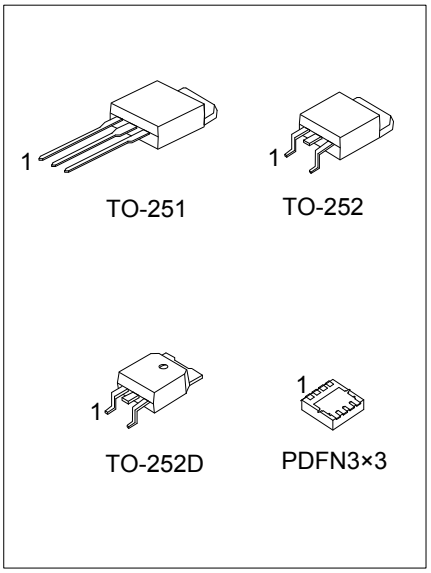
UT50N03

Power MOSFET

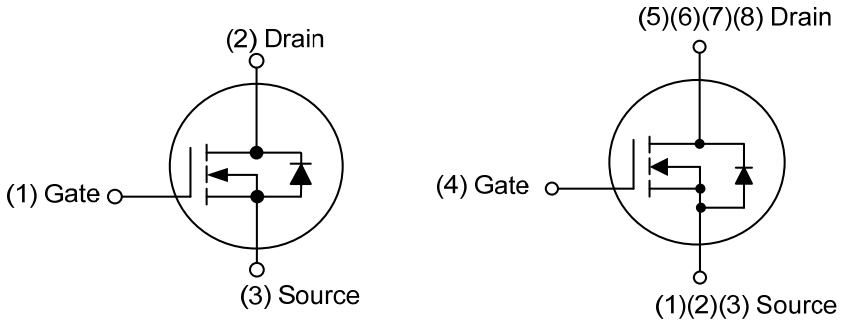
50A, 30V N-CHANNEL POWER MOSFET



■ FEATURES

* $R_{DS(ON)}$ ≤ 14 mΩ @ V_{GS}=10V, I_D=30A
* Low capacitance
* Optimized gate charge
* Fast switching capability
* Avalanche energy specified

■ SYMBOL



TO-251 / TO-252 / TO-252D　　PDFN3×3

■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
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
UT50N03L-P3030-R	UT50N03G-P3030-R	PDFN3×3	S	S	S	G	D	D	D	D	Tape Reel

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

UT50N03G-TM3-T
(1)Packing Type
(2)Package Type
(3)Green Package

(1) T: Tube, R: Tape Reel
(2) TM3: TO-251, TN3: TO-252,
TND: TO-252D, P3030: PDFN3×3
(3) G: Halogen Free and Lead Free, L: Lead Free

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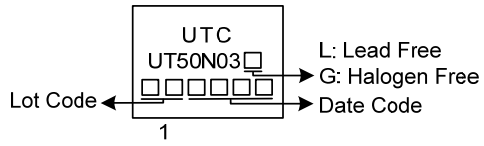
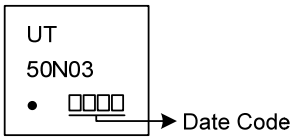
■ MARKING

TO-251 / TO-252 / TO-252D	PDFN3×3
	

■ ABSOLUTE MAXIMUM RATINGS (T_J = 25°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	TO-251/TO-252 TO-252D	I_D	50	A
	PDFN3×3		30	
Pulsed Drain Current (Note 2)		I_{DM}	100	A
Single Pulsed Avalanche Energy (Note 3)		E_{AS}	66	mJ
Power Dissipation	TO-251/TO-252 TO-252D	P_D	40	W
	PDFN3×3		24	W
Junction Temperature		T_J	+150	°C
Storage Temperature		T_{STG}	-55 ~ +150	°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 = 0.05mH, I_{AS} = 51A, V_{DD} = 25V, R_G = 25 Ω, Starting T_J = 25°C.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient (Note 3)	TO-251/TO-252 TO-252D	θ_{JA}	50	°C/W
	PDFN3×3		60	°C/W
Junction to Case	TO-251/TO-252 TO-252D	θ_{JC}	3.13	°C/W
	PDFN3×3		5.2	°C/W

Note: Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

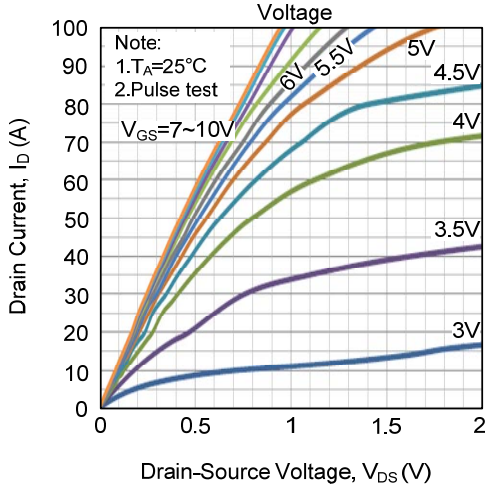
■ ELECTRICAL CHARACTERISTICS (T_J=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250μA	30			V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=30V, 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=250μA	1.0	1.7	2.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=25A			10	mΩ
		V_{GS}=4.5V, I_D=25A			15	mΩ
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	V_{DS}=15V, V_{GS}=0V, f=1MHz		940		pF
Output Capacitance	C_{OSS}			235		pF
Reverse Transfer Capacitance	C_{RSS}			200		pF
SWITCHING PARAMETERS						
Total Gate Charge	Q_G	V_{DS}=24V, V_{GS}=10V, I_D=50A		43		nC
Gate-to-Source Charge	Q_{GS}			6		nC
Gate-to-Drain Charge	Q_{GD}			16		nC
Turn-ON Delay Time	$t_{D(ON)}$	V_{GS}=10V, V_{DS}=15V, I_D=50A, R_G=3Ω		8		ns
Turn-ON Rise Time	t_R			17		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			25		ns
Turn-OFF Fall-Time	t_F			23		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Continuous Drain-Source Diode Forward Current	I_S				45	A
Drain-Source Diode Forward Voltage	V_{SD}	I_S=50A,V_{GS}=0V			1.4	V
Reverse Recovery Time	t_{rr}	I_S=30A,V_{GS}=0V, dI/dt=100A/μs		164		ns
Reverse Recovery Charge	Q_{rr}			300		nC

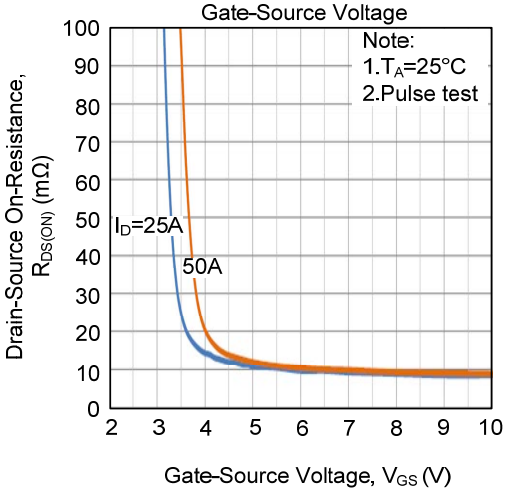
Notes: 1. Pulse width limited by $T_{J(MAX)}$
2. Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%

■ TYPICAL CHARACTERISTICS

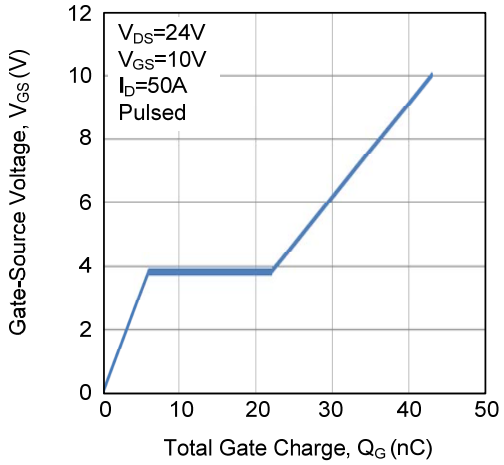
Drain Current vs. Drain-Source Voltage



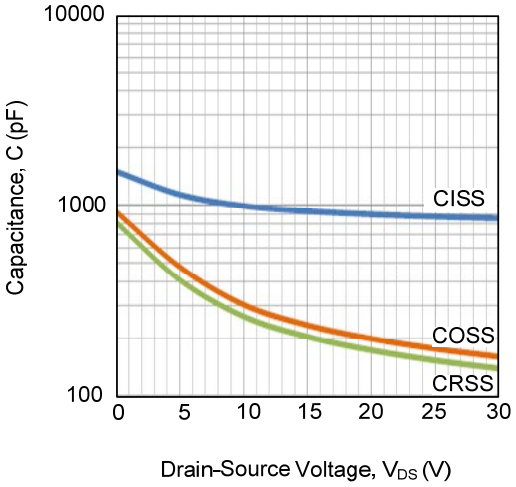
Drain-Source On-Resistance vs. Gate-Source Voltage



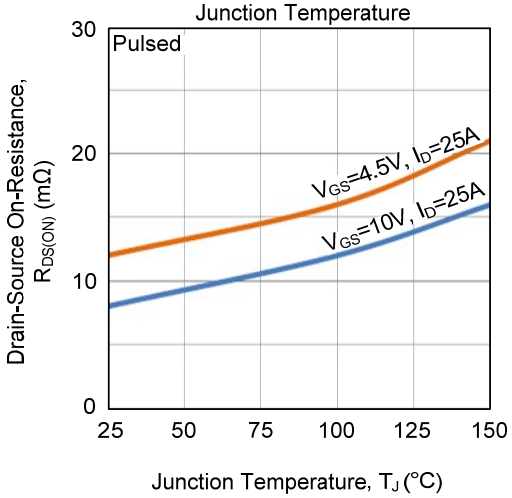
Gate Charge Characteristics



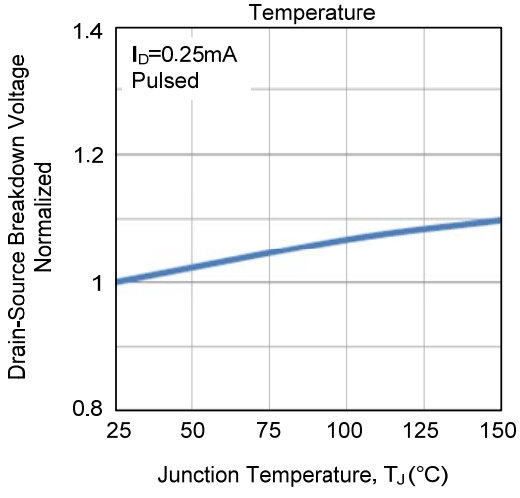
Capacitance Characteristics



Drain-Source On-Resistance vs. Junction Temperature

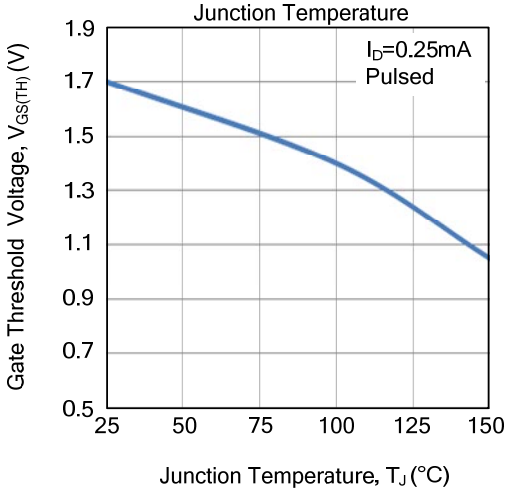


Breakdown Voltage vs. Junction Temperature

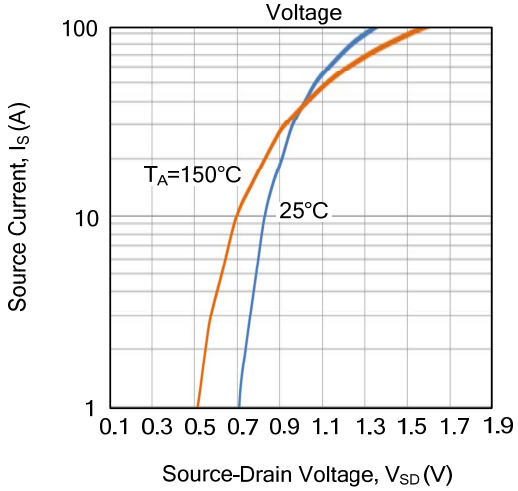


■ TYPICAL CHARACTERISTICS (Cont.)

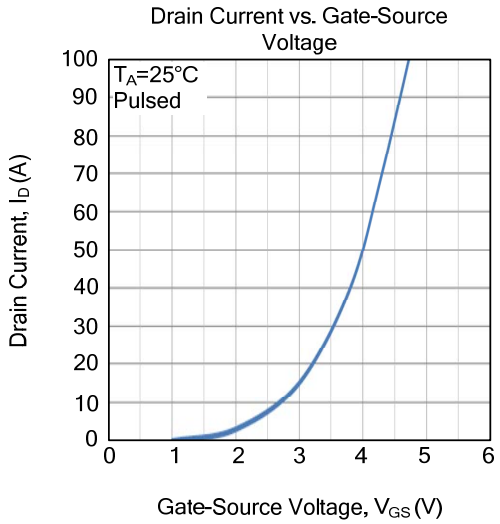
Gate Threshold Voltage vs. Junction Temperature



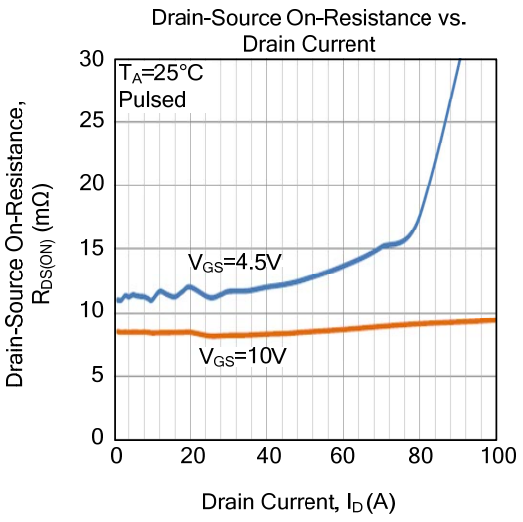
Source Current vs. Source-Drain Voltage



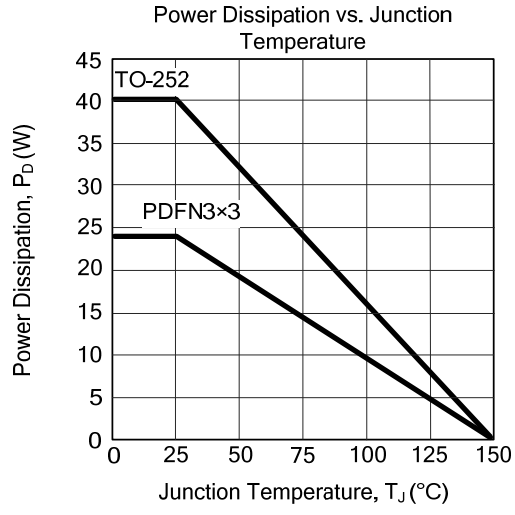
Drain Current vs. Gate-Source Voltage



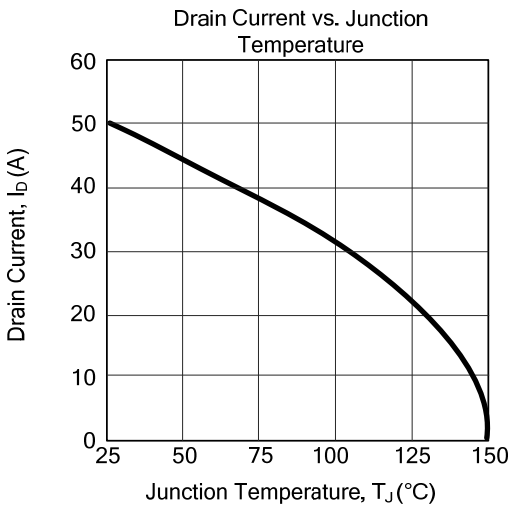
Drain-Source On-Resistance vs. Drain Current



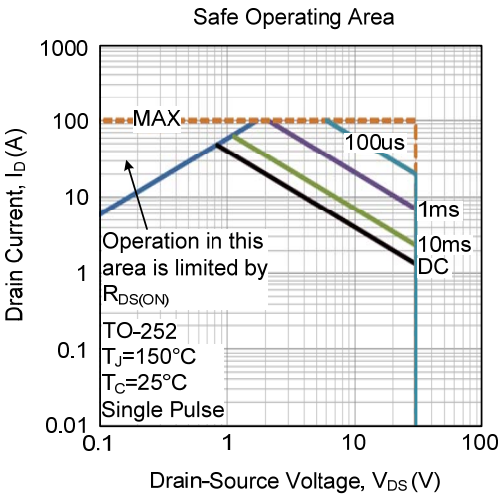
Power Dissipation vs. Junction Temperature

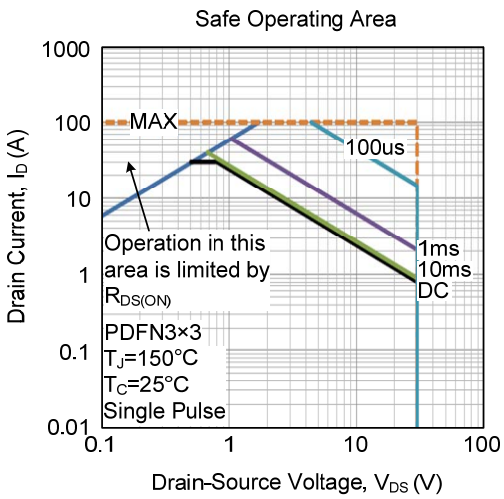


Drain Current vs. Junction Temperature



■ TYPICAL CHARACTERISTICS (Cont.)





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