



UT100N03

Power MOSFET

100A, 30V N-CHANNEL POWER MOSFET

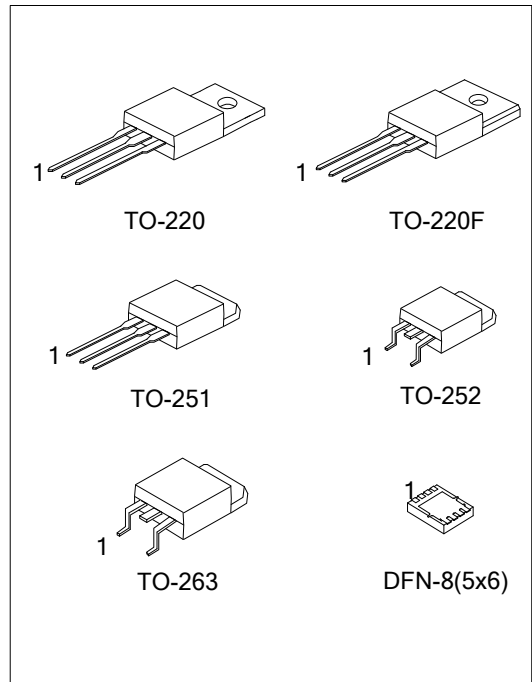
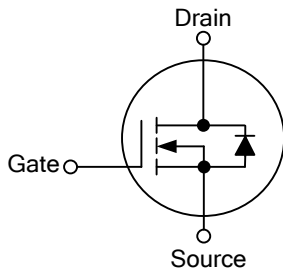
■ DESCRIPTION

The **UT100N03** uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with low gate voltages. This device is suitable for use as a load switch or in PWM applications.

■ FEATURES

- * $R_{DS(ON)} < 5.3m\Omega @ V_{GS}=10V, I_D=50A$
- * $R_{DS(ON)} < 8.0m\Omega @ V_{GS}=4.5V, I_D=40A$

■ SYMBOL



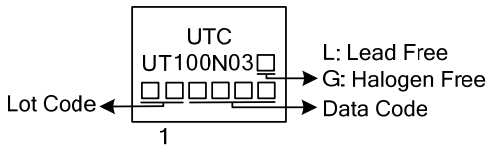
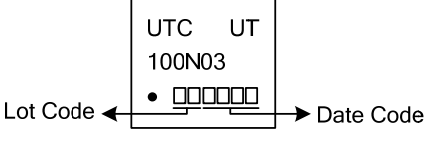
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UT100N03L-TA3-T	UT100N03G-TA3-T	TO-220	G	D	S	-	-	-	-	-	Tube
UT100N03L-TF3-T	UT100N03G-TF3-T	TO-220F	G	D	S	-	-	-	-	-	Tube
UT100N03L-TM3-T	UT100N03G-TM3-T	TO-251	G	D	S	-	-	-	-	-	Tube
UT100N03L-TN3-R	UT100N03G-TN3-R	TO-252	G	D	S	-	-	-	-	-	Tape Reel
UT100N03L-TND-R	UT100N03G-TND-R	TO-252D	G	D	S	-	-	-	-	-	Tape Reel
UT100N03L-TQ2-T	UT100N03G-TQ2-T	TO-263	G	D	S	-	-	-	-	-	Tube
UT100N03L-TQ2-R	UT100N03G-TQ2-R	TO-263	G	D	S	-	-	-	-	-	Tape Reel
-	UT100N03G-K08-5060-R	DFN-8(5x6)	S	S	S	G	D	D	D	D	Tape Reel

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

<p>UT100N03L-TA3-T</p> <p>(1)Packing Type</p> <p>(2)Package Type</p> <p>(3)Green Package</p>	<p>(1) T: Tube, R: Tape Reel</p> <p>(2) TA3: TO-220, TF3: TO-220F, TM3: TO-251, TN3: TO-252, TND: TO-252D, TQ2: TO-263, K08-5060: DFN-8(5x6)</p> <p>(3) L: Lead Free, G: Halogen Free and Lead Free</p>
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■ MARKING

TO-251 / TO-252 / TO-252D / TO-263	DFN-8(5×6)
 <p>UTC UT100N03 □□□□□ 1</p> <p>Lot Code ←</p> <p>→ L: Lead Free → G: Halogen Free → Data Code</p>	 <p>UTC UT 100N03 • □□□□□</p> <p>Lot Code ←</p> <p>→ Date Code</p>

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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	30	V
Gate-Source Voltage		V_{GSS}	± 20	V
Continuous Drain Current		I_D	100	A
Pulsed Drain Current (Note 2)		I_{DM}	400	A
Single Pulsed Avalanche Current (Note 3)		I_{AS}	35	A
Single Pulsed Avalanche Energy (Note 3)		E_{AS}	875	mJ
Power Dissipation	TO-220/TO-263	P_D	100	W
	TO-220F		36	
	TO-251/TO-252		50	
	TO-252D		21	
	DFN-8(5x6)		21	
Junction Temperature		T_J	+175	$^\circ\text{C}$
Storage Temperature		T_{STG}	-55 ~ +175	$^\circ\text{C}$

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. Pulse width limited by maximum junction temperature

3. $L = 0.5\text{mH}$, $I_{AS} = 35\text{A}$, $V_{DD} = 25\text{V}$, $R_G = 25\Omega$, Starting $T_J = 25^\circ\text{C}$.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220/TO-220F TO-263	θ_{JA}	62.5	$^\circ\text{C/W}$
	TO-251/TO-252 TO-252D		110	
	DFN-8(5x6)		40.3 (Note 1, 2)	
Junction to Case	TO-220/TO-263	θ_{JC}	1.5	$^\circ\text{C/W}$
	TO-220F		3.47	
	TO-251/TO-252 TO-252D		3	
	DFN-8(5x6)		6 (Note 1, 2)	

Notes: 1. Maximum under Steady State conditions is 90°C/W .

2. Surface Mounted on 1" x 1" FR4 board.

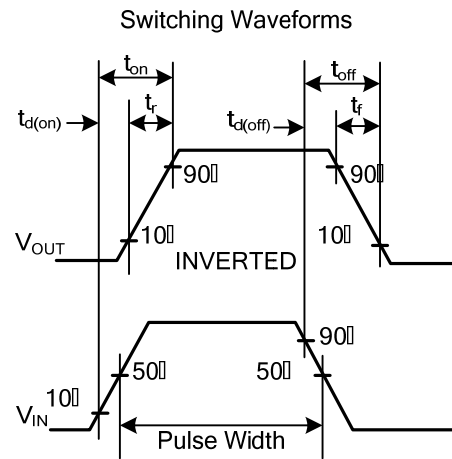
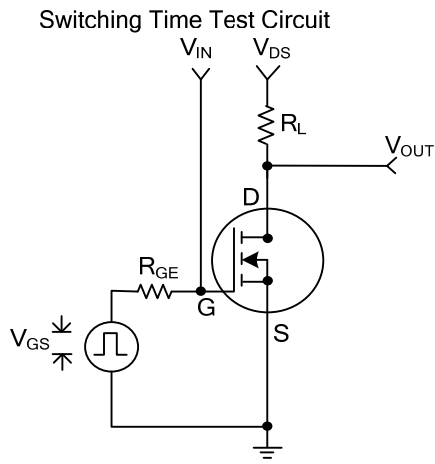
■ ELECTRICAL CHARACTERISTICS (T_J =25°C, unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0 V, I _D =250 μA	30			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =30 V, V _{GS} =0 V			1	μA
Gate-Source Leakage Current	I _{GSS}	V _{DS} =0 V, V _{GS} = ±20 V			±100	nA
ON CHARACTERISTICS(Note2)						
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250 μA	1		3	V
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =10 V, I _D =50 A		3.05	5.3	mΩ
		V _{GS} =4.5 V, I _D =40 A		4.2	8	
DYNAMIC PARAMETERS(Note3)						
Input Capacitance	C _{ISS}	V _{DS} =15V, V _{GS} =0V, f=1.0MHz		9500		pF
Output Capacitance	C _{OSS}			800		
Reverse Transfer Capacitance	C _{RSS}			300		
SWITCHING PARAMETERS(Note3)						
Total Gate Charge	Q _G	V _{DS} =15V, V _{GS} =5V, I _D =16A		50	65	nC
Gate Source Charge	Q _{GS}			20.8		
Gate Drain Charge	Q _{GD}			19		
Turn-ON Delay Time	t _{D(ON)}	V _{DD} =15V, I _D =1A, R _{GEN} =6Ω V _{GS} =10 V		25.7	50	ns
Turn-ON Rise Time	t _R			10	20	
Turn-OFF Delay Time	t _{D(OFF)}			128	200	
Turn-OFF Fall-Time	t _F			34	70	
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage	V _{SD}	I _S =20 A, V _{GS} =0 V			1.5	V
Drain-Source Diode Forward Current	I _S				90	A

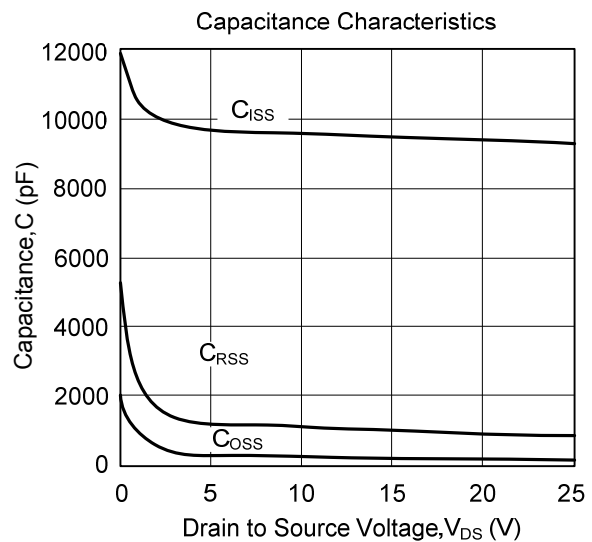
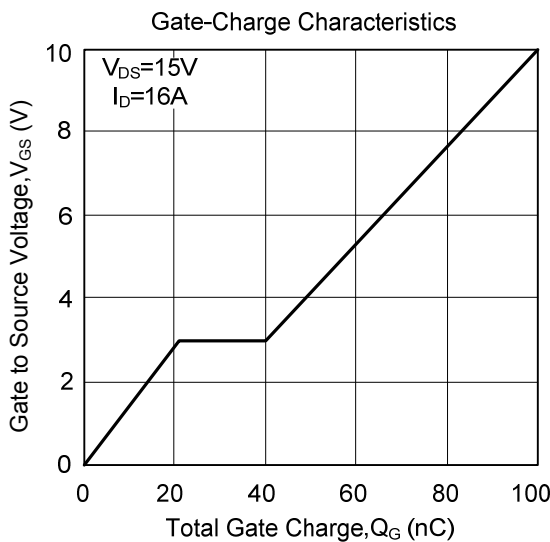
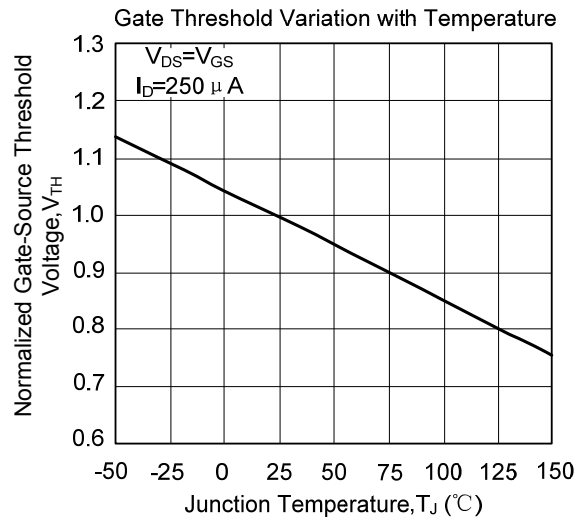
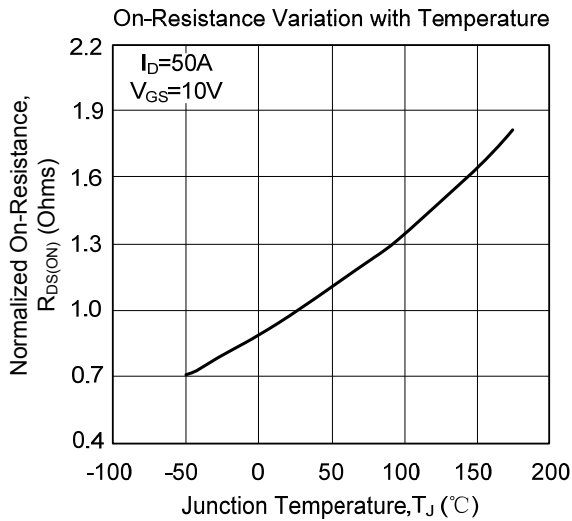
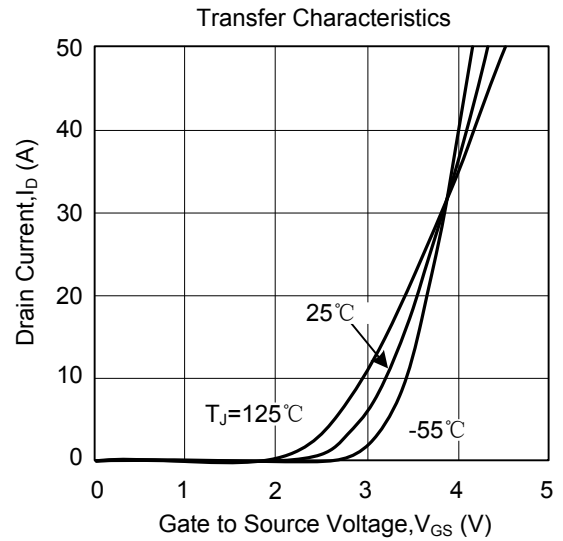
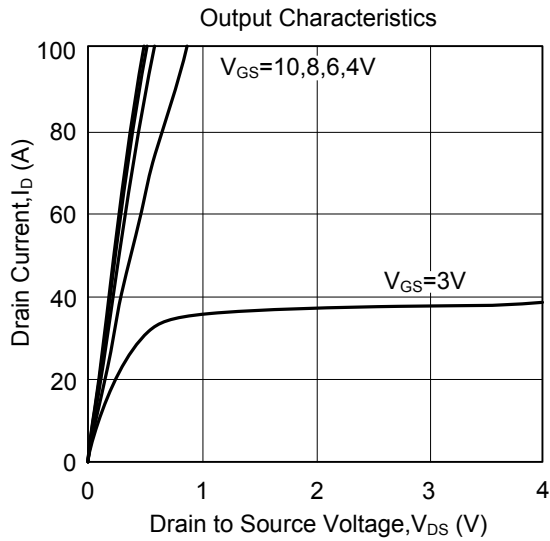
Notes: 1. Pulse Test : Pulse Width < 300μs, Duty Cycle < 2%.

2. Guaranteed by design, not subject to production testing.

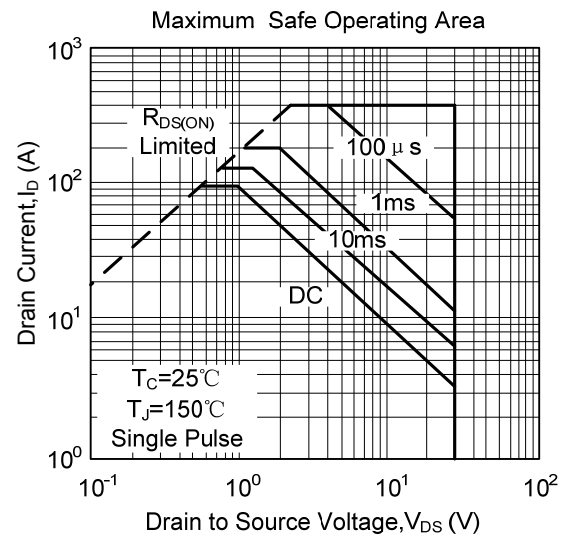
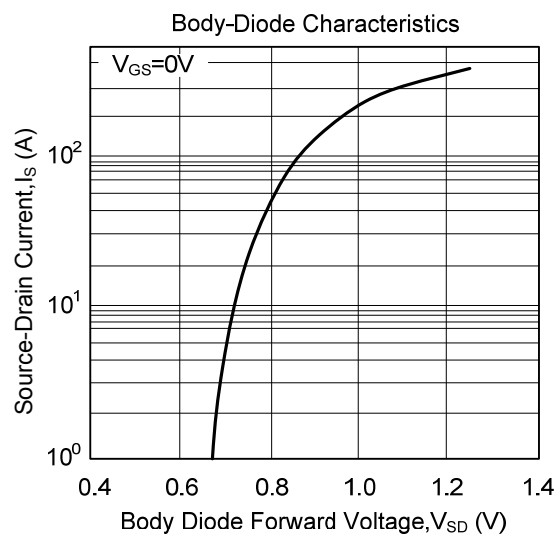
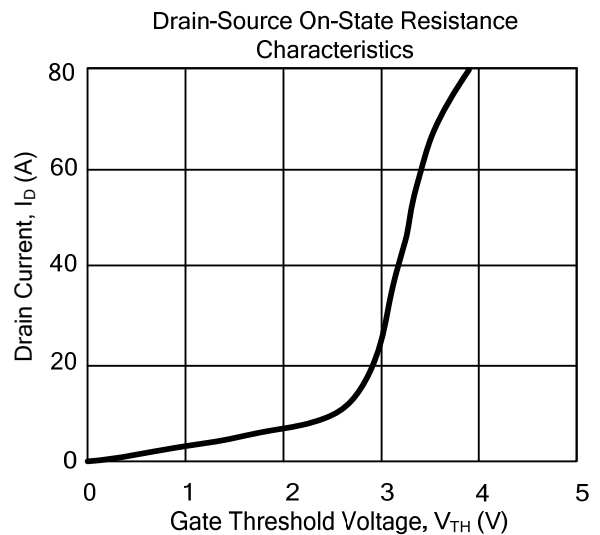
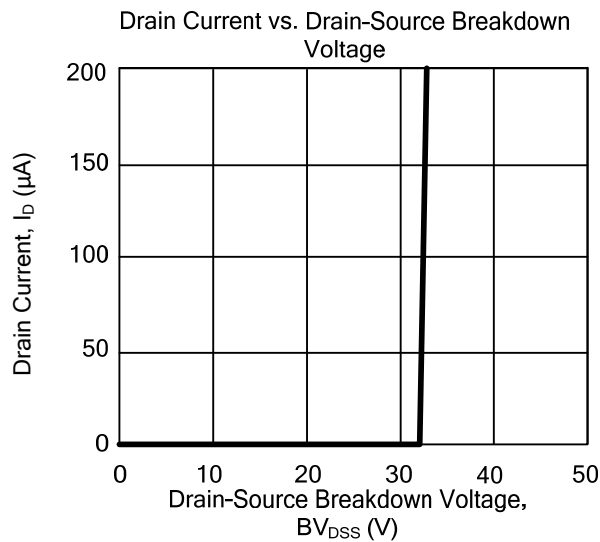
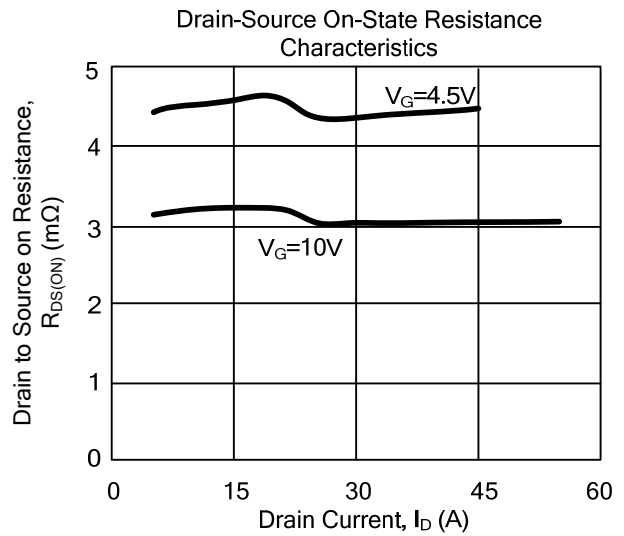
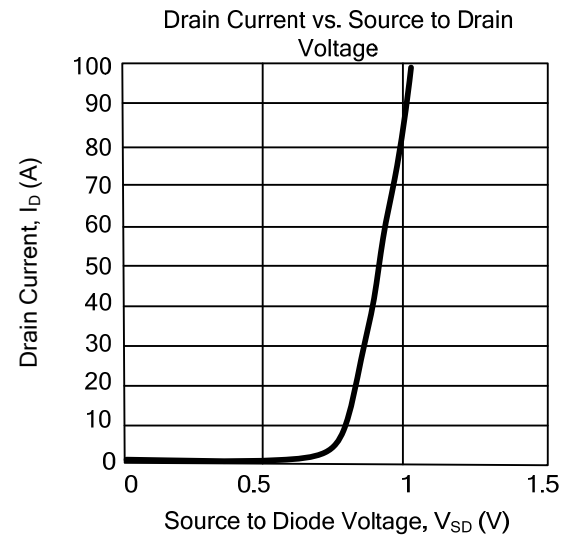
■ TEST CIRCUIT AND WAVEFORM



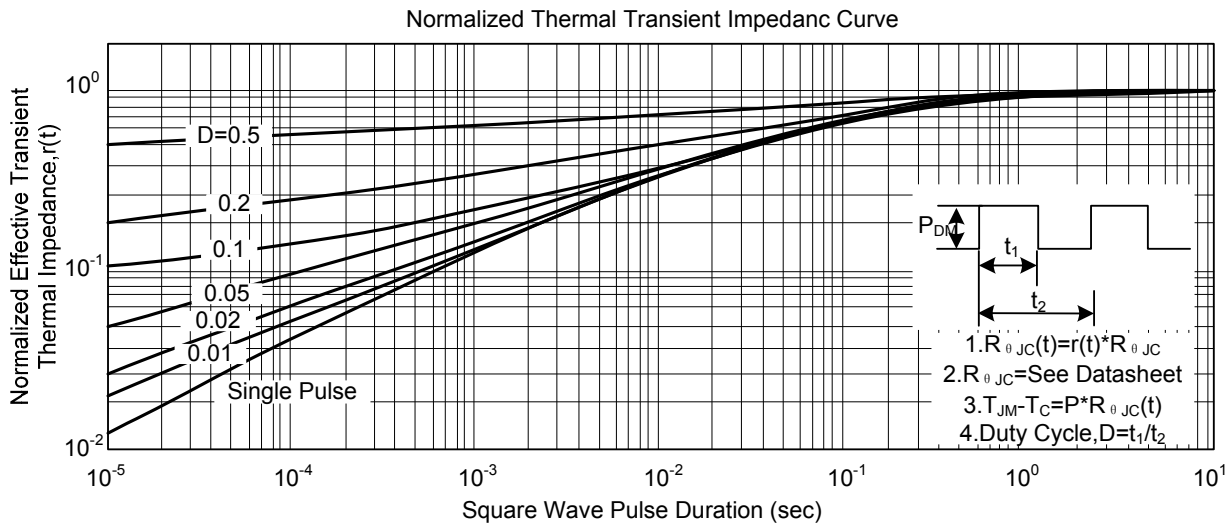
TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS(Cont.)



■ TYPICAL CHARACTERISTICS(Cont.)



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