



6N10

Power MOSFET

6.5 Amps, 100 Volts N-CHANNEL POWER MOSFET

■ DESCRIPTION

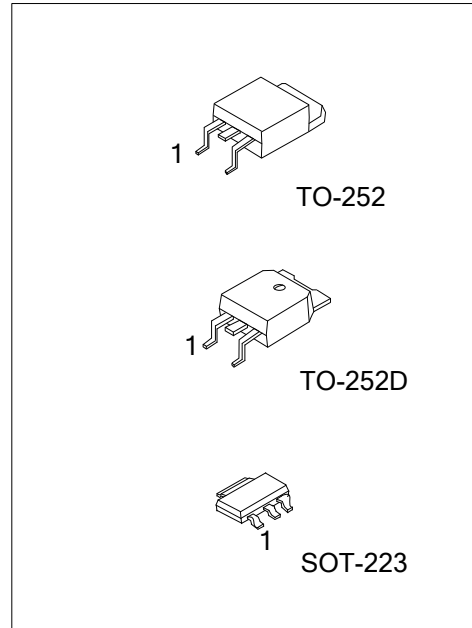
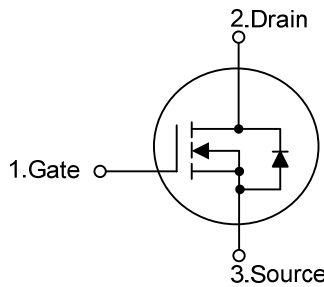
The UTC **6N10** is an N-Channel enhancement mode power FET providing customers with excellent switching performance and minimum on-state resistance.

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

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

SOT-223	TO-252 / TO-252D

■ 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=0.1mH	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.

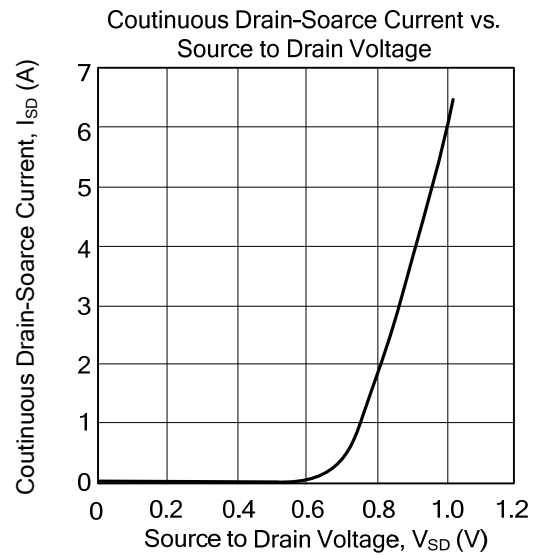
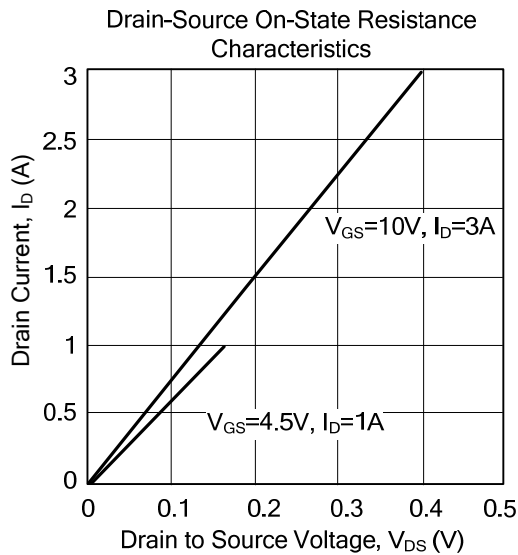
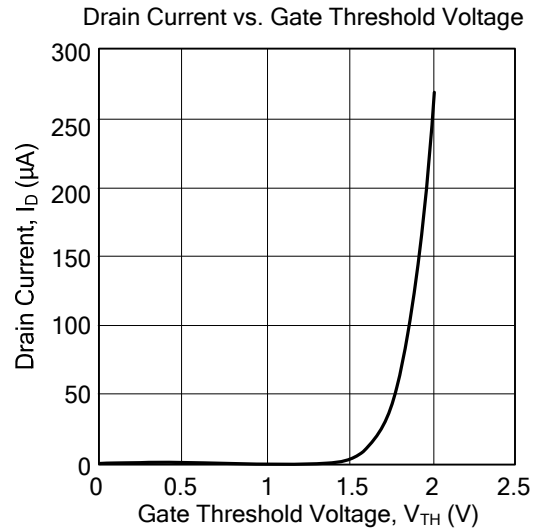
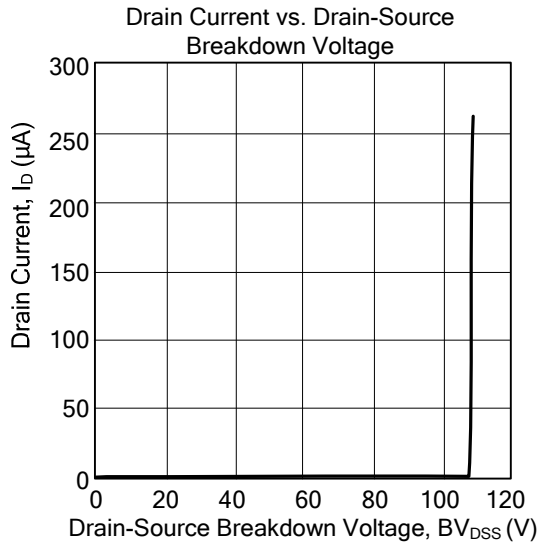
θ_{JC} is guaranteed by design while θ_{JA} is determined by the user's board design.

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	I _D =250μA, 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°C			50	μA
		V _{DS} =100V, V _{GS} =0V, T _J =150°C			250	μA
Gate- Source Leakage Current	Forward	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 =250μA	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°C			0.350	
		V _{GS} =10V, I _D =3A, T _J =150°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 =7.5Ω, I _D =0.5A, V _{GEN} =10V, R _G =25 Ω		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 =100μA		27	75
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°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/μs		35	60	ns

- Notes: 1. Guaranteed by design, not subject to production testing.
 2. Pulse test; pulse width ≤300 μs, duty cycle ≤2%.
 3. Independent of operating temperature.

■ TYPICAL CHARACTERISTICS



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