



## MMBF170

Preliminary

Power MOSFET

### 0.5A, 60V N-CHANNEL ENHANCEMENT MODE FIELD EFFECT TRANSISTOR

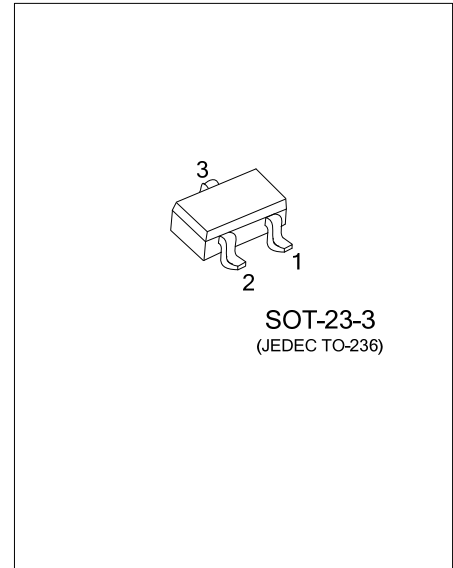
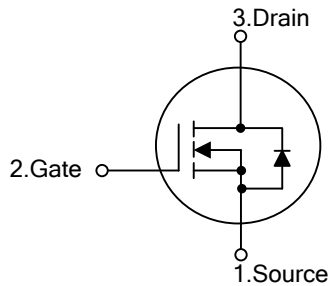
#### DESCRIPTION

The UTC **MMBF170** is an N-channel enhancement MOSFET using UTC's advanced technology to provide the customers with perfect  $R_{DS(ON)}$ , low input capacitance, low gate threshold voltage and high switching speed.

#### FEATURES

- \*  $R_{DS(ON)} < 5m\Omega @ V_{GS}=10V, I_D=0.2A$
- \* High Switching Speed
- \* Low Input Capacitance (typical 22pF)

#### SYMBOL



#### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
MMBF170L-AE2-R	MMBF170G-AE2-R	SOT-23	S	G	D	Tape Reel

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

MMBF170L-AE2-R	(1)Packing Type	(1) R: Tape Reel
	(2)Package Type	(2) AE2: SOT-23-3
	(3)Lead Free	(3) G: Halogen Free, L: Lead Free

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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		$V_{DSS}$	60	V
Gate-Source Voltage	Continuous	$V_{GSS}$	$\pm 20$	V
	Pulsed		$\pm 40$	V
Drain-Gate Voltage $R_{GS} \leq 1.0\text{M}\Omega$		$V_{DGR}$	60	V
Drain Current (Note 2)	Continuous	$I_D$	500	mA
	Pulsed	$I_{DM}$	800	mA
Power Dissipation (Note 2)		$P_D$	225	mW
Derating above $T_A=25^\circ\text{C}$ (Note 2)			1.80	mW/ $^\circ\text{C}$
Junction Temperature		$T_J$	150	$^\circ\text{C}$
Storage Temperature		$T_{STG}$	-55~+150	$^\circ\text{C}$

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. Valid provided that terminals are kept at specified ambient temperature.

■ THERMAL CHARACTERISTICS

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	$\theta_{JA}$	556	$^\circ\text{C/W}$

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b> (Note 1)						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$I_D=100\mu\text{A}$ , $V_{GS}=0\text{V}$	60	70		V
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=60\text{V}$ , $V_{GS}=0\text{V}$			1.0	$\mu\text{A}$
Gate- Source Leakage Current	$I_{GSS}$	Forward			+10	nA
		Reverse			-10	nA
<b>ON CHARACTERISTICS</b> (Note 1)						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}$ , $I_D=-250\mu\text{A}$	0.8	2.1	3.0	V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10\text{V}$ , $I_D=200\text{mA}$			5.0	$\Omega$
		$V_{GS}=4.5\text{V}$ , $I_D=50\text{mA}$			5.3	
Forward Transconductance	$g_{FS}$	$V_{DS}=10\text{V}$ , $I_D=0.2\text{A}$	80			mS
<b>DYNAMIC PARAMETERS</b>						
Input Capacitance	$C_{ISS}$	$V_{GS}=0\text{V}$ , $V_{DS}=10\text{V}$ , $f=1.0\text{MHz}$		22	40	pF
Output Capacitance	$C_{OSS}$			11	30	pF
Reverse Transfer Capacitance	$C_{RSS}$			2.0	5.0	pF
<b>SWITCHING PARAMETERS</b>						
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DD}=25\text{V}$ , $I_D=0.5\text{A}$ , $V_{GS}=10\text{V}$ ,			10	ns
Turn-OFF Delay Time	$t_{D(OFF)}$	$R_{GEN}=50\Omega$			10	ns

Notes: 1. Pulse width  $\leq 300\mu\text{s}$ , duty cycle  $\leq 2\%$ .

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