GREEN LINE™

Preliminary Information

Low $r_{DS(on)}$ Small-Signal MOSFETs TMOS Single P-Channel Field Effect Transistors

MGSF1P02ELT1

Motorola Preferred Device

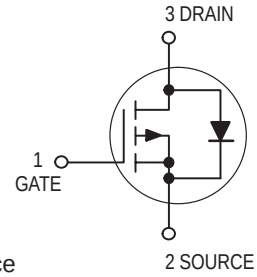
P–CHANNEL ENHANCEMENT–MODE TMOS MOSFET

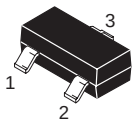
HD TMOS™

Part of the GreenLine™ Portfolio of devices with energy–conserving traits.

These miniature surface mount MOSFETs utilize Motorola's High Cell Density, HDTMOS process. Low $r_{DS(on)}$ assures minimal power loss and conserves energy, making this device ideal for use in space sensitive power management circuitry. Typical applications are dc–dc converters and power management in portable and battery–powered products such as computers, printers, PCMCIA cards, cellular and cordless telephones.

- Low $r_{DS(on)}$ Provides Higher Efficiency and Extends Battery Life
- Miniature SOT–23 Surface Mount Package Saves Board Space





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

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

Rating	Symbol	Value	Unit
Drain–to–Source Voltage	V_{DSS}	20	Vdc
Gate–to–Source Voltage — Continuous	V_{GS}	± 8.0	Vdc
Drain Current — Continuous @ T_A = 25°C — Pulsed Drain Current ($t_p \leq 10$ μs)	I_D I_{DM}	750 2000	mA
Total Power Dissipation @ T_A = 25°C	P_D	400	mW
Operating and Storage Temperature Range	T_J, T_{stg}	– 55 to 150	°C
Thermal Resistance — Junction–to–Ambient	$R_{\theta JA}$	300	°C/W
Maximum Lead Temperature for Soldering Purposes, 1/8″ from case for 10 seconds	T_L	260	°C

Device Marking: PC

ORDERING INFORMATION

Device	Reel Size	Tape Width	Quantity
MGSF1P02ELT1	7″	8mm embossed tape	3000
MGSF1P02ELT3	13″	8mm embossed tape	10,000

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

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)		$V_{(BR)DSS}$	20	—	—	Vdc
Zero Gate Voltage Drain Current		I_{DSS}				μAdc
(V_{DS} = 16 Vdc, V_{GS} = 0 Vdc)			—	—	1.0	
(V_{DS} = 16 Vdc, V_{GS} = 0 Vdc, T_J = 125°C)			—	—	10	
Gate–Body Leakage Current (V_{GS} = ± 8.0 Vdc, V_{DS} = 0 Vdc)		I_{GSS}	—	—	±100	nAdc
ON CHARACTERISTICS(1)						
Gate Threshold Voltage (V_{DS} = V_{GS}, I_D = 250 μAdc)		$V_{GS(th)}$	0.7	0.85	1.2	Vdc
Static Drain–to–Source On–Resistance		$r_{DS(on)}$				Ohms
(V_{GS} = 4.5 Vdc, I_D = 0.75 Adc)			—	0.20	0.26	
(V_{GS} = 2.5 Vdc, I_D = 0.5 Adc)			—	0.32	0.50	
DYNAMIC CHARACTERISTICS						
Input Capacitance	(V_{DS} = 5.0 Vdc)	C_{iss}	—	130	—	pF
Output Capacitance	(V_{DS} = 5.0 Vdc)	C_{oss}	—	120	—	
Transfer Capacitance	(V_{DG} = 5.0 Vdc)	C_{rss}	—	60	—	
SWITCHING CHARACTERISTICS(2)						
Turn–On Delay Time	(V_{DD} = 15 Vdc, I_D = 1.0 Adc, R_L = 50 Ω)	$t_{d(on)}$	—	2.5	—	ns
Rise Time		t_r	—	1.0	—	
Turn–Off Delay Time		$t_{d(off)}$	—	16	—	
Fall Time		t_f	—	8.0	—	
Gate Charge (See Figure 6)		Q_T	—	6000	—	pC
SOURCE–DRAIN DIODE CHARACTERISTICS						
Continuous Current		I_S	—	—	0.6	A
Pulsed Current		I_{SM}	—	—	0.75	
Forward Voltage(2)		V_{SD}	—	1.5	—	V

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