



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.

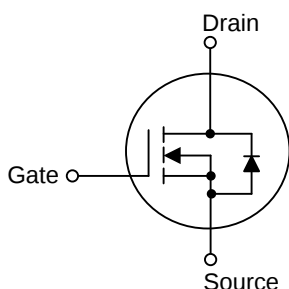
FEATURES

* $R_{DS(ON)} \leq 0.165\Omega$ @ $V_{GS}=10V$, $I_D=3.0A$

$R_{DS(ON)} \leq 0.180\Omega$ @ $V_{GS}=4.5V$, $I_D=2.0A$

* Simple drive requirement

SYMBOL

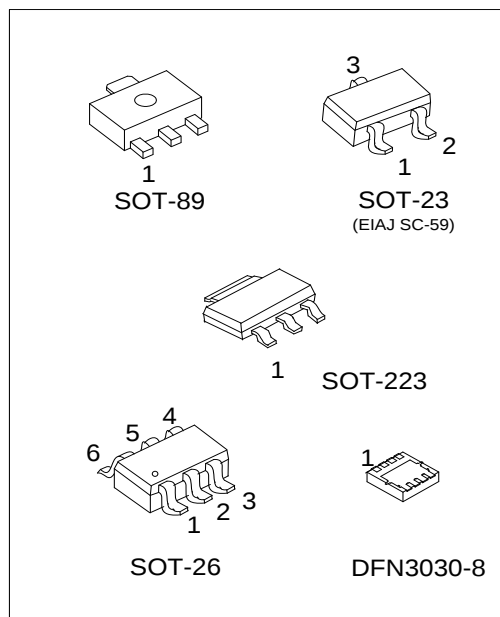


ORDERING INFORMATION

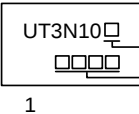
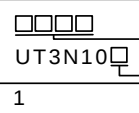
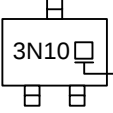
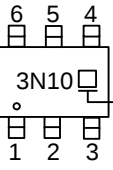
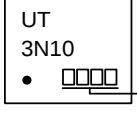
Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UT3N10L-AA3-R	UT3N10G-AA3-R	SOT-223	G	D	S	-	-	-	-	-	Tape Reel
UT3N10L-AB3-R	UT3N10G-AB3-R	SOT-89	G	D	S	-	-	-	-	-	Tape Reel
UT3N10L-AE3-R	UT3N10G-AE3-R	SOT-23	G	S	D	-	-	-	-	-	Tape Reel
UT3N10L-AG6-R	UT3N10G-AG6-R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

UT3N10G-AA3-R 		(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
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■ MARKING

PACKAGE	MARKING
SOT-223	 L: Lead Free G: Halogen Free Date Code
SOT-89	 Date Code L: Lead Free G: Halogen Free
SOT-23	 L: Lead Free G: Halogen Free
SOT-26	 L: Lead Free G: Halogen Free
DFN3030-8	 Date Code

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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	100	V
Gate-Source Voltage		V_{GSS}	± 20	V
Continuous Drain Current ($V_{GS}=4.5\text{V}$, $T_A=25^\circ\text{C}$) (Note 2)		I_D	3.0	A
Pulsed Drain Current (Note 3, 4)		I_{DM}	10	A
Power Dissipation ($T_A=25^\circ\text{C}$)	SOT-223	P_D	0.89	W
	SOT-89		0.55	W
	SOT-23		0.35	W
	SOT-26		0.35	W
	DFN3030-8		0.96	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. Surface mounted on 1 in² 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 $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.

■ THERMAL CHARACTERISTICS

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

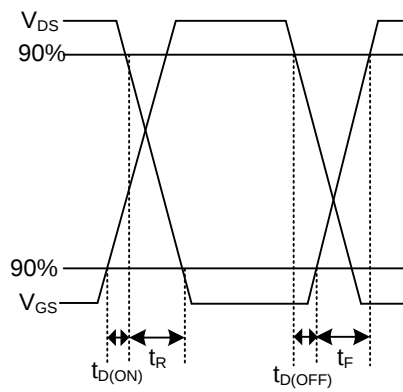
Note: The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.

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

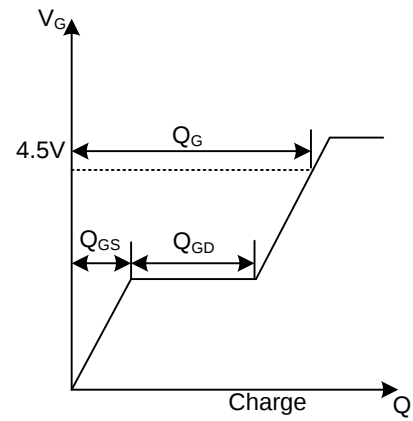
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	100			V
Breakdown Voltage Temperature Coefficient	$\frac{\Delta BV_{DSS}}{\Delta T_J}$	Reference to 25°C, I _D =1mA		0.05		V/°C
Drain-Source Leakage Current	I _{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

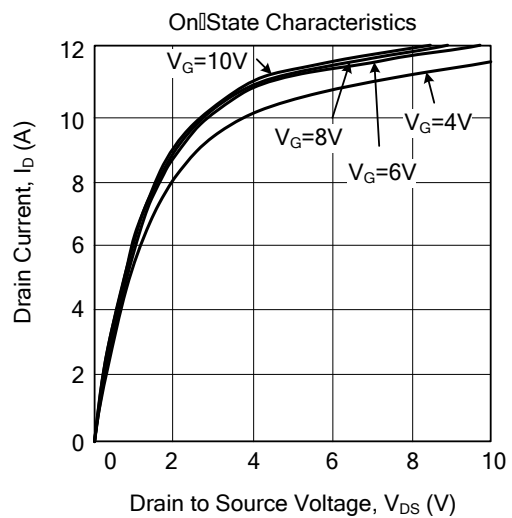
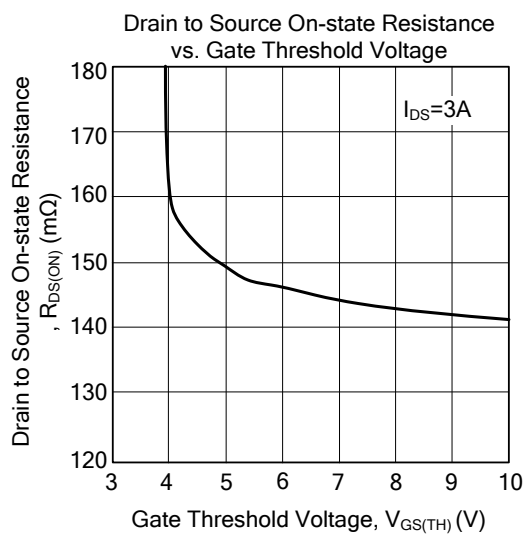
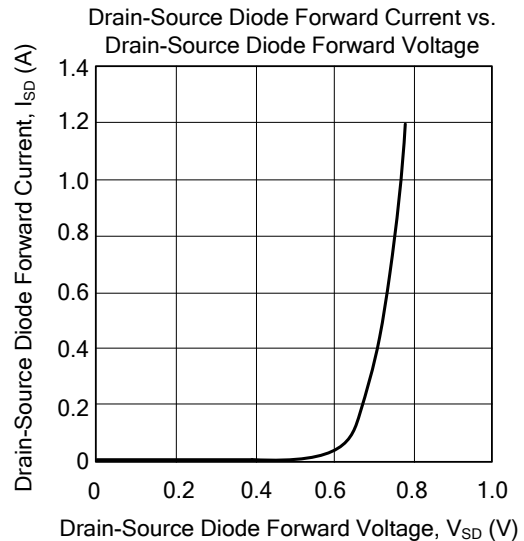
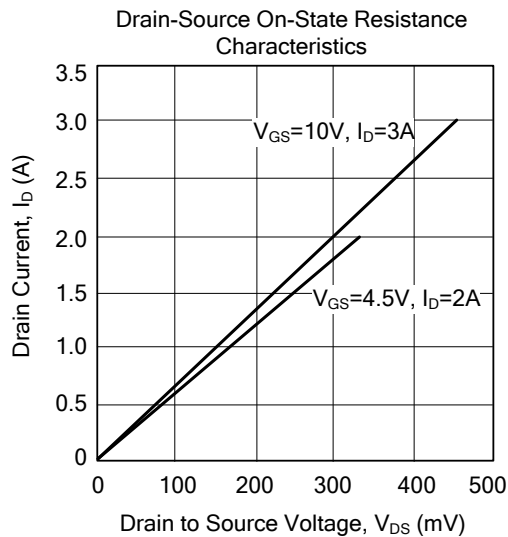
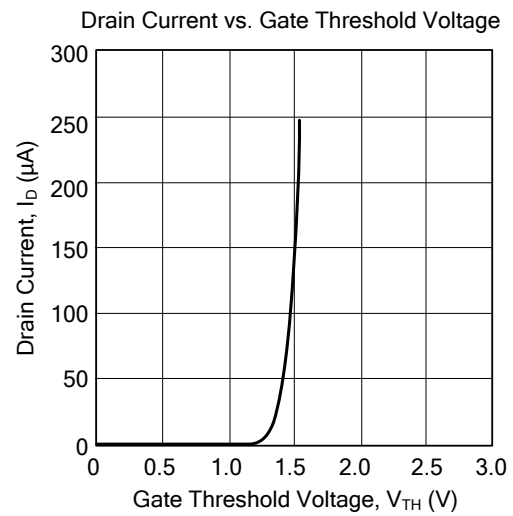
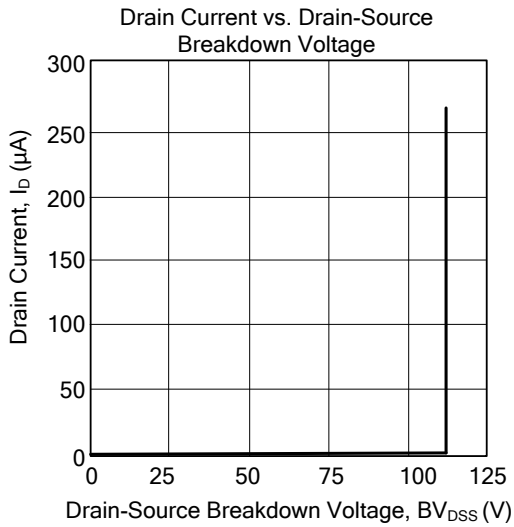


Switching Time Waveform

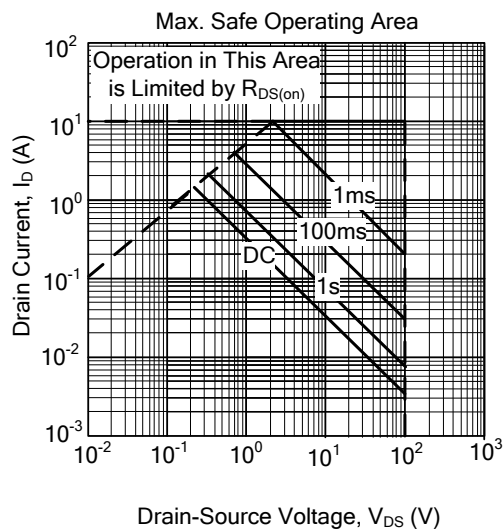


Gate Charge Waveform

TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS



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