



# UT5504

*Power MOSFET*

## P-CHANNEL LOGIC LEVEL ENHANCEMENT MODE FIELD EFFECT TRANSISTOR

■ DESCRIPTION

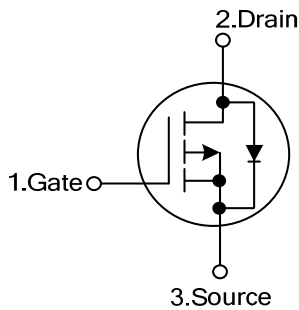
The UTC **UT5504** is a P-channel enhancement mode power MOSFET, providing customers fast switching, ruggedized device design, low on-resistance and cost-effectiveness by UTC's advanced technology.

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

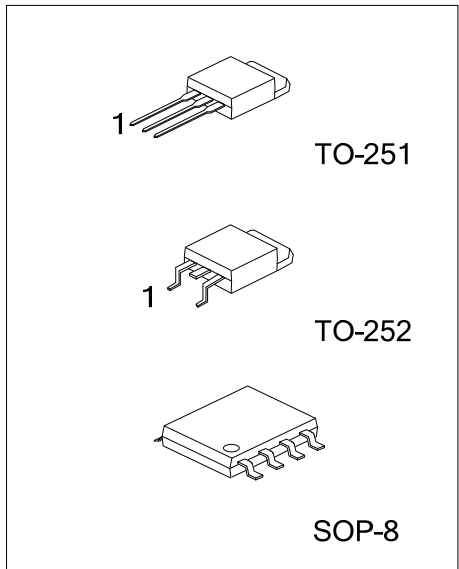


■ ORDERING INFORMATION

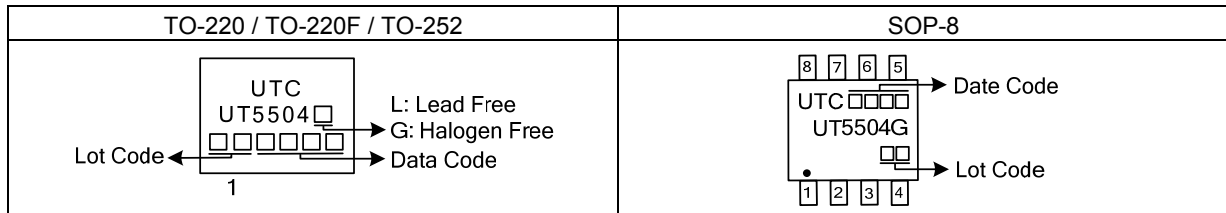
Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UT5504L-TM3-T	UT5504G-TM3-T	TO-251	G	D	S	-	-	-	-	-	Tube
UT5504L-TN3-R	UT5504G-TN3-R	TO-252	G	D	S	-	-	-	-	-	Tape Reel
-	UT5504G-S08-R	SOP-8	S	S	S	G	D	D	D	D	Tape Reel

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

<p>UT5504L-TM3-R</p> <p>(1)Packing Type</p> <p>(2)Package Type</p> <p>(3)Green Package</p>	<p>(1) T: Tube, R: Tape Reel</p> <p>(2) TM3: TO-251, TN3: TO-252, S08: SOP-8</p> <p>(3) L: Lead Free, G: Halogen Free and Lead Free</p>
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■ MARKING



■ ABSOLUTE MAXIMUM RATINGS ( $T_C = 25^\circ\text{C}$ , unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	$V_{DS}$	-40	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current	$I_D$	$T_C=25^\circ\text{C}$	-8
		$T_C=70^\circ\text{C}$	-6
Pulsed Drain Current	$I_{DM}$	-32	A
Power Dissipation	$P_D$	TO-251/TO-252	41
		SOP-8	5
Junction Temperature	$T_J$	+150	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	-55 ~ +150	$^\circ\text{C}$

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	$\theta_{JA}$	TO-251/TO-252	75
		SOP-8	50
Junction to Case	$\theta_{JC}$	TO-251/TO-252	3
		SOP-8	25

Notes: 1. Pulse width limited by maximum junction temperature.  
2. Duty cycle  $\leq 1\%$

■ ELECTRICAL CHARACTERISTICS ( $T_C = 25^\circ\text{C}$ , unless otherwise specified)

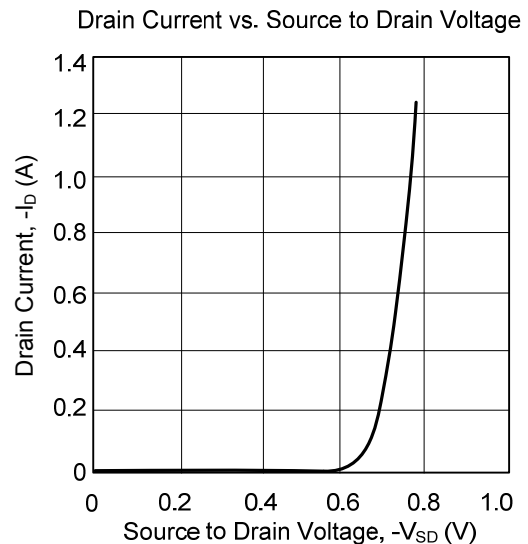
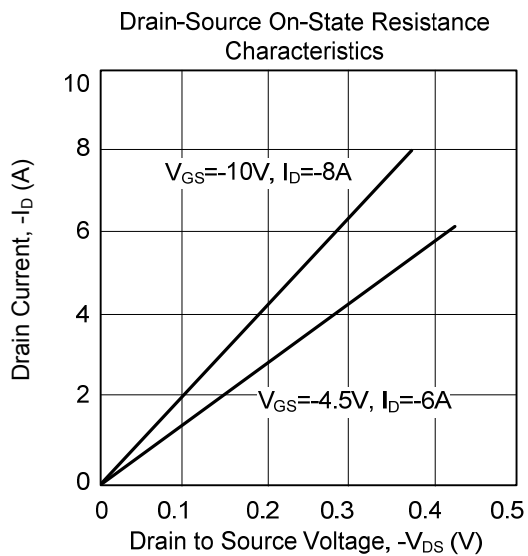
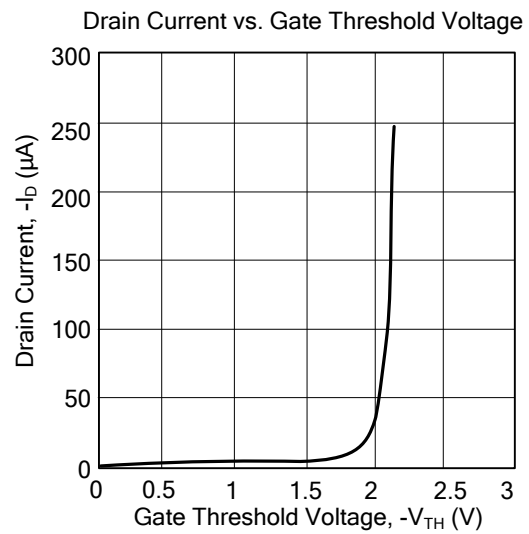
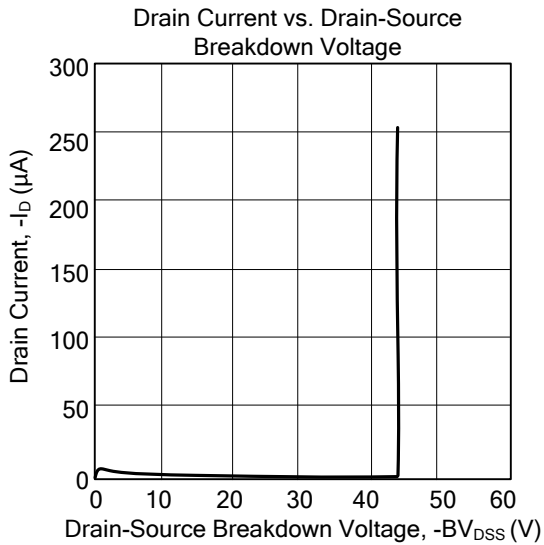
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$I_D = -250\mu\text{A}$ , $V_{GS} = 0\text{V}$	-40			V
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS} = -32\text{V}$ , $V_{GS} = 0\text{V}$			1	$\mu\text{A}$
		$V_{DS} = -30\text{V}$ , $V_{GS} = 0\text{V}$ , $T_J = 125^\circ\text{C}$			10	
Gate- Source Leakage Current	$I_{GSS}$	$V_{DS} = 0\text{V}$ , $V_{GS} = \pm 20\text{V}$			$\pm 250$	nA
On-State Drain Current (Note 1)	$I_{D(ON)}$	$V_{DS} = -5\text{V}$ , $V_{GS} = -10\text{V}$	-32			A
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS} = V_{GS}$ , $I_D = -250\mu\text{A}$	-1	-1.5	-2.5	V
Static Drain-Source On-State Resistance (Note 1)	$R_{DS(ON)}$	$V_{GS} = -4.5\text{V}$ , $I_D = -6\text{A}$		65	94	m $\Omega$
		$V_{GS} = -10\text{V}$ , $I_D = -8\text{A}$		45	55	
Forward Transconductance (Note 1)	$g_{FS}$	$V_{DS} = -10\text{V}$ , $I_D = -8\text{A}$		11		S
<b>DYNAMIC PARAMETERS</b>						
Input Capacitance	$C_{ISS}$	$V_{GS} = 0\text{V}$ , $V_{DS} = 10\text{V}$ , $f = 1\text{MHz}$		1078		pF
Output Capacitance	$C_{OSS}$			131		pF
Reverse Transfer Capacitance	$C_{RSS}$			100		pF
<b>SWITCHING PARAMETERS (Note 2)</b>						
Total Gate Charge	$Q_G$	$V_{GS} = -10\text{V}$ , $V_{DS} = 0.5BV_{DSS}$ , $I_D = -8\text{A}$		91	120	nC
Gate to Source Charge	$Q_{GS}$			9.6		nC
Gate to Drain Charge	$Q_{GD}$			4.7		nC
Turn-ON Delay Time	$t_{D(ON)}$	$V_{GS} = -10\text{V}$ , $V_{DS} = -20\text{V}$ , $I_D = -1\text{A}$ , $R_{GS} = 6\Omega$		28	35	ns
Rise Time	$t_R$			40	50	ns
Turn-OFF Delay Time	$t_{D(OFF)}$			198	250	ns
Fall-Time	$t_F$			78	120	ns

■ ELECTRICAL CHARACTERISTICS(Cont.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
Drain-Source Diode Forward Voltage (Note 1)	$V_{SD}$	$I_F=I_S, V_{GS}=0V$			-1	V
Reverse Recovery Time	$t_{RR}$	$I_F=-5A, dI_F/dt=100A/\mu s$		15.5		ns
Reverse Recovery Charge	$Q_{RR}$			7.9		nC
Continuous Current	$I_S$				-8	A
Pulsed Current (Note 3)	$I_{SM}$				-32	A

- Notes: 1. Pulse test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .  
 2. Independent of operating temperature.  
 3. Pulse width limited by maximum junction temperature.

## TYPICAL CHARACTERISTICS



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