

UTC UNISONIC TECHNOLOGIES CO., LTD

UT7410 Preliminary Power MOSFET

30V, 24A N-CHANNEL ENHANCEMENT MODE POWER MOSFET

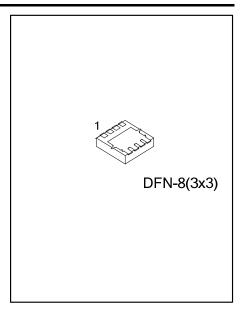
DESCRIPTION

The UTC UT7410 is an N-channel enhancement MOSFET, it uses UTC's advanced technology to provide the customers with perfect $R_{DS(ON)}$ and low gate charge.

The UTC UT7410 is suitable for Load Switch and DC-DC converters applications, etc.



^{*} $R_{DS(ON)}$ < 24m Ω @ V_{GS} =10V, I_{D} =8A $R_{DS(ON)}$ < 32m Ω @ V_{GS} =4.5V, I_D =7A

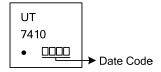


ORDERING INFORMATION

Ordening Number			Darling	Pin Assignment							Daaldaa	
	Ordering Number	Package	1	2	3	4	5	6	7	8	Packing	
	UT7410G-K08-3030-F	DFN-8(3×3)	S	S	S	G	D	D	D	D	Tape Reel	
No	e: Pin Assignment: G: Gate	D: Drain S	S: Source									

UT7410<u>G-K08-3030</u>-<u>R</u> - (1)Packing Type (1) R: Tape Reel (2) K08-3030: DFN-8(3×3) (2)Package Type - (3)Green Package (3) G: Halogen Free and Lead Free

MARKING



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^{*} Low Gate Charge (typical 9.8nC)

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

PARAMETER			SYMBOL	RATINGS	UNIT	
Drain-Source Voltage			V_{DSS}	30	V	
Gate-Source Voltage			V_{GSS}	±20	V	
		$T_{C}=100^{\circ}C$ $T_{D}=100^{\circ}C$ $T_{C}=100^{\circ}C$ T_{C	T _C =25°C	,	24	Α
	Continuous		15	Α		
Drain Current	Continuous		T _A =25°C	I _{DSM}	9.5	Α
			T _A =70°C		7.7	Α
	Pulsed (Note 3)			I _{DM}	40	Α
	,		T _C =25°C	Б	20	W
Dower Dissipa	tion	(Note 2)	T _C =100°C	P_{D}	8.3	W
Power Dissipation		(Note 1)	T _A =25°C	В	3.1	W
			T _A =70°C	P _{DSM}	2	W
Junction Temperature				T_J	-55~+150	°C
Storage Temperature Range			·	T _{STG}	-55~+150	°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 CHARACTERISTICS

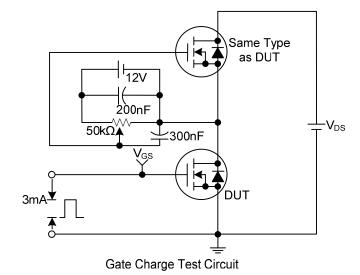
PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT	
Lunction to Ambient (Note 1)	t≤10s	0		30	40	°C/W
Junction to Ambient (Note 1)	Steady-State	θ_{JA}		60	75	°C/W
Junction to Case (Note 2)	Steady-State	θ_{JC}		5	6	°C/W

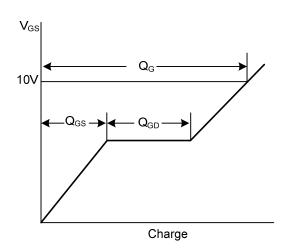
- Notes: 1. The value of θ_{JA} is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C. The Power dissipation P_{DSM} is based on θ_{JA} t≤10s value and the maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design, and the maximum temperature of 150°C may be used if the PCB allows it.
 - 2. The power dissipation P_D is based on $T_{J(MAX)}$ =150°C, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.
 - 3. Repetitive rating, pulse width limited by junction temperature T_{J(MAX)}=150°C.

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

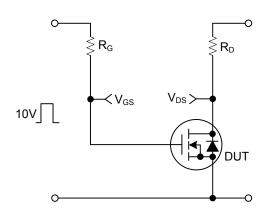
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltag	е	BV _{DSS}	I _D =250μA, V _{GS} =0V	30			V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =30V, V _{GS} =0V			1	μΑ
Cata Carraga Lagliana Crimant	Forward		V _{GS} =+20V, V _{DS} =0V			+100	nA
Gate-Source Leakage Current	Reverse	I_{GSS}	V _{GS} =-20V, V _{DS} =0V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	$V_{DS}=V_{GS}$, $I_D=250\mu A$	1.4	1.8	2.5	V
Static Drain-Source On-Resistance		В	V_{GS} =10V, I_D =8A		18	24	mΩ
		R _{DS(ON)}	V_{GS} =4.5V, I_D =7A		27	32	mΩ
Forward Transconductance		g fs	V_{DS} =5V, I_D =8A		30		S
On State Drain Current		I _{D(ON)}	V _{GS} =10V, V _{DS} =5V	40			Α
DYNAMIC PARAMETERS							
Input Capacitance		C _{ISS}			550		pF
Output Capacitance		Coss	V _{GS} =0V, V _{DS} =15V, f=1.0MHz		110		pF
Reverse Transfer Capacitance		C _{RSS}			55		pF
Gate resistance		R_G	V_{GS} =0V, V_{DS} =0V, f=1.0MHz		4	4.9	Ω
SWITCHING PARAMETERS							
Total Cata Charge	10V	Q_{G}			9.8		nC
Total Gate Charge	4.5V	$V = V_{GS} = 10V, V_{DS} = 15V, I_{D} = 8A$		4.6		nC	
Gate to Source Charge		Q_GS	V _{GS} -10V, V _{DS} -15V, I _D -8A		1.8		nC
Gate to Drain Charge		Q_GD			2.2		nC
Turn-ON Delay Time		t _{D(ON)}			5		ns
Rise Time		t _R	V_{GS} =10V, V_{DS} =15V, R_L =2 Ω ,		3.2		ns
Turn-OFF Delay Time		t _{D(OFF)}	R_{GEN} =3 Ω		24		ns
Fall-Time		t _F			ns		
SOURCE- DRAIN DIODE RATII	NGS AND (CHARACTER	RISTICS				
Maximum Body-Diode Continuo	us Current	Is				1.7	Α
Drain-Source Diode Forward Vo	Itage	V_{SD}	I _S =1A, V _{GS} =0V 0.75 1				

■ TEST CIRCUITS AND WAVEFORMS

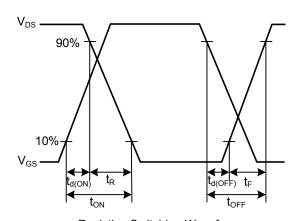




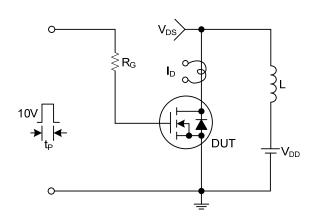
Gate Charge Waveforms



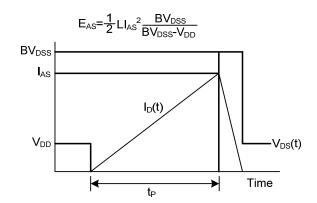
Resistive Switching Test Circuit



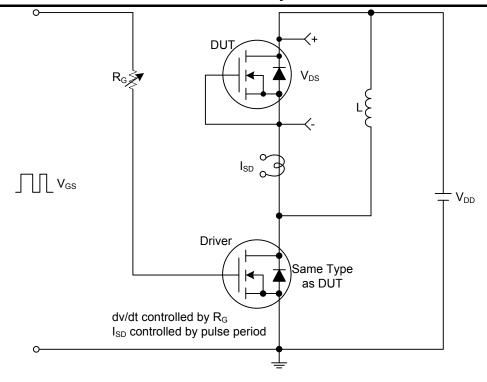
Resistive Switching Waveforms

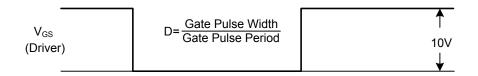


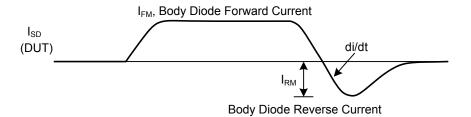
Unclamped Inductive Switching Test Circuit

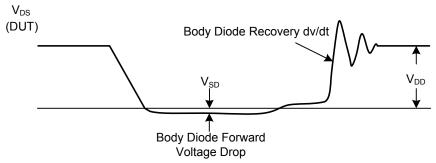


Unclamped Inductive Switching Waveforms









Peak Diode Recovery dv/dt Test Circuit and Waveforms

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