



UT50N03

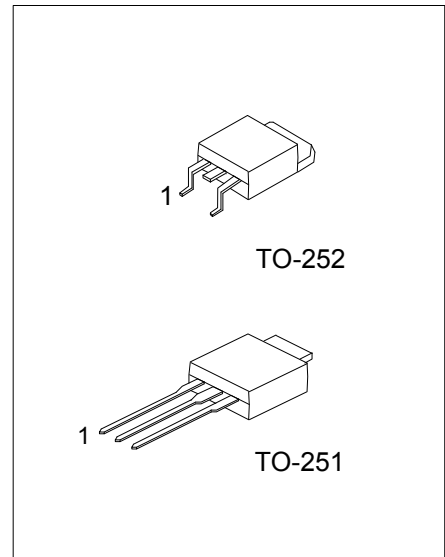
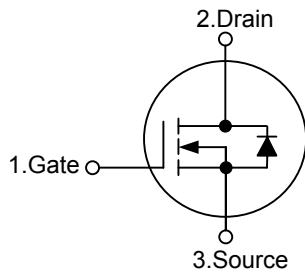
Power MOSFET

45A, 25V N-CHANNEL POWER MOSFET

FEATURES

- * $R_{DS(ON)} = 14m\Omega @ V_{GS} = 10V$
- * Low capacitance
- * Optimized gate charge
- * Fast switching capability
- * Avalanche energy specified

SYMBOL



ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UT50N03L-TM3-T	UT50N03G-TM3-T	TO-251	G	D	S	Tube
UT50N03L-TN3-R	UT50N03G-TN3-R	TO-252	G	D	S	Tape Reel
UT50N03L-TN3-T	UT50N03G-TN3-T	TO-252	G	D	S	Tube

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

<p>UT50N03L-TM3-T</p> <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Lead Free</p>	<p>(1) R: Tape Reel, T: Tube</p> <p>(2) TM3: TO-251, TN3: TO-252</p> <p>(3) G: Halogen Free, L: Lead Free</p>
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■ ABSOLUTE MAXIMUM RATINGS ($T_J = 25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	V_{DSS}	25	V
Gate-Source Voltage	V_{GSS}	± 20	V
Continuous Drain Current	I_D	45	A
Pulsed Drain Current (Note 3)	I_{DM}	180	A
Single Pulsed Avalanche Energy (Note 4)	E_{AS}	20	mJ
Power Dissipation	P_D	50	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. $L = 19.5\text{mH}$, $I_{AS} = 6.3\text{A}$, $V_{DD} = 50\text{V}$, $R_G = 25\ \Omega$, Starting $T_J = 25^\circ\text{C}$

3. Surface-mounted on FR4 board using 1 sq in pad, 1 oz Cu.

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient (Note 3)	θ_{JA}	71.4	$^\circ\text{C}/\text{W}$
Junction to Case	θ_{JC}	3.0	$^\circ\text{C}/\text{W}$

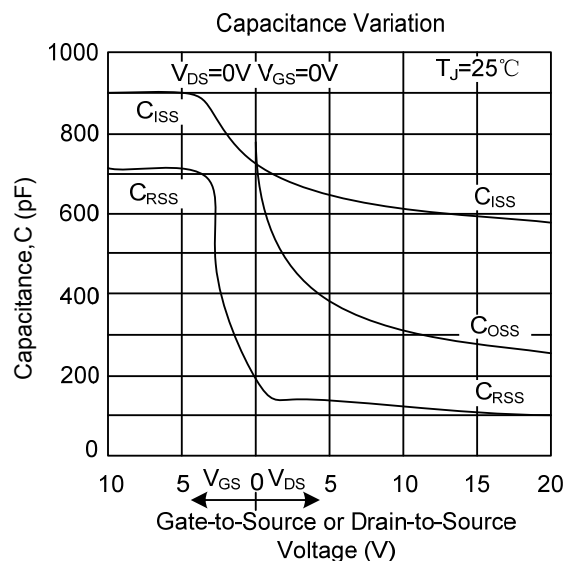
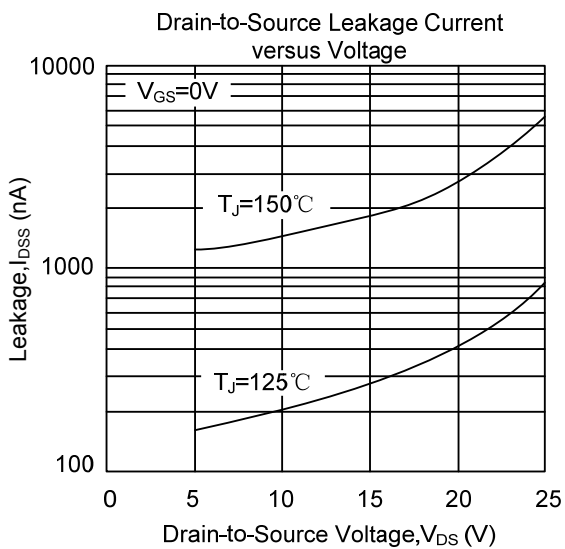
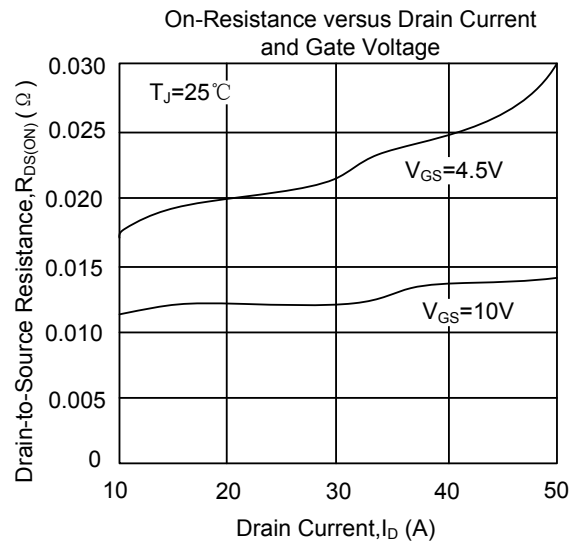
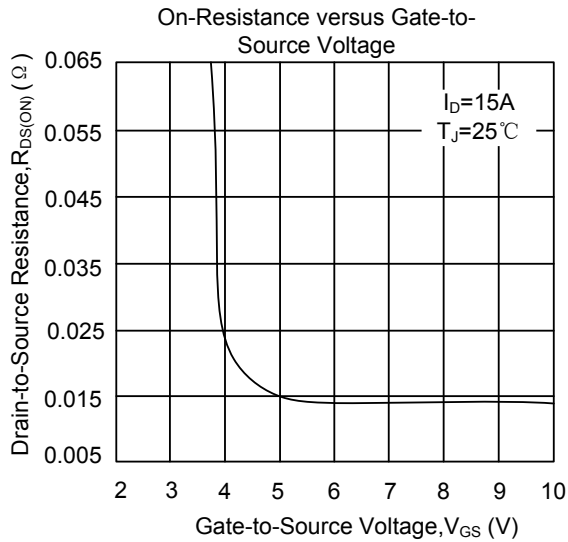
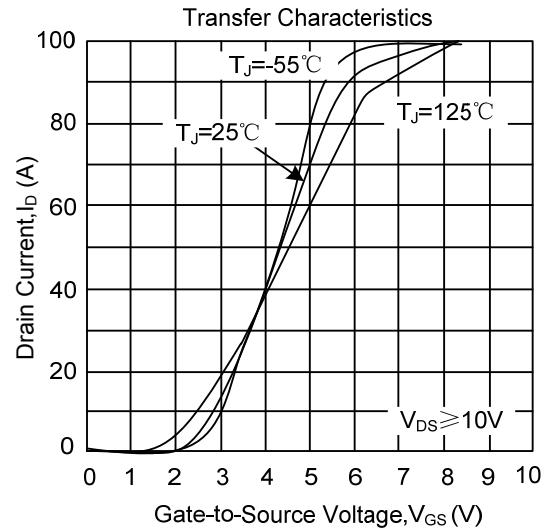
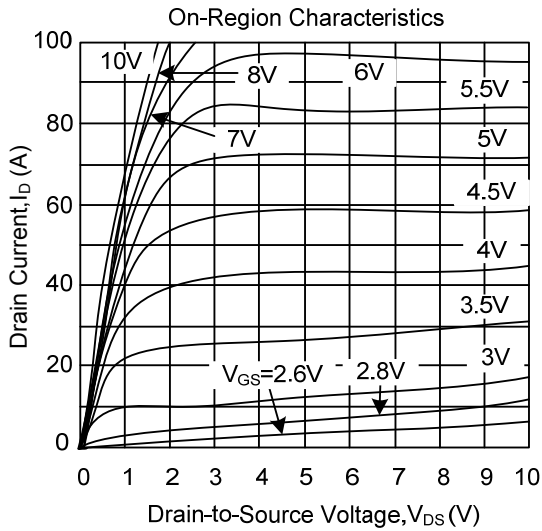
■ ELECTRICAL CHARACTERISTICS (T_J = 25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D = 250 μA	25			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} = 20V, V _{GS} = 0V			1.5	μA
Gate-Source Leakage Current	I _{GSS}	V _{DS} = 0V, V _{GS} = ±20V			±100	nA
ON CHARACTERISTICS						
Gate-Threshold Voltage	V _{GS(TH)}	V _{DS} = V _{GS} , I _D = 250 μA	1.0	1.7	2.0	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} = 11.5V	I _D = 30 A	12		mΩ
			I _D = 15 A	11.7		
		V _{GS} = 10 V	I _D = 30 A	12.5	14	
		V _{GS} = 4.5V	I _D = 30 A	21		
		I _D = 15 A	19	23		
DYNAMIC PARAMETERS						
Input Capacitance	C _{ISS}	V _{DS} = 12V, V _{GS} = 0V, f = 1MHz		610	750	pF
Output Capacitance	C _{OSS}			300		
Reverse Transfer Capacitance	C _{RSS}			125		
SWITCHING PARAMETERS						
Turn-ON Delay Time	t _{D(ON)}	V _{GS} = 4.5 V, V _{DS} = 15 V, I _D = 30 A, R _G = 3.0 Ω		8.2		ns
Turn-ON Rise Time	t _R			9.6		
Turn-OFF Delay Time	t _{D(OFF)}			11.2		
Turn-OFF Fall-Time	t _F			6.8		
Turn-ON Delay Time	t _{D(ON)}	V _{GS} = 11.5 V, V _{DS} = 15 V, I _D = 30 A, R _G = 3.0 Ω		5.0		ns
Turn-ON Rise Time	t _R			84		
Turn-OFF Delay Time	t _{D(OFF)}			15		
Turn-OFF Fall-Time	t _F			4.0		
Total Gate Charge	Q _G	V _{DS} = 15V, V _{GS} = 4.5V, I _D = 30 A		6.0	10	nC
Gate-to-Source Charge	Q _{GS}			1.9		
Gate-to-Drain Charge	Q _{GD}			3.7		
Total Gate Charge	Q _G	V _{DS} = 15V, V _{GS} = 11.5V, I _D = 30 A		15		nC
Gate-to-Source Charge	Q _{GS}			1.9		
Gate-to-Drain Charge	Q _{GD}			3.9		
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage	V _{SD}	I _S = 30 A, V _{GS} = 0V		0.85	1.1	V
Maximum Continuous Drain-Source Diode Forward Current	I _S				45	A
Reverse Recovery Time	t _{rr}	I _S = 30 A, V _{GS} = 0 V,		24		ns
Reverse Recovery Charge	Q _{RR}	dI /dt = 100 A/μs		14		nC

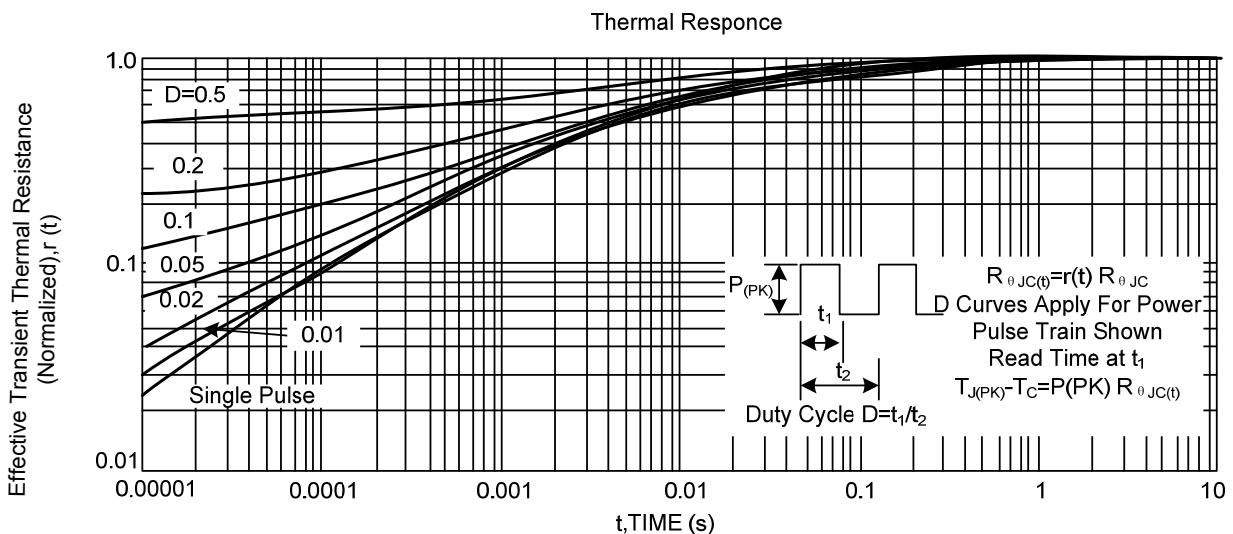
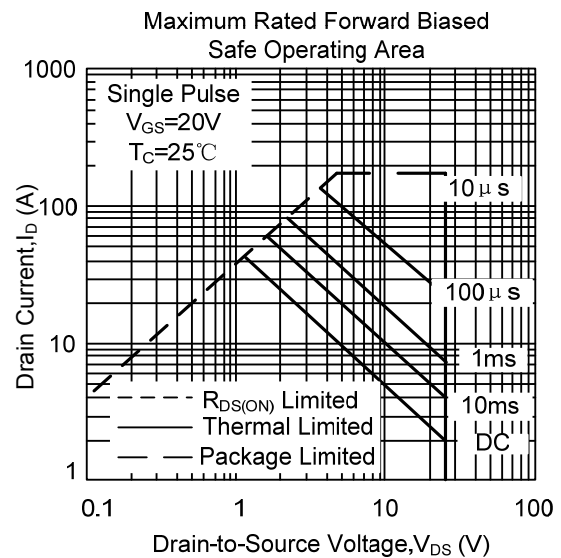
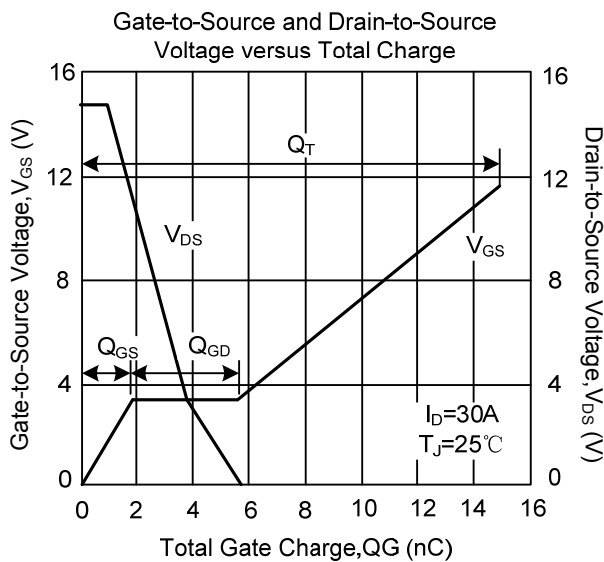
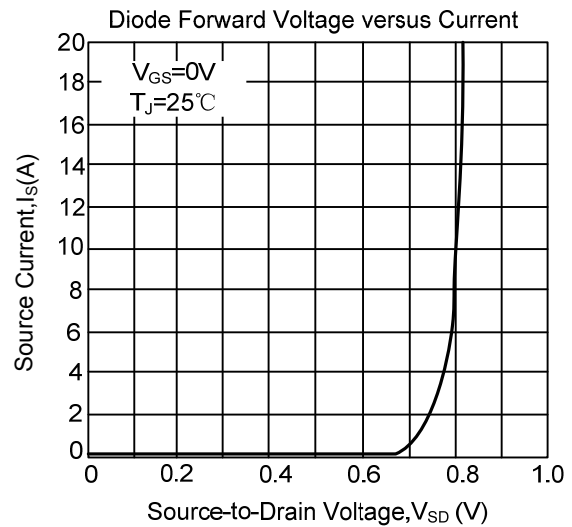
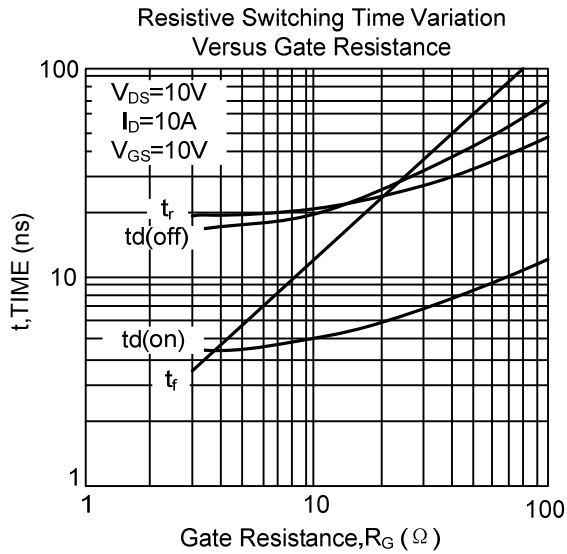
Note: 1. Pulse width limited by T_{J(MAX)}

2. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2%.

TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS(Cont.)



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