

# N-CHANNEL POWER MOSFET

## LMBF170LT1

### FEATURE

- Pb-Free Package is available.

### DEVICE MARKING AND ORDERING INFORMATION

Device	Marking	Shipping
LMBF170LT1	6Z	3000/Tape&Reel
LMBF170LT1G	6Z (Pb-Free)	3000/Tape&Reel
LMBF170LT3	6Z	10000/Tape&Reel
LMBF170LT3G	6Z (Pb-Free)	10000/Tape&Reel

### MAXIMUM RATINGS

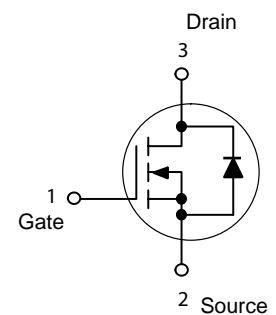
Rating	Symbol	Value	Unit
Drain-Source Voltage	$V_{DSS}$	60	Vdc
Drain-Gate Voltage	$V_{DGS}$	60	Vdc
Gate-Source Voltage	$V_{GS}$	$\pm 20$	Vdc
- Continuous	$V_{GSM}$	$\pm 40$	Vpk
- Non-repetitive ( $t_p \leq 50 \mu s$ )			
Drain Current - Continuous	$I_D$	0.5	Adc
- Pulsed	$I_{DM}$	0.8	

### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation FR-5 Board (Note 1.) $T_A = 25^\circ C$ Derate above $25^\circ C$	$P_D$	225 1.8	mW mW/ $^\circ C$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	556	$^\circ C/W$
Junction and Storage Temperature	$T_J, T_{stg}$	-55 to +150	$^\circ C$

1. FR-5 =  $1.0 \times 0.75 \times 0.062$  in.

**LMBF170LT1**



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**ELECTRICAL CHARACTERISTICS** ( $T_a = 25^\circ\text{C}$  unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
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**OFF CHARACTERISTICS**

Drain–Source Breakdown Voltage ( $V_{GS} = 0$ , $I_D = 100\ \mu\text{A}$ )	$V_{(BR)DSS}$	60	–	Vdc
Gate–Body Leakage Current, Forward ( $V_{GSF} = 15\ \text{Vdc}$ , $V_{DS} = 0$ )	$I_{GSS}$	–	10	nAdc

**ON CHARACTERISTICS** (Note 2.)

Gate Threshold Voltage ( $V_{DS} = V_{GS}$ , $I_D = 1.0\ \text{mA}$ )	$V_{GS(th)}$	0.8	3.0	Vdc
Static Drain–Source On–Resistance ( $V_{GS} = 10\ \text{Vdc}$ , $I_D = 200\ \text{mA}$ )	$r_{DS(on)}$	–	5.0	$\Omega$
On–State Drain Current ( $V_{DS} = 25\ \text{Vdc}$ , $V_{GS} = 0$ )	$I_{D(off)}$	–	0.5	$\mu\text{A}$

**DYNAMIC CHARACTERISTICS**

Input Capacitance ( $V_{DS} = 10\ \text{Vdc}$ , $V_{GS} = 0\ \text{V}$ , $f = 1.0\ \text{MHz}$ )	$C_{iss}$	–	60	pF
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**SWITCHING CHARACTERISTICS** (Note 2.)

Turn–On Delay Time	( $V_{DD} = 25\ \text{Vdc}$ , $I_D = 500\ \text{mA}$ , $R_{gen} = 50\ \Omega$ ) Figure 1	$t_{d(on)}$	–	10	ns
Turn–Off Delay Time		$t_{d(off)}$	–	10	

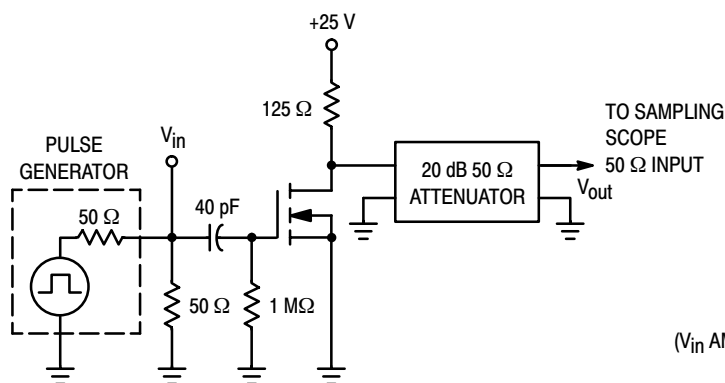
 2. Pulse Test: Pulse Width  $\leq 300\ \mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .


Figure 1. Switching Test Circuit

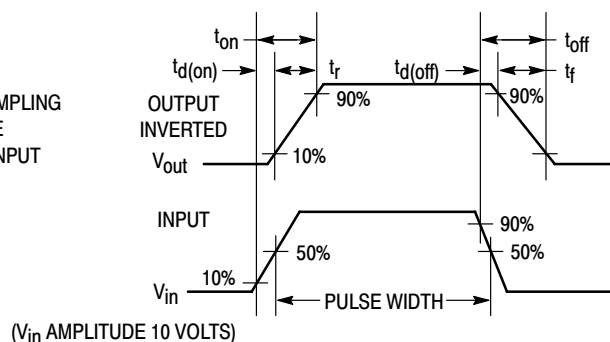


Figure 2. Switching Waveform

TYPICAL ELECTRICAL CHARACTERISTICS

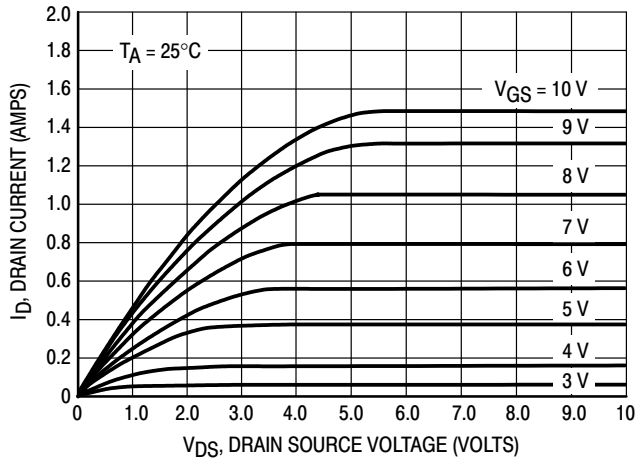


Figure 3. Ohmic Region

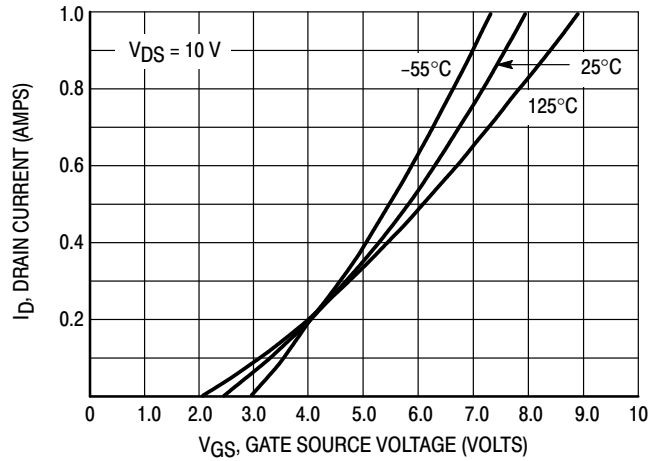


Figure 4. Transfer Characteristics

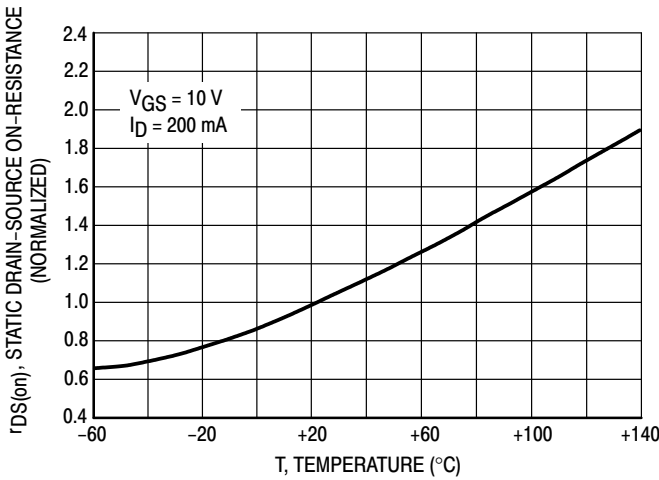


Figure 5. Temperature versus Static Drain-Source On-Resistance

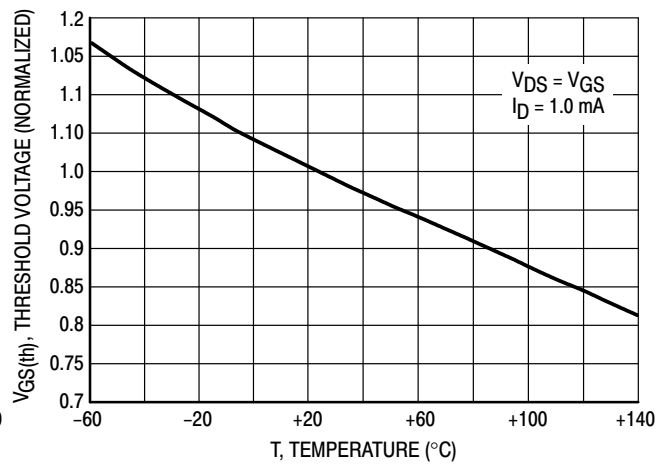
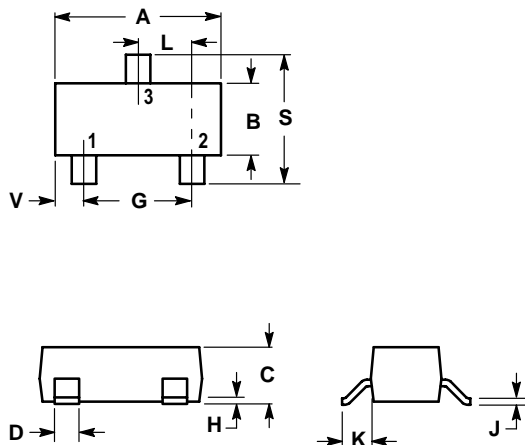


Figure 6. Temperature versus Gate Threshold Voltage

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**SOT-23**

**NOTES:**

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
<b>A</b>	0.1102	0.1197	2.80	3.04
<b>B</b>	0.0472	0.0551	1.20	1.40
<b>C</b>	0.0350	0.0440	0.89	1.11
<b>D</b>	0.0150	0.0200	0.37	0.50
<b>G</b>	0.0701	0.0807	1.78	2.04
<b>H</b>	0.0005	0.0040	0.013	0.100
<b>J</b>	0.0034	0.0070	0.085	0.177
<b>K</b>	0.0140	0.0285	0.35	0.69
<b>L</b>	0.0350	0.0401	0.89	1.02
<b>S</b>	0.0830	0.1039	2.10	2.64
<b>V</b>	0.0177	0.0236	0.45	0.60

- PIN 1. Gate  
 2. Source  
 3. Drain

