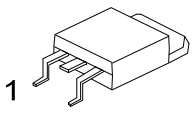
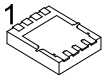
UT3006

Power MOSFET

55A, 30V N-CHANNEL ENHANCEMENT MODE POWER MOSFET



TO-252



PDFN5×6

■ DESCRIPTION

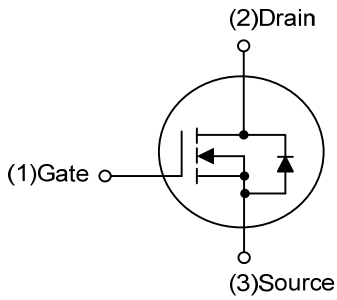
The UTC **UT3006** is a N-channel enhancement MOSFET using UTC's advanced technology to provide the customers with perfect $R_{DS(ON)}$, cost-effectiveness and high switching speed.

This UTC **UT3006** is suitable for DC/DC converters, etc.

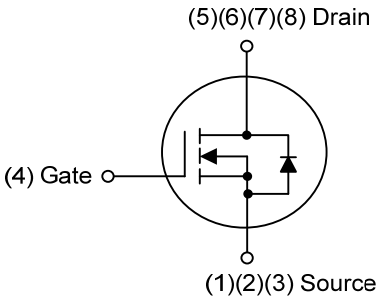
■ FEATURES

* $R_{DS(ON)} \leq 9.0\ m\Omega$ @ V_{GS}=10V, I_D=30A
  $R_{DS(ON)} \leq 16\ m\Omega$ @ V_{GS}=4.5V, I_D=20A
* High Switching Speed

■ SYMBOL



TO-252



PDFN5×6

■ ORDERING INFORMATION

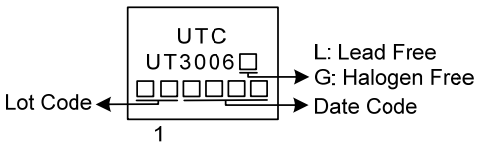
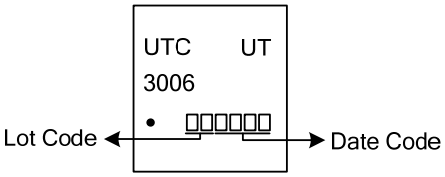
Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UT3006L-TN3-R	UT3006G-TN3-R	TO-252	G	D	S	-	-	-	-	-	Tape Reel
UT3006L-P5060-R	UT3006G-P5060-R	PDFN5×6	S	S	S	G	D	D	D	D	Tape Reel

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

UT3006G-TN3-R

(1)Packing Type	(1) R: Tape Reel
(2)Package Type	(2) TN3: TO-252, P5060: PDFN5×6
(3)Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING

TO-252	PDFN5×6
	

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

PARAMETER			SYMBOL	RATINGS	UNIT
Drain-Source Voltage			V_{DSS}	30	V
Gate-Source Voltage			V_{GSS}	±20	V
Drain Current	Continuous V_{GS}@10V	T_C=25°C	I_D	55	A
		T_C=100°C		39	A
	Pulsed (Note 2)		I_{DM}	160	A
Avalanche Energy	Single Pulsed (Note 3)		E_{AS}	88	mJ
Power Dissipation (T_C=25°C)		TO-252	P_D	54	W
		PDFN5×6		28	W
Junction Temperature			T_J	+175	°C
Storage Temperature			T_{STG}	-55 ~ +175	°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. Pulse test.
3. L=0.1mH, I_{AS}=42A, V_{DD}=30V, R_G=25Ω, Starting T_J = 25°C

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-252	θ_{JA}	50	°C/W
	PDFN5×6		65	°C/W
Junction to Case	TO-252	θ_{JC}	2.3	°C/W
	PDFN5×6		4.4	°C/W

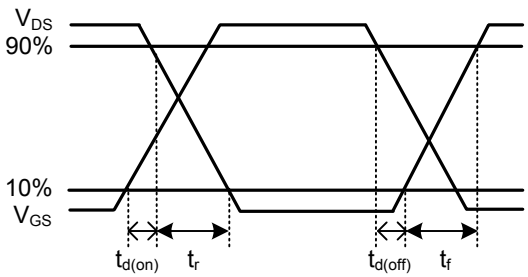
Note: Device mounted on FR-4 substrate P_C board, 2oz copper, with 1inch square copper plate.

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

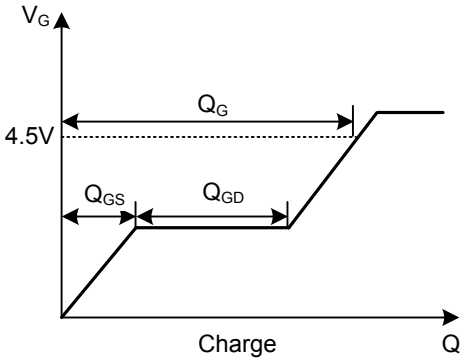
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	I_D=250μA, V_{GS}=0V	30			V
Drain-Source Leakage Current		I_{DSS}	V_{DS}=30V, V_{GS}=0V			10	μA
Gate- Source Leakage Current	Forward	I_{GSS}	V_{DS}=0V, V_{GS}=+20V			+100	nA
	Reverse		V_{DS}=0V, V_{GS}=-20V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250μA	1.0		3.0	V
Static Drain-Source On-State Resistance (Note)		$R_{DS(ON)}$	V_{GS}=10V, I_D=30A			9	mΩ
			V_{GS}=4.5V, I_D=20A			16	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	V_{GS}=0V, V_{DS}=25V, f=1.0MHz		2200		pF
Output Capacitance		C_{OSS}			420		pF
Reverse Transfer Capacitance		C_{RSS}			365		pF
Gate Resistance		R_G	f=1.0MHz		1.9		Ω
SWITCHING PARAMETERS							
Total Gate Charge (Note)		Q_G	V_{GS}=4.5V, V_{DS}=24V, I_D=30A		32		nC
Gate to Source Charge		Q_{GS}			8		nC
Gate to Drain Charge		Q_{GD}			18		nC
Turn-ON Delay Time (Note)		$t_{D(ON)}$	V_{DS}=15V, I_D=30A, R_G=3.3Ω, V_{GS}=10V, R_D=0.5 Ω		14		ns
Rise Time		t_R			19		ns
Turn-OFF Delay Time		$t_{D(OFF)}$			42		ns
Fall-Time		t_F			35		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I_S				55	A
Maximum Body-Diode Pulsed Current		I_{SM}				160	A
Drain-Source Diode Forward Voltage (Note)		V_{SD}	I_S=30A, V_{GS}=0V			1.2	V

Note: Pulse test.

■ TEST CIRCUITS AND WAVEFORMS



Switching Time Waveform



Gate Charge Waveform

■ TYPICAL CHARACTERISTICS