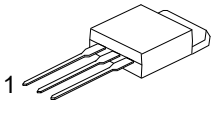
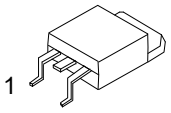
UT5504

Power MOSFET

P-CHANNEL LOGIC LEVEL ENHANCEMENT MODE FIELD EFFECT TRANSISTOR

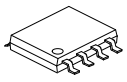


TO-251



TO-252

PDFN3×3



SOP-8

■ DESCRIPTION

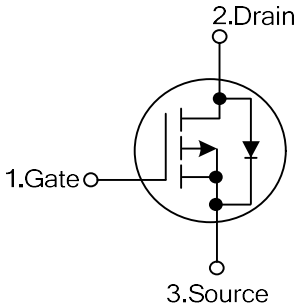
The UTC **UT5504** is a P-channel enhancement mode power MOSFET, providing customers fast switching, ruggedized device design, low on-resistance and cost-effectiveness by UTC's advanced technology.

The UTC **UT5504** can be used in applications such as DC/DC converters, all commercial-industrial surface mount and low voltage devices.

■ FEATURES

* Low On-Resistance
* Simple Drive Requirement
* Fast Switching Speed

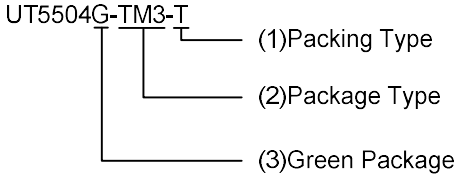
■ SYMBOL



■ ORDERING INFORMATION

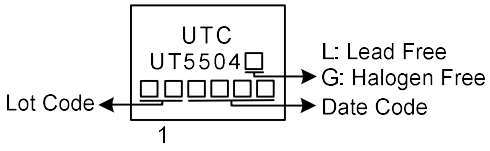
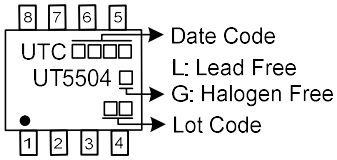
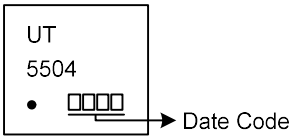
Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UT5504L-TM3-T	UT5504G-TM3-T	TO-251	G	D	S	-	-	-	-	-	Tube
UT5504L-TN3-R	UT5504G-TN3-R	TO-252	G	D	S	-	-	-	-	-	Tape Reel
UT5504L-S08-R	UT5504G-S08-R	SOP-8	S	S	S	G	D	D	D	D	Tape Reel
UT5504L-P3030-R	UT5504G-P3030-R	PDFN3×3	S	S	S	G	D	D	D	D	Tape Reel

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



(1) T: Tube, R: Tape Reel
(2) TM3: TO-251, TN3: TO-252, S08: SOP-8
P3030: PDFN3×3
(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING

TO-251 / TO-252	SOP-8
	
PDFN3×3	-
	-

■ ABSOLUTE MAXIMUM RATINGS (T_C = 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	-8	A
	T_C=70°C		-6	A
Pulsed Drain Current		I_{DM}	-32	A
Single Pulsed Avalanche Energy (Note 3)		E_{AS}	77	mJ
Power Dissipation	TO-251/TO-252	P_D	41	W
	SOP-8		1.6	W
	PDFN3×3		26	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 = 30mH, I_{AS} = 2.26A, V_{DD} =20V, R_G = 25Ω Starting T_J = 25°C

■ THERMAL DATA (NOTE 3)

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-251/TO-252	θ_{JA}	50	°C/W
	SOP-8		90	°C/W
	PDFN3×3		75	°C/W
Junction to Case	TO-251/TO-252	θ_{JC}	3	°C/W
	SOP-8		78	°C/W
	PDFN3×3		4.8	°C/W

Notes: 1. Pulse width limited by maximum junction temperature.
2. Duty cycle ≤ 1%
3. Device mounted on FR-4 substrate P_C 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}	I_D=-250μA, V_{GS}=0V	-40			V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=-32V, V_{GS}=0V			1	μA
		V_{DS}=-30V, V_{GS}=0V, T_J=125°C			10	
Gate- Source Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±20V			±250	nA
On-State Drain Current (Note 1)	$I_{D(ON)}$	V_{DS}=-5V, V_{GS}=-10V	-32			A
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=-250μA	-1.0		-2.5	V
Static Drain-Source On-State Resistance (Note 1)	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-8.0A		38	55	mΩ
		V_{GS}=-4.5V, I_D=-6.0A		55	94	mΩ
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	V_{GS}=0V, V_{DS}=-10V, f=1MHz		860		pF
Output Capacitance	C_{OSS}			160		pF
Reverse Transfer Capacitance	C_{RSS}			140		pF
SWITCHING PARAMETERS (Note 2)						
Total Gate Charge	Q_G	V_{GS}=-10V, V_{DS}=0.5BV_{DSS}, I_D=-8.0A		25	120	nC
Gate to Source Charge	Q_{GS}			5.8		nC
Gate to Drain Charge	Q_{GD}			4.8		nC
Turn-ON Delay Time	$t_{D(ON)}$	V_{GS}=-10V, V_{DS}=-20V, I_D ≒ -8.0A, R_{GS}=6Ω		7.2	35	ns
Rise Time	t_R			17.6	50	ns
Turn-OFF Delay Time	$t_{D(OFF)}$			38	250	ns
Fall-Time	t_F			24	120	ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Continuous Current	I_S				-8	A
Pulsed Current (Note 3)	I_{SM}				-32	A
Drain-Source Diode Forward Voltage (Note 1)	V_{SD}	I_F=I_S, V_{GS}=0V			-1.2	V
Reverse Recovery Time	t_{rr}	I_F=-5.0A, dI_F/dt=100A/μs		98		ns
Reverse Recovery Charge	Q_{rr}			220		nC

Notes: 1. Pulse test: Pulse Width ≤ 300μs, Duty cycle ≤ 2%.
2. Independent of operating temperature.
3. Pulse width limited by maximum junction temperature.

■ TYPICAL CHARACTERISTICS