

UT50N03

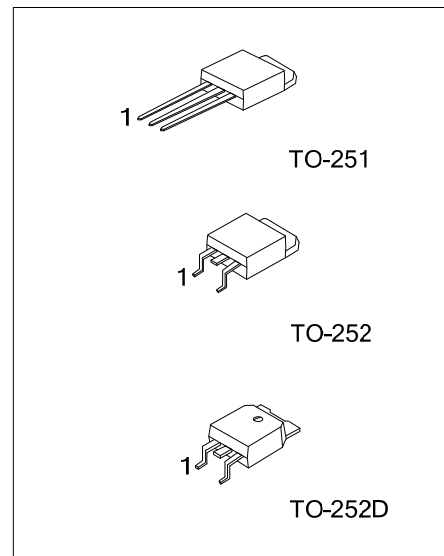
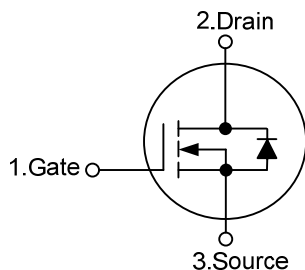
Power MOSFET

50A, 30V N-CHANNEL POWER MOSFET

■ FEATURES

- * $R_{DS(ON)} < 14\text{ m}\Omega$ @ $V_{GS} = 10\text{ V}$, $I_D = 30\text{ A}$
- * Low capacitance
- * Optimized gate charge
- * Fast switching capability
- * Avalanche energy specified

■ SYMBOL



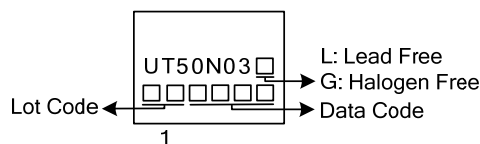
■ ORDERING INFORMATION

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-TND-R	UT50N03G-TND-R	TO-252D	G	D	S	Tape Reel

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)Green Package</p>	<p>(1) T: Tube, R: Tape Reel</p> <p>(2) TM3: TO-251, TN3: TO-252, TND: TO-252D</p> <p>(3) L: Lead Free, G: Halogen Free and Lead Free</p>
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■ MARKING



■ ABSOLUTE MAXIMUM RATINGS ($T_J = 25^\circ\text{C}$, 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	50	A
Pulsed Drain Current (Note 2)	I_{DM}	180	A
Single Pulsed Avalanche Energy (Note 3)	E_{AS}	45	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. Repetitive Rating: Pulse width limited by maximum junction temperature.

3. $L = 0.1\text{mH}$, $I_{AS} = 30\text{A}$, $V_{DD} = 50\text{V}$, $R_G = 25\ \Omega$, Starting $T_J = 25^\circ\text{C}$.

■ THERMAL DATA

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

Note: Surface-mounted on FR4 board using 1 sq in pad, 1 oz Cu

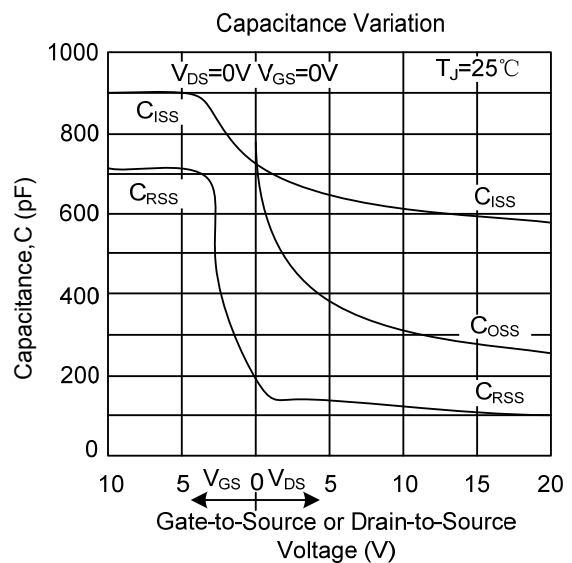
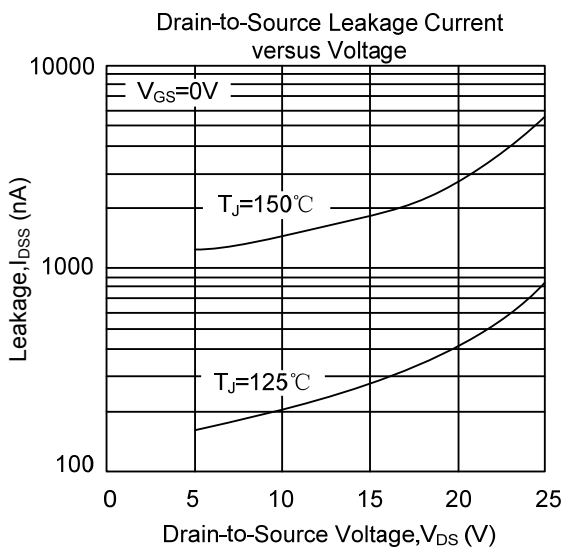
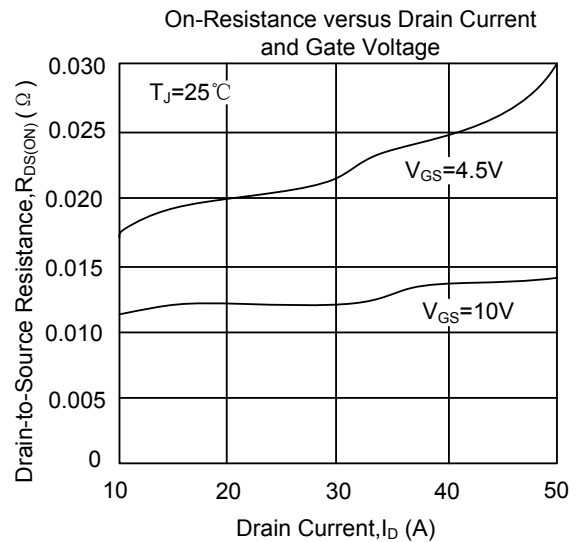
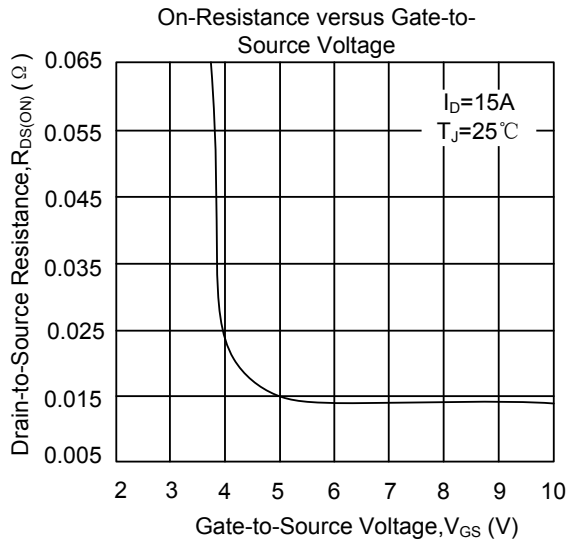
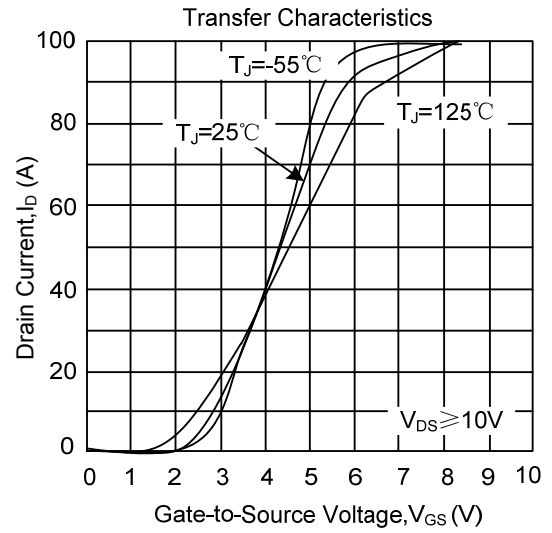
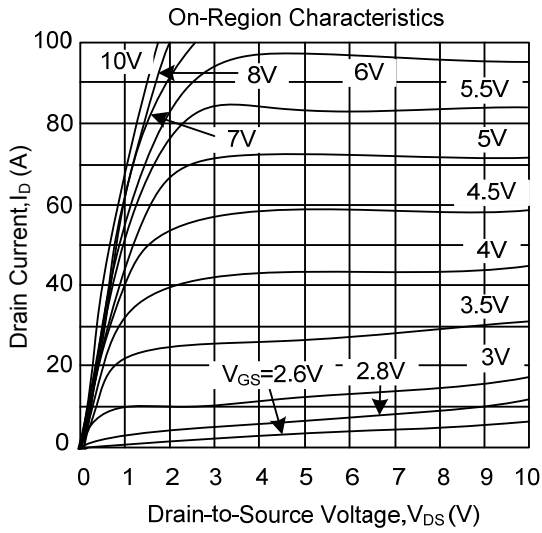
■ ELECTRICAL CHARACTERISTICS ($T_J = 25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_D = 250 \mu A$	30			V	
Drain-Source Leakage Current	I_{DSS}	$V_{DS} = 20V, V_{GS} = 0V$			1.5	μA	
Gate-Source Leakage Current	I_{GSS}	$V_{DS} = 0V, V_{GS} = \pm 20V$			± 100	nA	
ON CHARACTERISTICS							
Gate-Threshold Voltage	$V_{GS(TH)}$	$V_{DS} = V_{GS}, I_D = 250 \mu A$	1.0	1.7	2.0	V	
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS} = 11.5V$	$I_D = 30 A$		12		m Ω
			$I_D = 15 A$		11.7		m Ω
		$V_{GS} = 10 V$	$I_D = 30 A$		12.5	14	m Ω
			$I_D = 15 A$		21	23	m Ω
DYNAMIC PARAMETERS							
Input Capacitance	C_{ISS}	$V_{DS} = 12V, V_{GS} = 0V, f = 1MHz$		610	750	pF	
Output Capacitance	C_{OSS}			300		pF	
Reverse Transfer Capacitance	C_{RSS}			125		pF	
SWITCHING PARAMETERS							
Turn-ON Delay Time	$t_{D(ON)}$	$V_{GS} = 4.5 V, V_{DS} = 15 V, I_D = 30 A, R_G = 3.0\Omega$		8.2		ns	
Turn-ON Rise Time	t_R			9.6		ns	
Turn-OFF Delay Time	$t_{D(OFF)}$			11.2		ns	
Turn-OFF Fall-Time	t_F			6.8		ns	
Turn-ON Delay Time	$t_{D(ON)}$	$V_{GS} = 11.5 V, V_{DS} = 15 V, I_D = 30 A, R_G = 3.0\Omega$		5.0		ns	
Turn-ON Rise Time	t_R			84		ns	
Turn-OFF Delay Time	$t_{D(OFF)}$			15		ns	
Turn-OFF Fall-Time	t_F			4.0		ns	
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		nC	
Gate-to-Drain Charge	Q_{GD}			3.7		nC	
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		nC	
Gate-to-Drain Charge	Q_{GD}			3.9		nC	
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}	$di/dt = 100 A/\mu s$		14		nC	

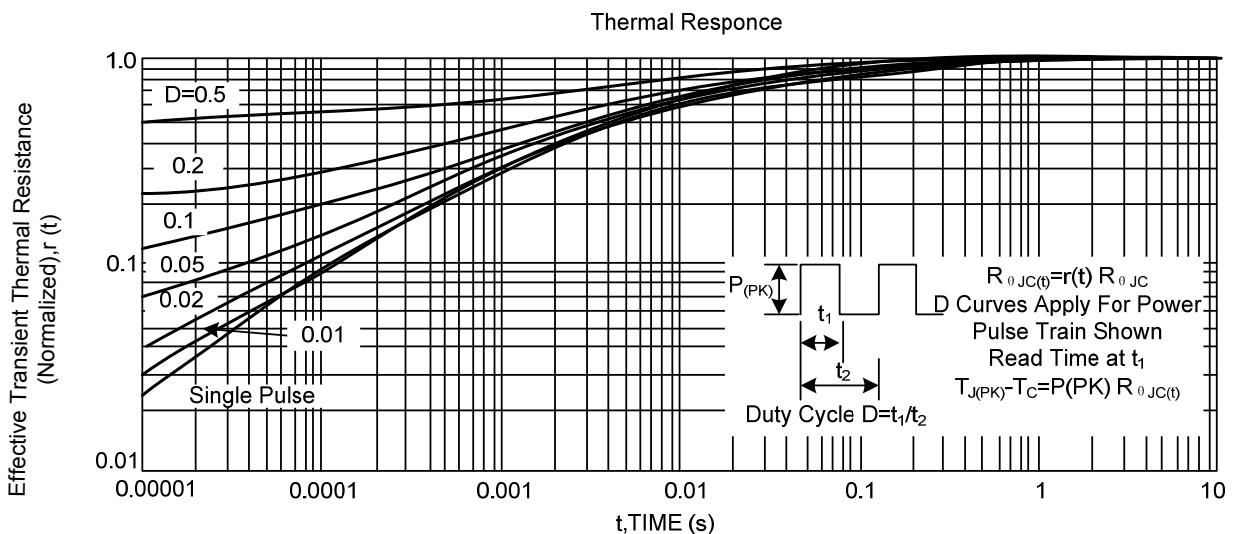
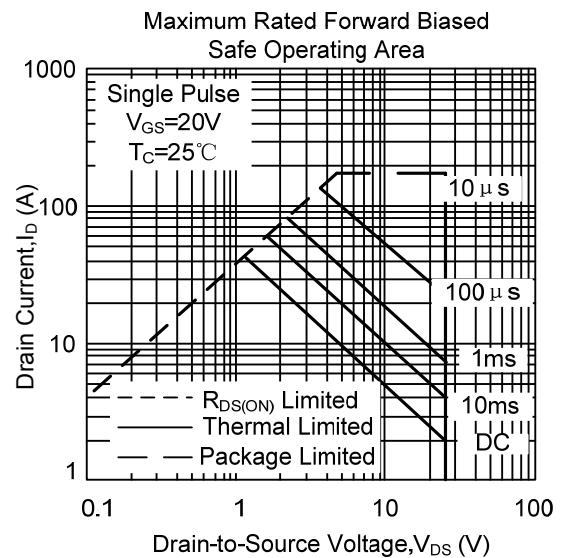
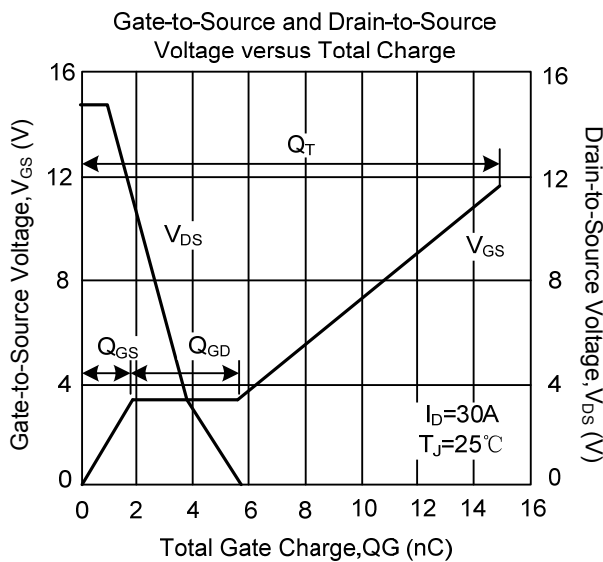
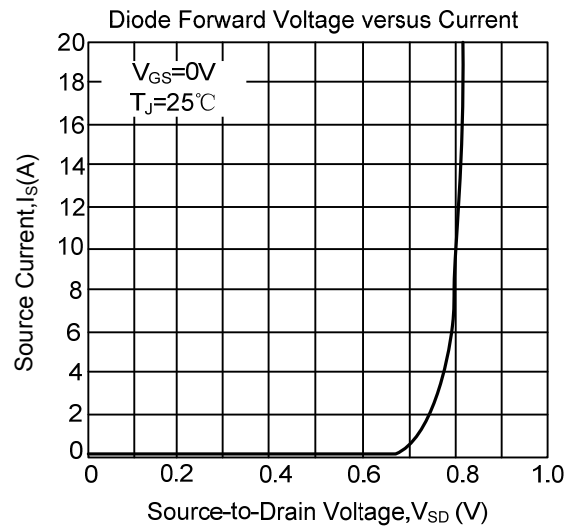
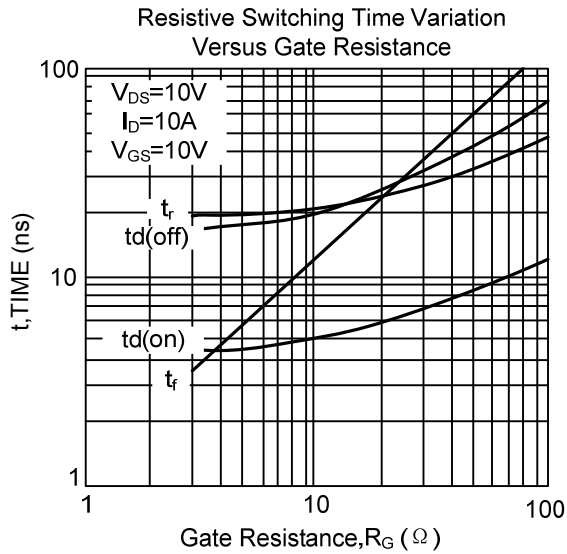
Notes: 1. Pulse width limited by $T_{J(MAX)}$

2. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycles $\leq 2\%$

TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS(Cont.)



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