GREEN LINE™

BSS138LT1

Motorola Preferred Device

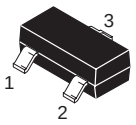
N-Channel Enhancement Mode Logic Level SOT-23 MOSFET

N–CHANNEL
LOGIC LEVEL
TMOS FET
TRANSISTOR

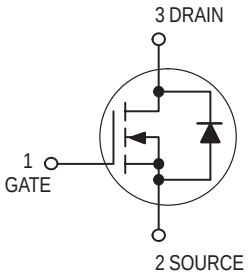
Typical applications are dc–dc converters, power management in portable and battery–powered products such as computers, printers, PCMCIA cards, cellular and cordless telephones.

- Low Threshold Voltage ($V_{GS(th)}$: 0.5V...1.5V) makes it ideal for low voltage applications
- Miniature SOT–23 Surface Mount Package saves board space

HD TMOS™



CASE 318–08, Style 21
SOT–23 (TO–236A)



MAXIMUM RATINGS (T_A = 25°C unless otherwise noted)

Rating	Symbol	Value	Unit
Drain–to–Source Voltage	V_{DSS}	50	Vdc
Gate–to–Source Voltage — Continuous	V_{GS}	± 20	Vdc
Drain Current — Continuous @ T_A = 25°C — Pulsed Drain Current ($t_p \leq 10$ μs)	I_D I_{DM}	200 800	mA
Total Power Dissipation @ T_A = 25°C	P_D	225	mW
Operating and Storage Temperature Range	T_J, T_{stg}	– 55 to 150	°C
Thermal Resistance — Junction–to–Ambient	$R_{\theta JA}$	556	°C/W
Maximum Lead Temperature for Soldering Purposes, for 10 seconds	T_L	260	°C

DEVICE MARKING

BSS138LT1 = J1

ORDERING INFORMATION

Device	Reel Size	Tape Width	Quantity
BSS138LT1	7″	8mm embossed tape	3000
BSS138LT3	13″	8mm embossed tape	10,000

Preferred devices are Motorola recommended choices for future use and best overall value.

REV 1

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristic		Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain–to–Source Breakdown Voltage (V_{GS} = 0 Vdc, I_D = 250 μAdc)		$V_{(BR)DSS}$	50	—	—	Vdc
Zero Gate Voltage Drain Current (V_{DS} = 25 Vdc, V_{GS} = 0 Vdc) (V_{DS} = 50 Vdc, V_{GS} = 0 Vdc)		I_{DSS}	— —	— —	0.1 0.5	μAdc
Gate–Source Leakage Current (V_{GS} = ± 20 Vdc, V_{DS} = 0 Vdc)		I_{GSS}	—	—	±0.1	μAdc
ON CHARACTERISTICS(1)						
Gate–Source Threshold Voltage (V_{DS} = V_{GS}, I_D = 1.0 mAdc)		$V_{GS(th)}$	0.5	—	1.5	Vdc
Static Drain–to–Source On–Resistance (V_{GS} = 2.75 Vdc, I_D < 200 mAdc, T_A = –40°C to +85°C) (V_{GS} = 5.0 Vdc, I_D = 200 mAdc)		$r_{DS(on)}$	— —	5.6 —	10 3.5	Ohms
Forward Transconductance (V_{DS} = 25 Vdc, I_D = 200 mAdc, f = 1.0 kHz)		g_{fs}	100	—	—	mmhos
DYNAMIC CHARACTERISTICS						
Input Capacitance	(V_{DS} = 25 Vdc, V_{GS} = 0, f = 1 MHz)	C_{iss}	—	40	50	pF
Output Capacitance	(V_{DS} = 25 Vdc, V_{GS} = 0, f = 1 MHz)	C_{oss}	—	12	25	
Transfer Capacitance	(V_{DG} = 25 Vdc, V_{GS} = 0, f = 1 MHz)	C_{rss}	—	3.5	5.0	
SWITCHING CHARACTERISTICS(2)						
Turn–On Delay Time	(V_{DD} = 30 Vdc, I_D = 0.2 Adc,)	$t_{d(on)}$	—	—	20	ns
Turn–Off Delay Time		$t_{d(off)}$	—	—	20	

(1) Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2%.
(2) Switching characteristics are independent of operating junction temperature.

TYPICAL ELECTRICAL CHARACTERISTICS

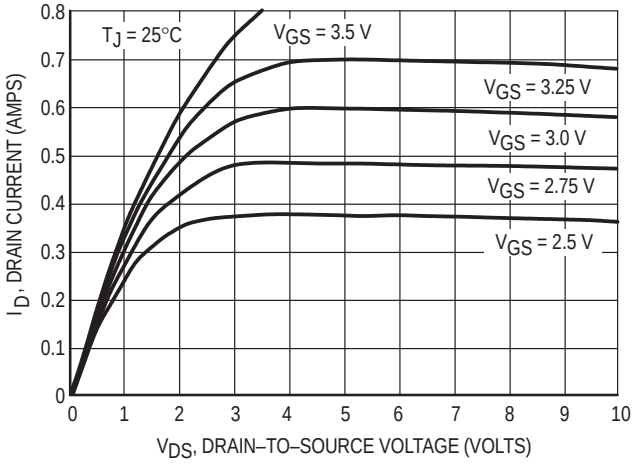


Figure 1. On–Region Characteristics

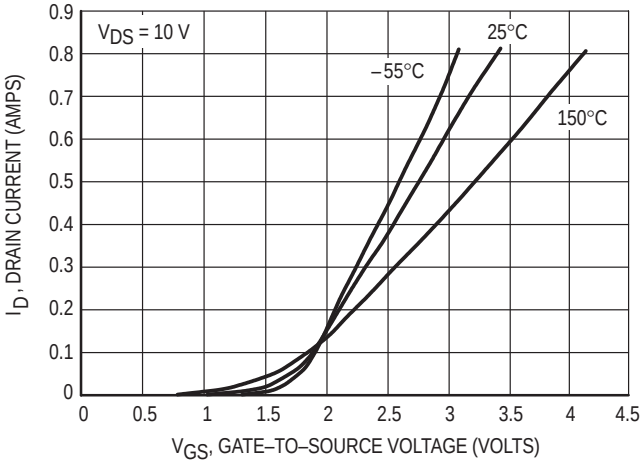


Figure 2. Transfer Characteristics

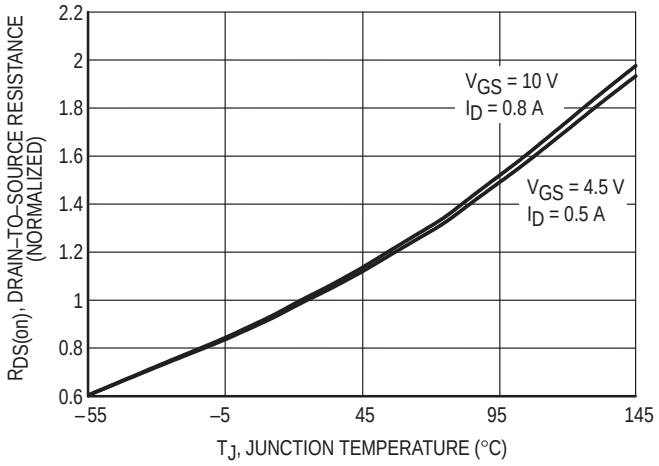


Figure 3. On–Resistance Variation with Temperature

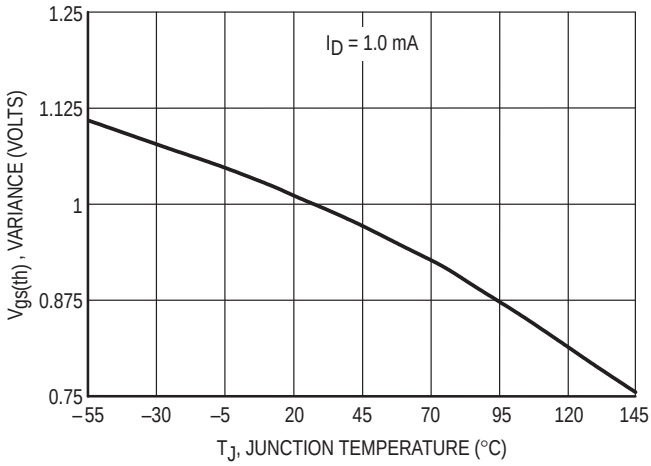


Figure 4. Threshold Voltage Variation with Temperature

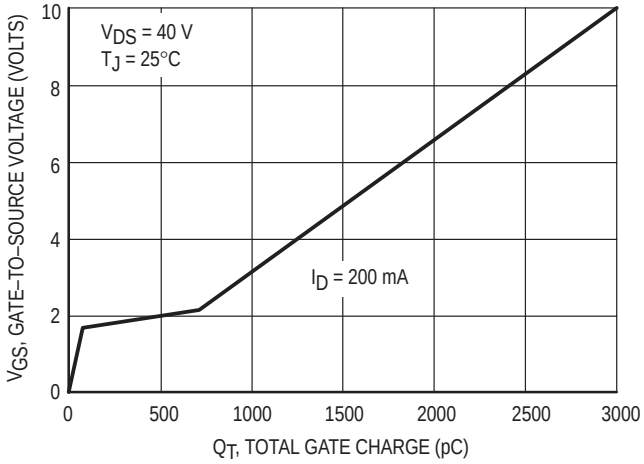


Figure 5. Gate Charge

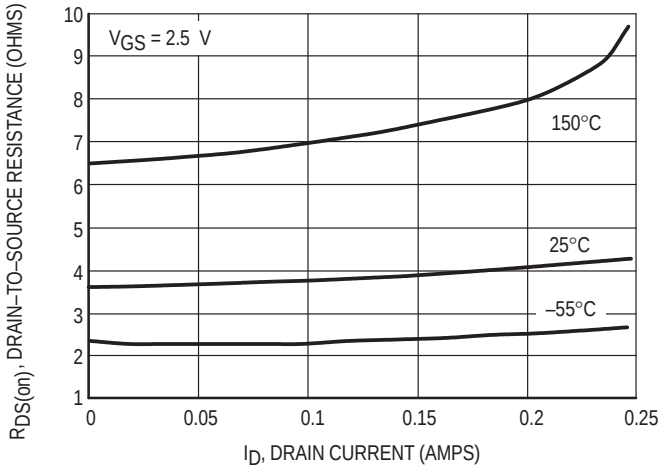


Figure 6. On–Resistance versus Drain Current

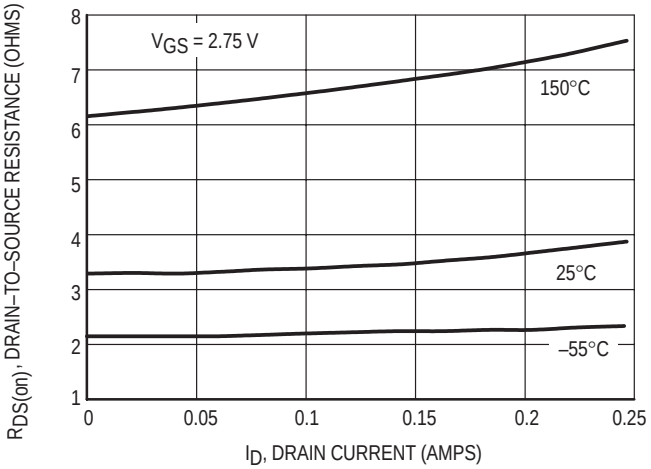


Figure 7. On–Resistance versus Drain Current

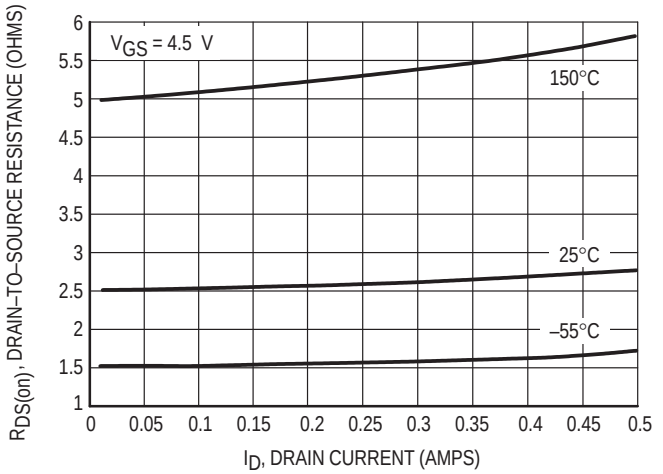


Figure 8. On–Resistance versus Drain Current

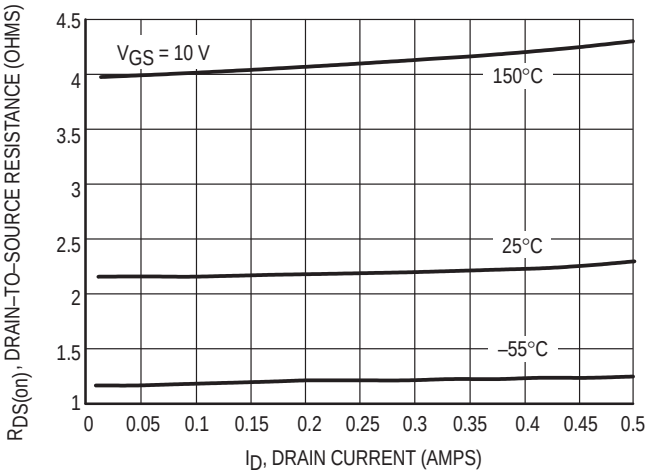


Figure 9. On–Resistance versus Drain Current

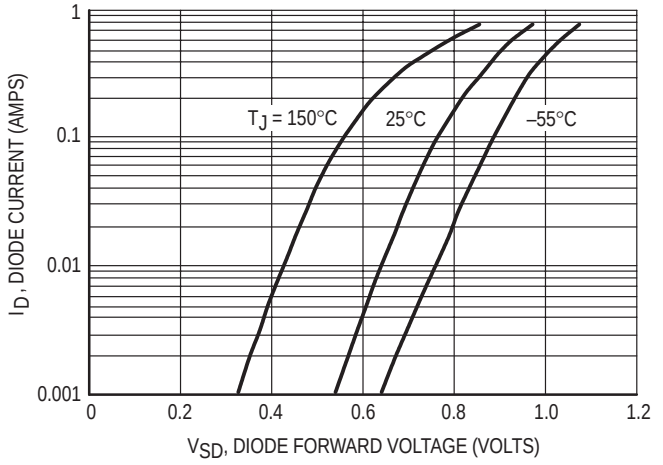


Figure 10. Body Diode Forward Voltage

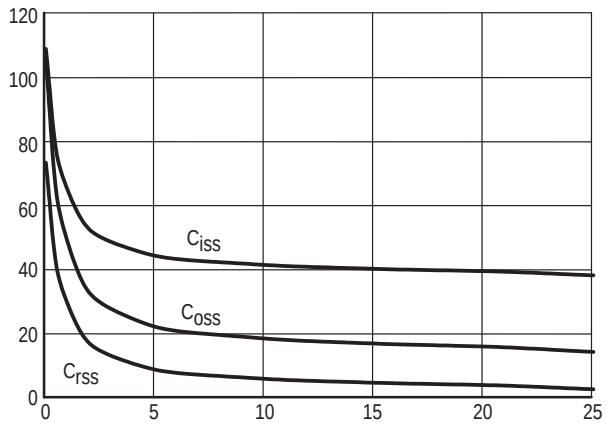


Figure 11. Capacitance