UTD3055 Preliminary Power MOSFET

POWER MOSFET 12 AMPS, 60 VOLTS N-CHANNEL DPAK

■ DESCRIPTION

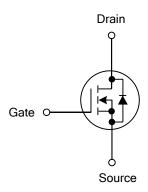
The UTC **UTD3055** is an N-channel Power MOSFET, and it can withstand high energy in the avalanche and commutation modes.

The UTC **UTD3055** is needed for applications, such as power supplies, converters and power motor controls which require low voltage and high speed switching. These devices are particularly well suited for bridge circuits where diode speed and commutating safe operating areas are critical and offer additional safety margin against unexpected voltage transients.

■ FEATURES

- * I_{DSS} and $V_{\text{DS(on)}}$ Specified At Elevated Temperature
- * Avalanche Energy Specified

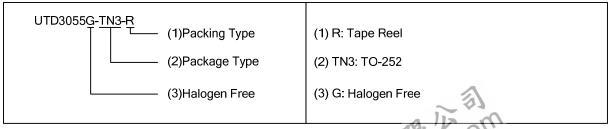
■ SYMBOL



ORDERING INFORMATION

Ordering Number	Dookogo	Pin Assignment			Dooking	
	Package	1	2	3	Packing	
UTD3055G-TN3-R	TO-252	G	D	S	Tape Reel	

Note: D; Drain, G: Gate, S: Source



1 TO-252

www.unisonic.com.tw

ABSOLUTE MAXIMUM RATINGS (T_C = 25°C unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Orain-Source Voltage		$V_{ extsf{DSS}}$	60	V
Drain-Gate Voltage (Ro	_{SS} =1.0MΩ)	V _{DGR} 60		V
Cata Cauraa Valtaga	Continuous	V_{GS}	±20	V
Gate-Source Voltage	Non-Repetitive (t _P ≤10µs)	V_{GSM}	±25	V
	Continuous @ 25°C	I _D	12	Α
Drain Current	Continuous @ 100°C	I _D	7.3	А
	Single Pulse (t _P ≤10µs)	I _{DM}	37	Α
Single Pulse Drain-to-	Source Avalanche			
Energy – Starting T _J = 25°C		E _{AS}	72	mJ
$(V_{DD} = 25 \text{ V}, V_{GS} = 10 \text{ V}, I_L = 12 \text{ A}, L = 1.0 \text{ mH}, R_G = 25 \Omega)$				
Total Power Dissipation @ 25°C			48	W
Total Power Dissipation @ T _A = 25°C, when mounted to		P_{D}	4 75	١٨/
minimum recommended pad size			1.75	W
Operating Junction Temperature		T_J	-55~175	°C
Storage Temperature		T _{STG}	-55~175	°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	θ_{JA}	100	W/°C
Junction to Case	θ_{JC}	3.13	W/°C

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

PARAMETER	SYMBOL	TEST CONDITIONS		TYP	MAX	UNIT		
OFF CHARACTERISTICS								
Drain-Source Breakdown Voltage	BV _{DSS}	I_D =250 μ A, V_{GS} =0 V	60			V		
		Temperature Coefficient (Positive)		65		mV/°C		
Drain-Source Leakage Current	I _{DSS}	V _{DS} =60V, V _{GS} =0V			10			
		V _{DS} =60V, V _{GS} =0V, T _J =150°C			100	μA		
Gate- Source Leakage Current	I_{GSS}	V _{GS} =±20V, V _{DS} =0			100	nA		
ON CHARACTERISTICS (Note)								
,	$V_{GS(TH)}$	$V_{DS}=V_{GS}$, $I_D=250\mu A$	2.0	2.7	4.0	V		
Gate Threshold Voltage		Temperature Coefficient (Negative)		5.4		mV/°C		
Static Drain-Source On-State	1	101/1-004		0.40	0.45			
Resistance	$R_{DS(ON)}$	V _{GS} =10V, I _D =6.0A		0.10	0.15	Ω		
Drain Course On Vellage (V =40V)	.,	I _D =12A		1.3	2.2	V		
Drain-Source On-Votlage (V _{GS} =10V)	$V_{DS(on)}$	I _D =6.0A, T _J =150°C			1.9			
Forward Transconductance	g FS	V _{DS} =7.0V, I _D =6.0A	4.0	5.0		S		
DYNAMIC PARAMETERS								
Input Capacitance	C _{ISS}			410	500	pF		
Output Capacitance	Coss	V _{GS} =0V, V _{DS} =25V, f=1.0MHz		130	180	pF		
Reverse Transfer Capacitance	C_{RSS}			25	50	pF		
Reverse Transfer Capacitance C _{RSS} 25 50 pF Note: Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%. UNISONIC TECHNOLOGIES CO., LTD www.unisonic.com.tw 20 20 20 20 20 20 20 20 20 2								
UNISONIC TECHNOLOGIES CO., LTD www.unisonic.com.tw 2 QW-R502-40								



■ ELECTRICAL CHARACTERISTICS (Cont.)

PARAMETER	SYMBOL	TEST CONDITIONS		TYP	MAX	UNIT		
SWITCHING PARAMETERS (Note 2)								
Gate Charge	Q_T			12.2	17	nC		
	Q_1	V _{GS} =10V, V _{DS} =48V, I _D =12A		3.2		nC		
	Q_2			5.2		nC		
	Q_3			5.5		nC		
Turn-ON Delay Time	$t_{D(ON)}$	V_{DD} =30V, V_{GS} =10V, I_{D} =12A, R_{G} =9.1 Ω		7.0	10	ns		
Rise Time	t_R			34	60	ns		
Turn-OFF Delay Time	$t_{D(OFF)}$			17	30	ns		
Fall-Time	t _F			18	50	ns		
SOURCE- DRAIN DIODE RATINGS AN	D CHARAC	TERISTICS						
Drain-Source Diode Forward Voltage	V_{SD}	I _S =12A, V _{GS} =0V	1.0		1.6	V		
(Note 1)	VSD	I _S =12A, V _{GS} =0V, T _J =150°C		0.91		V		
	t_{RR}	- I _S =12A, V _{GS} =0V, dls/dt=100A/us		56		ns		
Reverse Recovery Time	t_A			40		ns		
	t _B	is-12A, V _{GS} -0V, αισ/αι-100A/μσ		16		ns		
Reverse Recovery Charge	Q_{RR}			0.128		μC		
INTERNAL PACKAGE INDUCTANCE								
Internal Drain Inductance								
(Measured from the drain lead 0.25"	L_D			4.5		nΗ		
from package to center of die)								
Internal Source Inductance								
(Measured from the source lead 0.25,	L_S			7.5		nΗ		
from package to source bond pad)								

Note: 1. Pulse Test: Pulse Width≤300µs, Duty Cycle≤2%.

^{2.} Switching characteristics are independent of operating junction temperature.

UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice.