



6N10

Power MOSFET

6.5 Amps, 100 Volts N-CHANNEL POWER MOSFET

DESCRIPTION

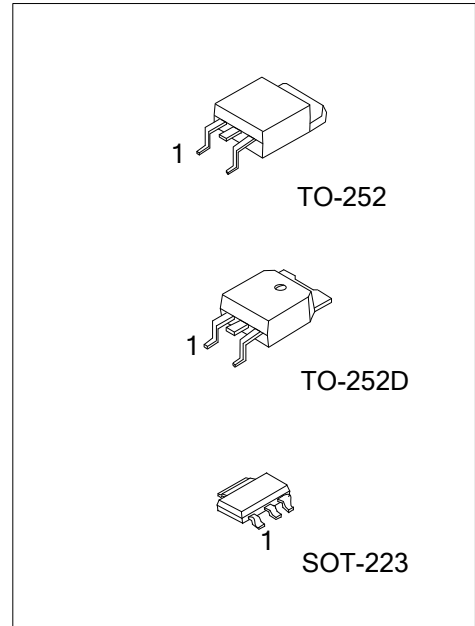
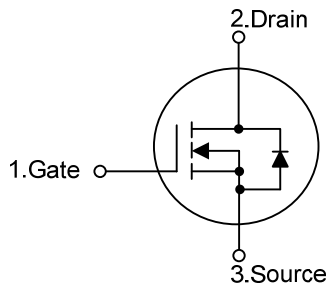
The UTC **6N10** is an N-Channel enhancement mode power FET providing customers with excellent switching performance and minimum on-state resistance.

The UTC **6N10** is generally applied in voltage applications, such as DC motor control, audio amplifier and high efficiency switching DC/DC converters.

FEATURES

- * $R_{DS(ON)} < 0.2\Omega$ @ $V_{GS}=10V$, $I_D=3A$
- * Fast switching
- * Improved dv/dt capability

SYMBOL



ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
-	6N10G-AA3-R	SOT-223	G	D	S	Tape Reel
6N10L-TN3-R	6N10G-TN3-R	TO-252	G	D	S	Tape Reel
6N10L-TND-R	6N10G-TND-R	TO-252D	G	D	S	Tape Reel

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

6N10G-AA3-R (1) Packing Type (2) Package Type (3) Green Package	(1) R: Tape Reel (2) AA3: SOT-223, TN3: TO-252, TND: TO-252D (3) G: Halogen Free and Lead Free, L: Lead Free
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MARKING

SOT-223	TO-252 / TO-252D
6N10G □□□ 1 → Data Code	UTC 6N10 □□□□□ 1 ← Lot Code → Data Code L: Lead Free G: Halogen Free

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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current	Continuous	I_D	6.5	A
	Pulsed	I_{DM}	8.0	A
Repetitive Avalanche Energy (Duty Cycle $\leq 1\%$)	$L=0.1\text{mH}$	E_{AR}	1.25	mJ
Power Dissipation	SOT-223	P_D	2.2	W
	TO-252/TO-252D		16	
Junction Temperature		T_J	+150	$^\circ\text{C}$
Storage Temperature		T_{STG}	-55~+150	$^\circ\text{C}$

Note : 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.

■ THERMAL CHARACTERISTICS

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	SOT-223	θ_{JA}	55	$^\circ\text{C/W}$
	TO-252/TO-252D		100	
Junction to Case	SOT-223	θ_{JC}	12	$^\circ\text{C/W}$
	TO-252/TO-252D		7.5	

Note: θ_{JA} is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins.

θ_{JC} is guaranteed by design while θ_{JA} is determined by the user's board design.

■ ELECTRICAL CHARACTERISTICS ($T_J=25^\circ\text{C}$, unless otherwise noted)

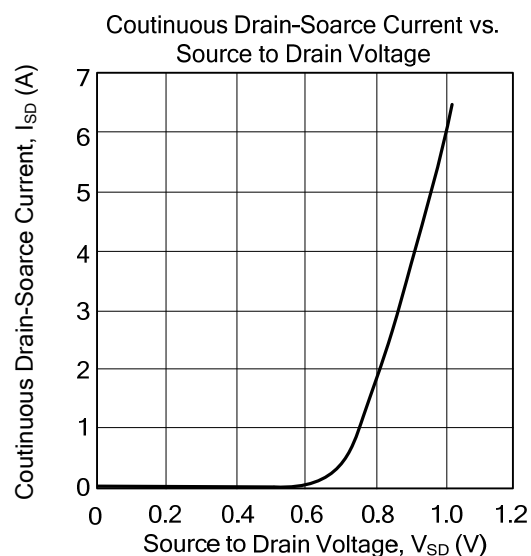
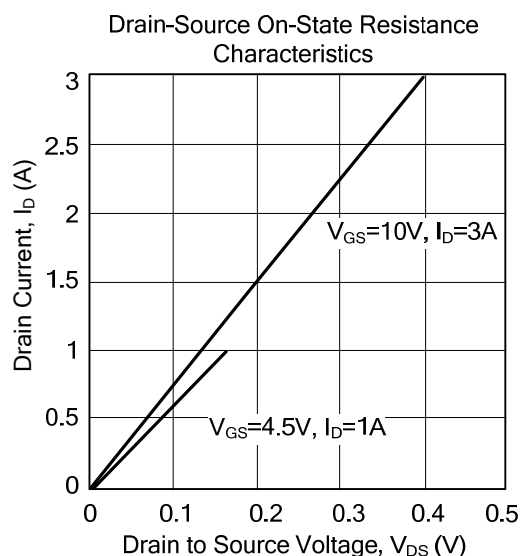
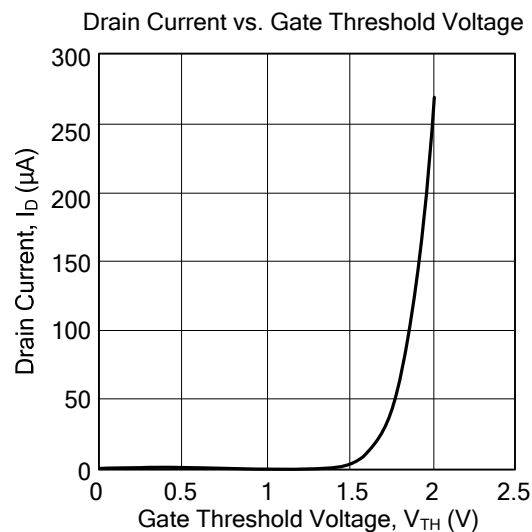
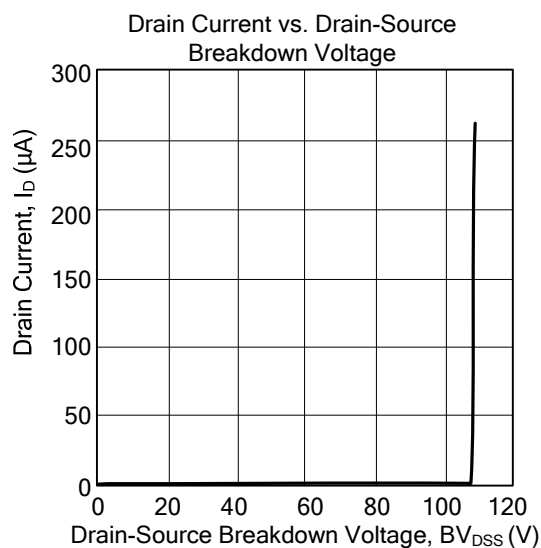
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	$I_D=250\mu A, V_{GS}=0V$	100			V
Drain-Source Leakage Current		I_{DSS}	$V_{DS}=100V, V_{GS}=0V$			1	μA
			$V_{DS}=100V, V_{GS}=0V, T_J=125^{\circ}C$			50	μA
			$V_{DS}=100V, V_{GS}=0V, T_J=150^{\circ}C$			250	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-State Drain Current (Note 2)		$I_{D(on)}$	$V_{DS}=5V, V_{GS}=10V$	8.0			A
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0		3.0	V
Static Drain-Source On-State Resistance (Note 2)		$R_{DS(ON)}$	$V_{GS}=10V, I_D=3A$		0.150	0.200	Ω
			$V_{GS}=10V, I_D=3A, T_J=125^{\circ}C$			0.350	
			$V_{GS}=10V, I_D=3A, T_J=150^{\circ}C$			0.450	
			$V_{GS}=4.5V, I_D=1.0A$		0.160	0.225	
Forward Transconductance (Note 2)		g_{FS}	$V_{DS}=15V, I_D=3A$		8.5		S
DYNAMIC PARAMETERS (Note1)							
Input Capacitance		C_{ISS}	$V_{GS}=0V, V_{DS}=25V, f=1.0MHz$		320		pF
Output Capacitance		C_{OSS}			80		pF
Reverse Transfer Capacitance		C_{RSS}			17		pF
SWITCHING PARAMETERS							
Turn-ON Delay Time (Note3)		$t_{D(ON)}$	$V_{DD}=30V, R_L=7.5\Omega, I_D=0.5A, V_{GEN}=10V, R_G=25\Omega$		28	58	ns
Rise Time (Note 3)		t_R			30	60	ns
Turn-OFF Delay Time (Note 3)		$t_{D(OFF)}$			148	178	ns
Fall-Time (Note 3)		t_F			52	82	ns
Total Gate Charge (Note 3)		Q_G	$V_{DS}=50V, V_{GS}=10V, I_D=1.3A, I_G=100\mu A$		27	75	nC
Gate to Source Charge (Note 3)		Q_{GS}			2.4		nC
Gate to Drain Charge (Note 3)		Q_{GD}			6.8		nC
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS ($T_C=25^{\circ}C$)							
Maximum Pulsed Drain-Source Diode Forward Current		I_{SM}				8.0	A
Drain-Source Diode Forward Voltage (Note 2)		V_{SD}	$I_F=6.5A, V_{GS}=0V$		0.9	1.3	V
Reverse Recovery Time		t_{RR}	$I_F=6.5A, di/dt=100A/\mu s$		35	60	ns

Notes: 1. Guaranteed by design, not subject to production testing.

2. Pulse test; pulse width $\leq 300 \mu\text{s}$, duty cycle $\leq 2\%$.

3. Independent of operating temperature.

■ TYPICAL CHARACTERISTICS



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