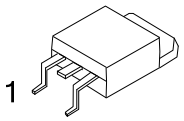
POWER MOSFET 12 AMPS, 60 VOLTS N–CHANNEL DPAK



TO-252

■ DESCRIPTION

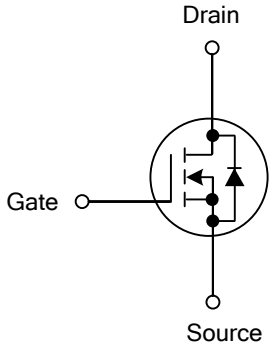
The UTC **UTD3055** is an N-channel Power MOSFET, and it can withstand high energy in the avalanche and commutation modes.

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 $V_{DS(on)}$ Specified At Elevated Temperature
* Avalanche Energy Specified

■ SYMBOL



■ ORDERING INFORMATION

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

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

UTD3055G-TN3-R (1)Packing Type (2)Package Type (3)Halogen Free	(1) R: Tape Reel (2) TN3: TO-252 (3) G: Halogen Free

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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	60	V
Drain-Gate Voltage (R_{GS}=1.0MΩ)		V_{DGR}	60	V
Gate-Source Voltage	Continuous	V_{GS}	±20	V
	Non-Repetitive (t_P≤10μs)	V_{GSM}	±25	V
Drain Current	Continuous @ 25°C	I_D	12	A
	Continuous @ 100°C	I_D	7.3	A
	Single Pulse (t_P≤10μs)	I_{DM}	37	A
Single Pulse Drain–to–Source Avalanche Energy – Starting T_J = 25°C (V_{DD} = 25 V, V_{GS} = 10 V, I_L = 12 A, L = 1.0 mH, R_G = 25 Ω)		E_{AS}	72	mJ
Total Power Dissipation @ 25°C		P_D	48	W
Total Power Dissipation @ T_A = 25°C, when mounted to 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	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	I_D=250μA, V_{GS}=0V	60			V
		Temperature Coefficient (Positive)		65		mV/°C
Drain-Source Leakage Current	I_{DSS}	V_{DS}=60V, V_{GS}=0V			10	μA
		V_{DS}=60V, V_{GS}=0V, T_J=150°C			100	
Gate- Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0			100	nA
ON CHARACTERISTICS (Note)						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250μA	2.0	2.7	4.0	V
		Temperature Coefficient (Negative)		5.4		mV/°C
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=6.0A		0.10	0.15	Ω
Drain-Source On-Votlage (V_{GS}=10V)	$V_{DS(on)}$	I_D=12A		1.3	2.2	V
		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}	V_{GS}=0V, V_{DS}=25V, f=1.0MHz		410	500	pF
Output Capacitance	C_{OSS}			130	180	pF
Reverse Transfer Capacitance	C_{RSS}			25	50	pF

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

■ ELECTRICAL CHARACTERISTICS (Cont.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
SWITCHING PARAMETERS (Note 2)						
Gate Charge	Q_T	V_{GS}=10V, V_{DS}=48V, I_D=12A		12.2	17	nC
	Q_1			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=9.1Ω		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 AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage (Note 1)	V_{SD}	I_S=12A, V_{GS}=0V		1.0	1.6	V
		I_S=12A, V_{GS}=0V, T_J=150°C		0.91		
Reverse Recovery Time	t_{RR}	I_S=12A, V_{GS}=0V, dIs/dt=100A/μs		56		ns
	t_A			40		ns
	t_B			16		ns
Reverse Recovery Charge	Q_{RR}			0.128		μC
INTERNAL PACKAGE INDUCTANCE						
Internal Drain Inductance (Measured from the drain lead 0.25'' from package to center of die)	L_D			4.5		nH
Internal Source Inductance (Measured from the source lead 0.25, from package to source bond pad)	L_S			7.5		nH

Note: 1. Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%.
2. Switching characteristics are independent of operating junction temperature.