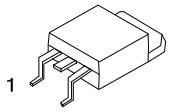
UTD454

Power MOSFET

N-CHANNEL ENHANCEMENT MODE POWER MOSFET



TO-252

■ DESCRIPTION

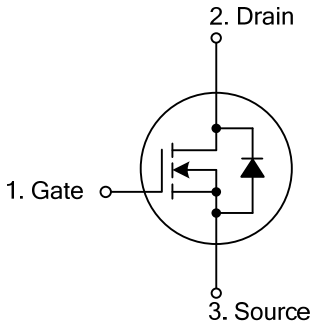
The UTC **UTD454** is an N-channel enhancement MOSFET providing perfect $R_{DS(ON)}$ and low gate charge with UTC advanced technology.

The UTC **UTD454** is intended for being used in PWM, load switching and general purpose applications.

■ FEATURES

* $R_{DS(ON)}$< 33 mΩ @V_{GS} = 10V
* $R_{DS(ON)}$< 47 mΩ @V_{GS} = 4.5V
* V_{DS} (V) = 40V
* I_D = 12 A @V_{GS} = 10V
* Low gate charge

■ SYMBOL



■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTD454L-TN3-R	UTD454G-TN3-R	TO-252	G	D	S	Tape Reel
UTD454L-TN3-T	UTD454G-TN3-T	TO-252	G	D	S	Tube

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

UTD454L-TN3-R

(1) Packing Type
(2) Package Type
(3) Lead Free

(1) R: Tape Reel, T: Tube
(2) TN3: TO-252
(3) G: Halogen Free, L: Lead Free

■ ABSOLUTE MAXIMUM RATINGS (T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current (T_C=25°C)	I_D	12	A
Pulsed Drain Current (Note 2)	I_{DM}	30	A
Avalanche Current (Note 2)	I_{AR}	12	A
Repetitive avalanche energy (L=0.1mH)(Note 2)	E_{AR}	20	mJ
Power Dissipation (T_C=25°C)	P_D	20	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. Pulse width limited by $T_{J(MAX)}$

■ THERMAL CHARACTERISTICS

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	60	°C/W
Junction to Case	θ_{JC}	3	°C/W

Note: Surface mounted on 1 in^2 copper pad of FR4 board with 2oz

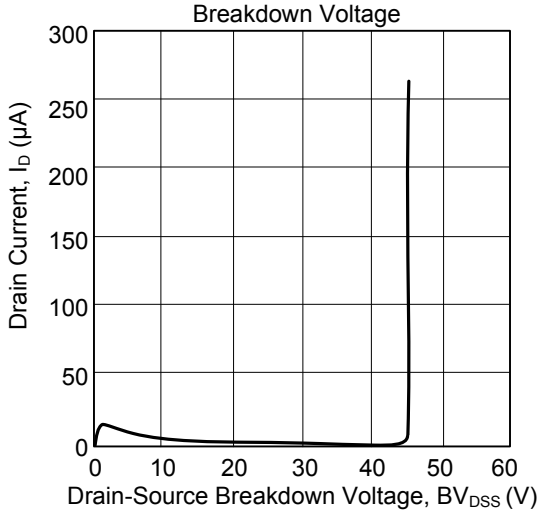
■ ELECTRICAL CHARACTERISTICS (T_J=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	I_D=250μA, V_{GS}=0V	40			V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=32V, V_{GS}=0V			1	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	1.8	2.3	3	V
On-State Drain Current	$I_{D(ON)}$	V_{GS}=10V, V_{DS}=5V	30			A
Drain to Source On-state Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=12A		25	33	mΩ
		V_{GS}=4.5V, I_D=6A		34	47	mΩ
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	V_{GS}=0V, V_{DS}=20V, f=1MHz		404	500	pF
Output Capacitance	C_{OSS}			95	150	pF
Reverse Transfer Capacitance	C_{RSS}			37	60	nC
Gate resistance	R_G	V_{GS}=0V, V_{DS}=0V, f=1MHz		2.7		Ω
SWITCHING PARAMETERS						
Turn-ON Delay Time	$t_{D(ON)}$	V_{GS}=10V, V_{DS}=20V, R_L=1.7Ω, R_{GEN}=3Ω		3.5		ns
Turn-ON Rise Time	t_R			6		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			13.2		ns
Turn-OFF Fall-Time	t_F			3.5		ns
Total Gate Charge	Q_G	V_{GS}=10V, V_{DS}=20V, I_D=12A		9.2		nC
Gate Source Charge	Q_{GS}			1.6		nC
Gate Drain Charge	Q_{GD}			2.6		nC
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage	V_{SD}	I_S=1A, V_{GS}=0V		0.76	1	V
Diode Continuous Forward Current	I_S				12	A
Reverse Recovery Time	t_{rr}	I_F=12A, dI/dt=100A/μs		22.9		ns
Reverse Recovery Charge	Q_{RR}			18.3		nC

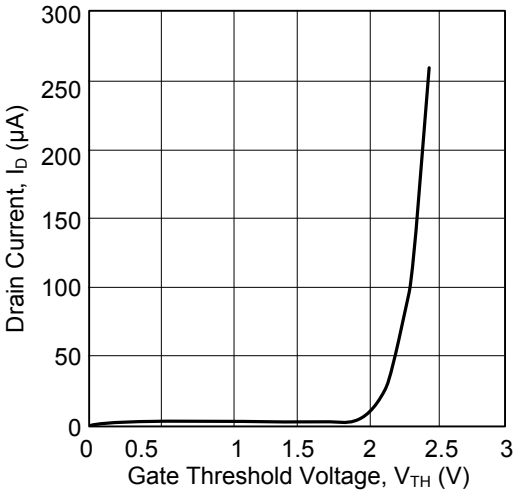
Note: Pulse width ≤300μs, duty cycle≤0.5%.

■ TYPICAL CHARACTERISTICS

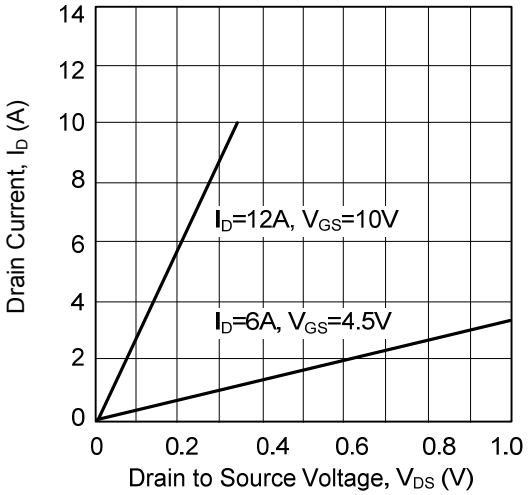
Drain Current vs. Drain-Source Breakdown Voltage



Drain Current vs. Gate Threshold Voltage



Drain-Source On-State Resistance Characteristics



Drain Current vs. Source to Drain Voltage