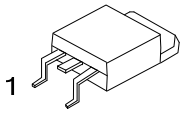
UTD408

Power MOSFET

N-CHANNEL ENHANCEMENT MODE



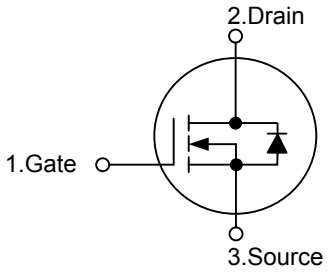
TO-252

DFN3030-8

■ FEATURES

* $R_{DS(ON)}$ < 18 mΩ @ V_{GS} =10V, I_D =18A
  $R_{DS(ON)}$ < 27 mΩ @ V_{GS} =4.5V, I_D =10A
* Low capacitance
* Optimized gate charge
* Fast switching capability
* Avalanche energy specified

■ SYMBOL



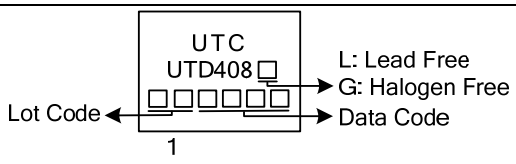
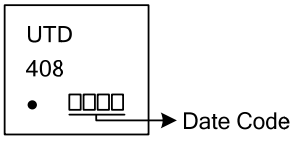
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UTD408L-TN3-R	UTD408G-TN3-R	TO-252	G	D	S	-	-	-	-	-	Tape Reel
UTD408L-K08-3030-R	UTD408G-K08-3030-R	DFN3030-8	S	S	S	G	D	D	D	D	Tape Reel

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

UTD408G-TN3-R (1)Packing Type (2)Package Type (3)Green Package	(1) R: Tape Reel (2) TN3: TO-252, K08-3030: DFN3030-8 (3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING

TO-252	DFN3030-8
	

■ ABSOLUTE MAXIMUM RATINGS (T_A = 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 (T_C=25°C) (Note 4)			I_D	18	A
Pulsed Drain Current (Note 3)			I_{DM}	40	A
Avalanche Current (Note 3)			I_{AR}	18	A
Repetitive Avalanche Energy (L=0.1mH) (Note 3)			E_{AR}	40	mJ
Power Dissipation	TO-252	T_A=25°C (Note 1)	P_D	2.5	W
	DFN3030-8			1.5	W
	TO-252	T_C=25°C (Note 2)		60	W
	DFN3030-8			36	W
Junction Temperature			T_J	+150	°C
Strong Temperature			T_{STG}	-55 ~ +150	°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 DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient (Note 1)	TO-252	θ_{JA}	50	°C/W
	DFN3030-8		65	°C/W
Junction to Case (Note 3)	TO-252	θ_{JC}	2.08	°C/W
	DFN3030-8		3.5	°C/W

Notes: 1.The value of R θ_{JA} is measured with the device mounted on 1in^2 FR-4 board with 2oz. Copper, and the maximum temperature of 150°C may be used if the PCB or heat-sink allows it.

2. The power dissipation P_D is based on $T_{J(MAX)}$= 150°C, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heat-sinking is used.
3. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$= 150°C.
4. The maximum current rating is limited by bond-wires.

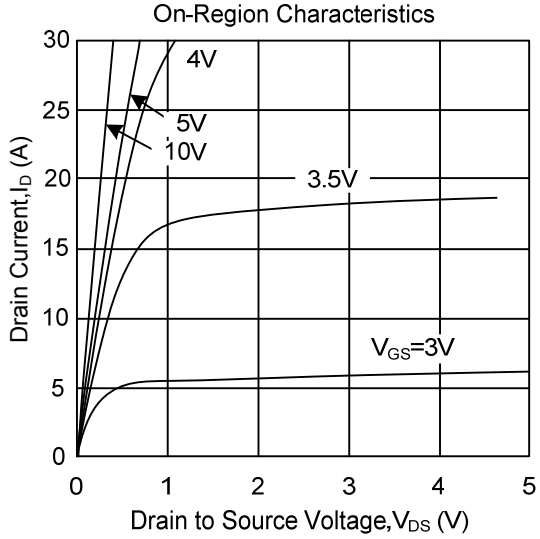
■ ELECTRICAL CHARACTERISTICS (T_J =25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} =0 V, I_D =250μA	30			V
Drain-Source Leakage Current	I_{DSS}	V_{DS} =24V, V_{GS} =0 V			1	μA
Gate-Body Leakage Current	I_{GSS}	V_{DS} =0 V, V_{GS} = ±20V			100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS} =V_{GS}, I_D =250 μA	1	1.8	2.5	V
On State Drain Current	$I_{D(ON)}$	V_{DS} =5V, V_{GS} =4.5V	40			A
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS} =10V, I_D =18A		13.6	18	mΩ
		V_{GS} =4.5V, I_D =10A		20.6	27	mΩ
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	V_{DS} =15 V, V_{GS} =0V, f=1MHz		1040	1250	pF
Output Capacitance	C_{OSS}			180		pF
Reverse Transfer Capacitance	C_{RSS}			110		pF
SWITCHING PARAMETERS						
Total Gate Charge	Q_G	V_{DS} =15V, V_{GS} =10V, I_D =18A		19.8	25	nC
Gate Source Charge	Q_{GS}			2.5		nC
Gate Drain Charge	Q_{GD}			3.5		nC
Turn-ON Delay Time	$t_{D(ON)}$	V_{GS}=10V,V_{DS}=15V,R_L=0.82Ω, R_{GEN} =3Ω		4.5		ns
Turn-ON Rise Time	t_R			3.9		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			17.4		ns
Turn-OFF Fall-Time	t_F			3.2		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Continuous Drain-Source Diode Forward Current	I_S				18	A
Drain-Source Diode Forward Voltage	V_{SD}	I_S=1A,V_{GS}=0V		0.75	1	V
Body Diode Reverse Recovery Time	t_{rr}	I_F=18 A, dI/dt=100A/μs		19	25	ns
Body Diode Reverse Recovery Charge	Q_{rr}	I_F=18 A, dI/dt=100A/μs		8		nC

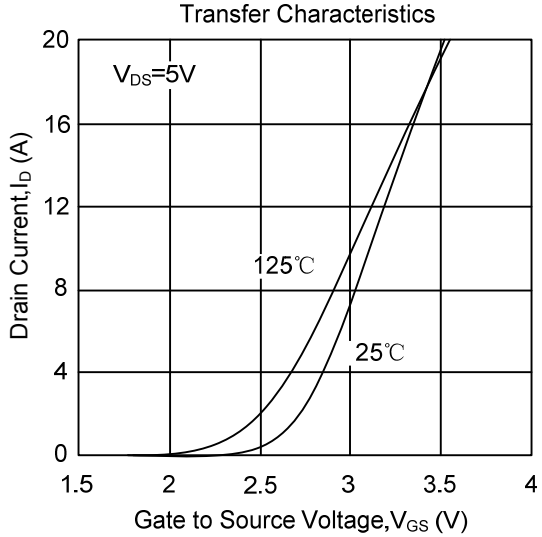
Notes: 5. Pulse width limited by $T_{J(MAX)}$
6. Pulse width ≤300us, duty cycle ≤2%.

■ TYPICAL CHARACTERISTICS

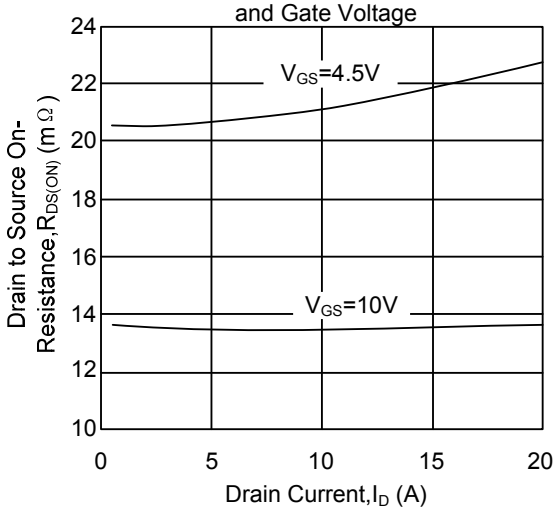
On-Region Characteristics



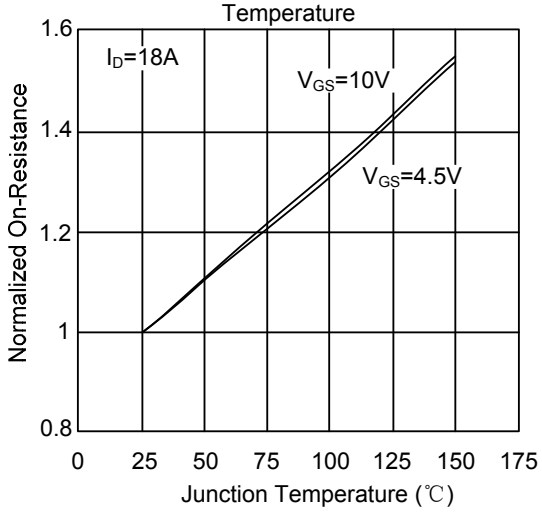
Transfer Characteristics



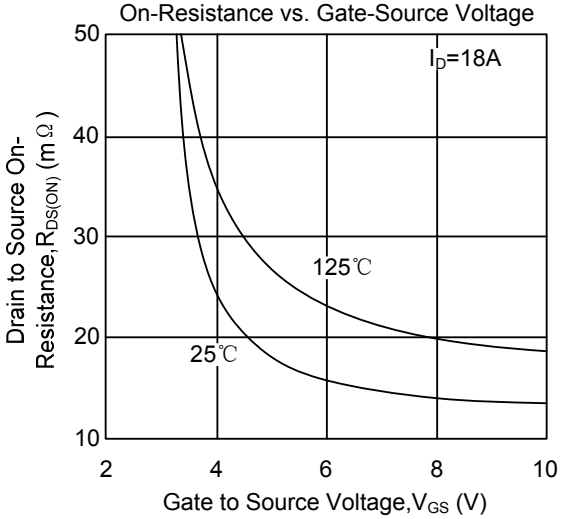
On-Resistance vs. Drain Current and Gate Voltage



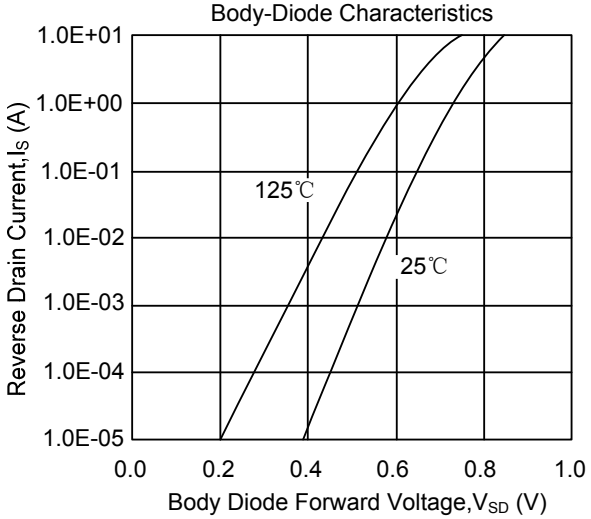
On-Resistance vs. Junction Temperature



On-Resistance vs. Gate-Source Voltage

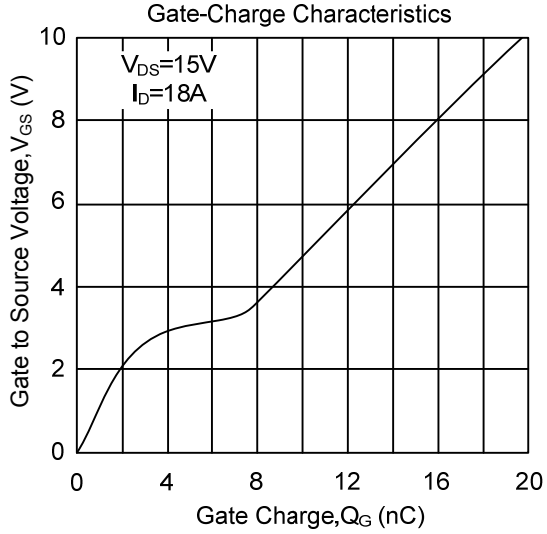


Body-Diode Characteristics

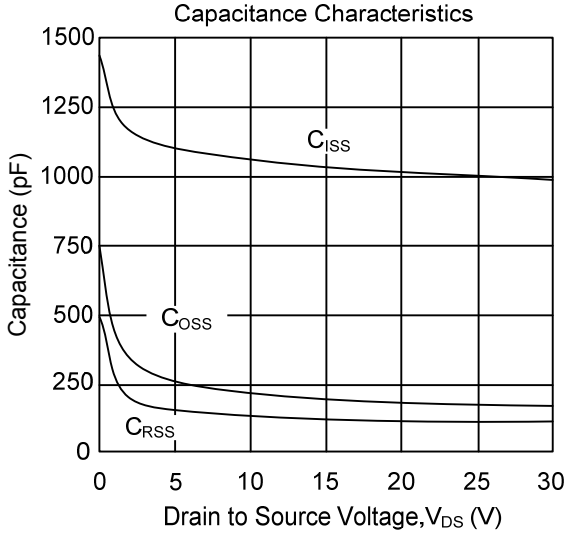


■ TYPICAL CHARACTERISTICS (Cont.)

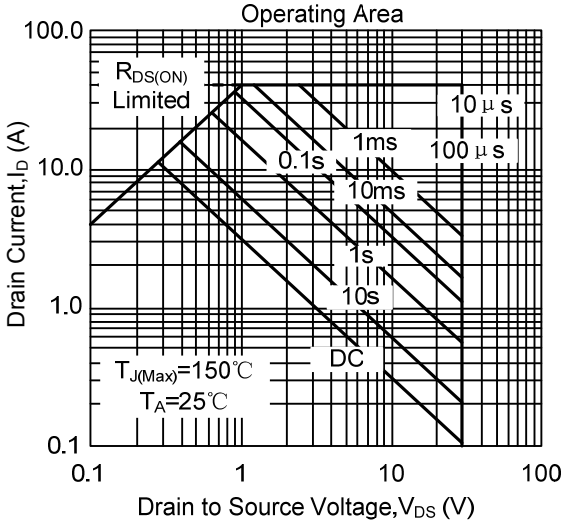
Gate-Charge Characteristics



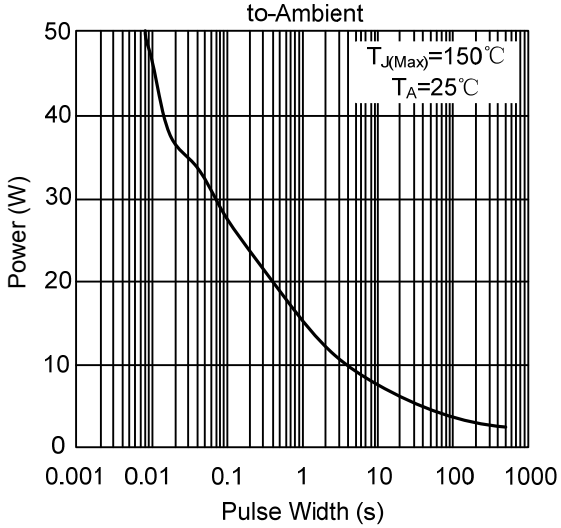
Capacitance Characteristics



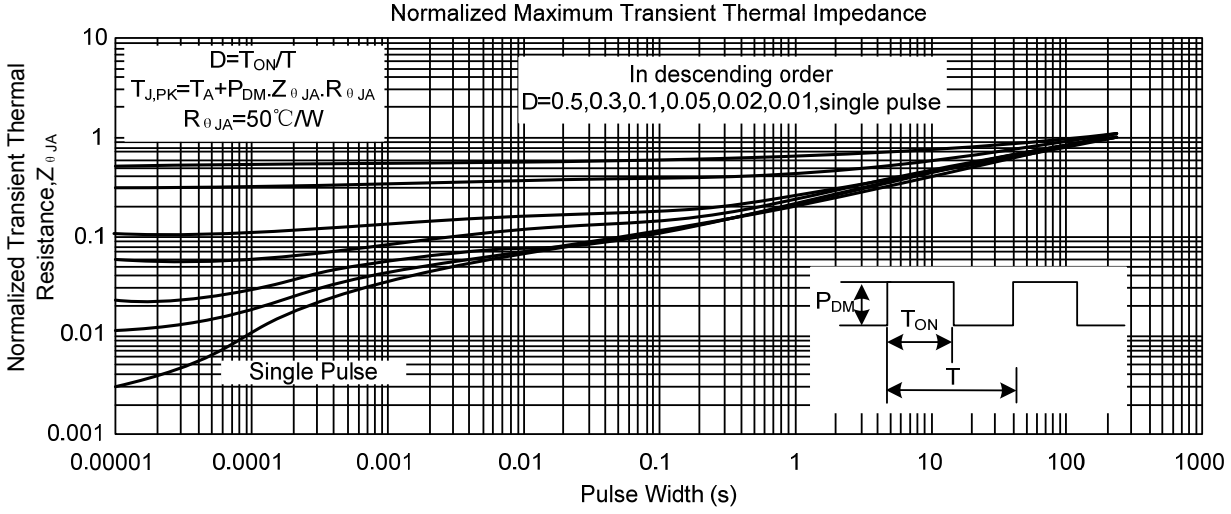
Maximum Forward Biased Safe Operating Area



Single Pulse Power Rating Junction-to-Ambient

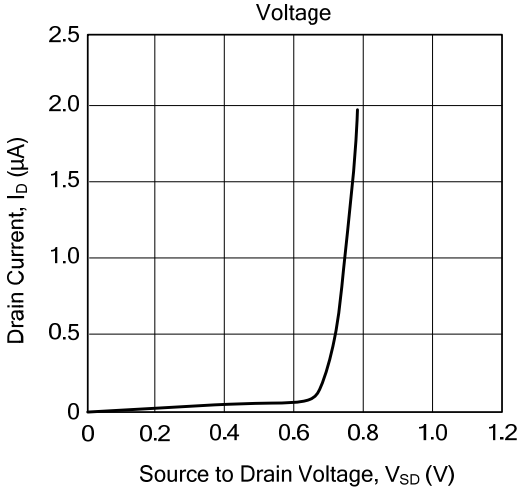


Normalized Maximum Transient Thermal Impedance

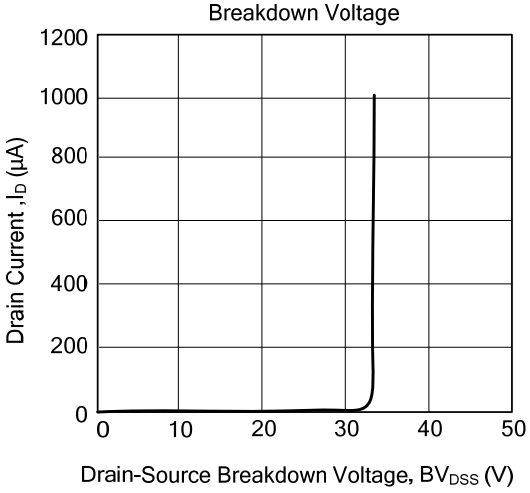


■ TYPICAL CHARACTERISTICS (Cont.)

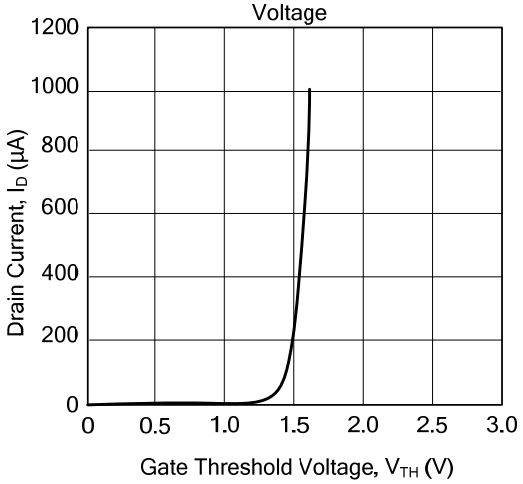
Drain Current vs. Source to Drain Voltage



Drain Current vs. Drain-Source Breakdown Voltage



Drain Current vs. Gate Threshold Voltage



Drain-Source On-State Resistance Characteristics