	Q_G	V_{GS} =4.5V, V_{DS} =48V, I_D =3A		18		nC
Gate Source Charge	Q_{GS}			3.76		nC
Gate Drain Charge	Q_{GD}			8.5		nC
Turn-ON Delay Time (Note)	$t_{D(ON)}$	V_{GS}=10V, V_{DS}=30V, I_D=1A, R_D =30Ω, R_G =3.3Ω		22		ns
Turn-ON Rise Time	t_R			18		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			190		ns
Turn-OFF Fall-Time	t_F			65		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage (Note)	V_{SD}	I_S =1.2A, V_{GS} =0V			1.2	V
Reverse Recovery Time	t_{rr}	I_S=3A,V_{GS}=0V, dI/dt=100A/μs		25		ns
Reverse Recovery Charge	Q_{rr}			26		nC

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

■ TEST WAVEFORMS



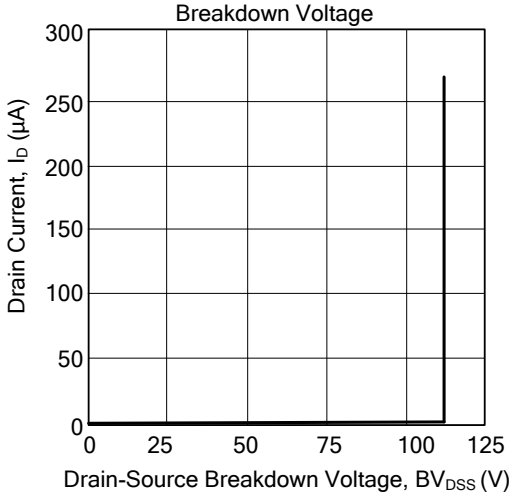
Switching Time Waveform



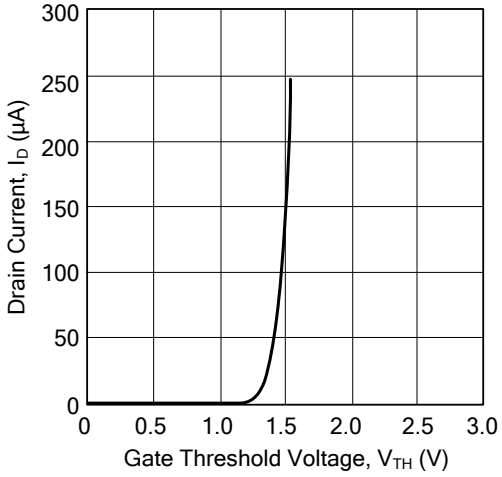
Gate Charge Waveform

■ TYPICAL CHARACTERISTICS

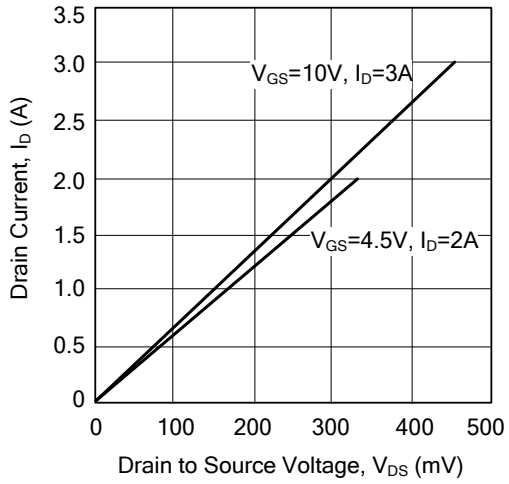
Drain Current vs. Drain-Source Breakdown Voltage



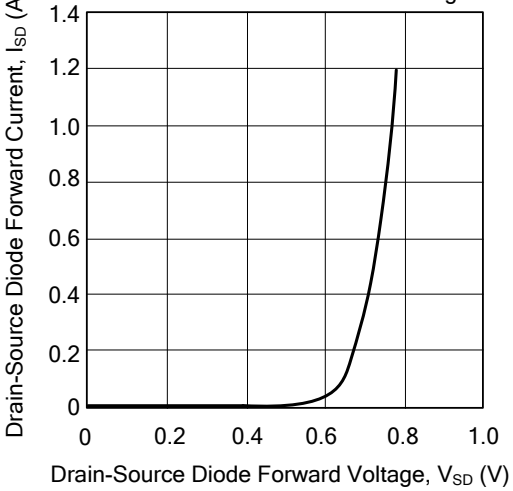
Drain Current vs. Gate Threshold Voltage



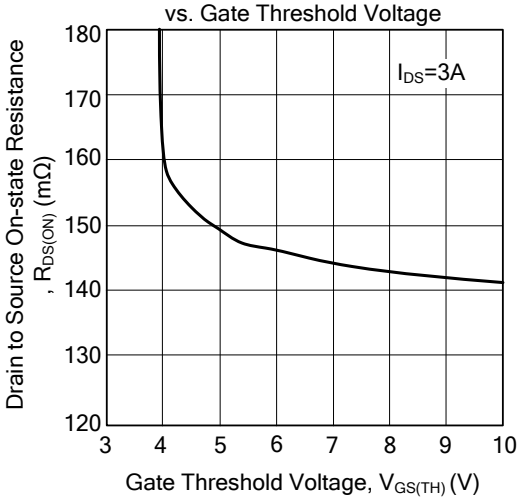
Drain-Source On-State Resistance Characteristics



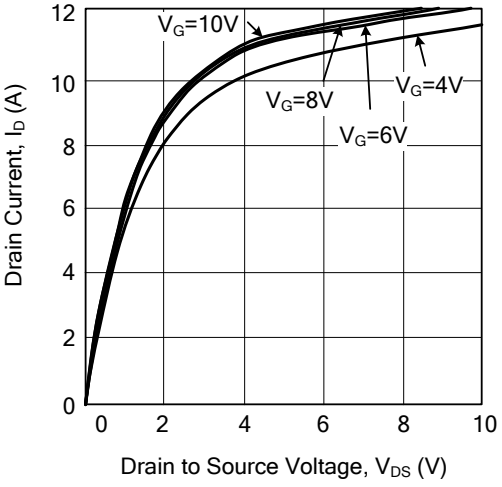
Drain-Source Diode Forward Current vs. Drain-Source Diode Forward Voltage



Drain to Source On-state Resistance vs. Gate Threshold Voltage



On-State Characteristics



■ TYPICAL CHARACTERISTICS