



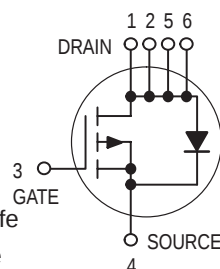
Preliminary Information

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

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

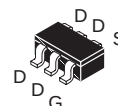
- Low $r_{DS(on)}$ Provides Higher Efficiency and Extends Battery Life
- Miniature TSOP 6 Surface Mount Package Saves Board Space
- Visit our Web Site at <http://www.mot-sps.com/ospd>



MGSF3441VT1

Motorola Preferred Device

P-CHANNEL
ENHANCEMENT-MODE
TMOS MOSFET
 $r_{DS(on)} = 78 \text{ m}\Omega$ (TYP)



CASE 318G-02, Style 1
TSOP 6 PLASTIC

2.5V RATED

MAXIMUM RATINGS ($T_J = 25^\circ\text{C}$ unless otherwise noted)

Rating	Symbol	Value	Unit
Drain-to-Source Voltage	V_{DS}	20	Vdc
Gate-to-Source Voltage — Continuous	V_{GS}	± 8.0	Vdc
Drain Current — Continuous @ $T_A = 25^\circ\text{C}$ — Pulsed Drain Current ($t_p \leq 10 \mu\text{s}$)	I_D I_{DM}	3.3 20	A
Total Power Dissipation @ $T_A = 25^\circ\text{C}$ Mounted on FR4 $t \leq 5 \text{ sec}$	P_D	2.0	W
Operating and Storage Temperature Range	T_J, T_{stg}	-55 to 150	$^\circ\text{C}$
Thermal Resistance — Junction-to-Ambient	$R_{\theta JA}$	128	$^\circ\text{C/W}$
Maximum Lead Temperature for Soldering Purposes, for 10 seconds	T_L	260	$^\circ\text{C}$

ORDERING INFORMATION

Device	Reel Size	Tape Width	Quantity
MGSF3441VT1	7"	8 mm embossed tape	3000
MGSF3441VT3	13"	8 mm embossed tape	10,000

This document contains information on a product under development. Motorola reserves the right to change or discontinue this product without notice.

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

MGSF3441VT1**ELECTRICAL CHARACTERISTICS** ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Drain-to-Source Breakdown Voltage ($V_{GS} = 0\text{ Vdc}$, $I_D = 10\text{ }\mu\text{A}$)	$V_{(BR)DSS}$	20	—	—	Vdc
Zero Gate Voltage Drain Current ($V_{DS} = 20\text{ Vdc}$, $V_{GS} = 0\text{ Vdc}$) ($V_{DS} = 20\text{ Vdc}$, $V_{GS} = 0\text{ Vdc}$, $T_J = 70^\circ\text{C}$)	I_{DSS}	— —	— —	1.0 4.0	μAdc
Gate-Body Leakage Current ($V_{GS} = \pm 8.0\text{ Vdc}$, $V_{DS} = 0$)	I_{GSS}	—	—	± 100	nAdc

ON CHARACTERISTICS(1)

Gate Threshold Voltage ($V_{DS} = V_{GS}$, $I_D = 250\text{ }\mu\text{Adc}$)	$V_{GS(th)}$	0.45	—	—	Vdc
Static Drain-to-Source On-Resistance ($V_{GS} = 4.5\text{ Vdc}$, $I_D = 3.3\text{ A}$) ($V_{GS} = 2.5\text{ Vdc}$, $I_D = 2.9\text{ A}$)	$r_{DS(on)}$	— —	0.078 0.110	0.090 0.135	Ohms

DYNAMIC CHARACTERISTICS

Input Capacitance	($V_{DS} = 5.0\text{ V}$)	C_{iss}	—	90	—	pF
Output Capacitance	($V_{DS} = 5.0\text{ V}$)	C_{oss}	—	50	—	
Transfer Capacitance	($V_{DG} = 5.0\text{ V}$)	C_{rss}	—	10	—	

SWITCHING CHARACTERISTICS(2)

Turn-On Delay Time	(V _{DD} = 15 Vdc, I _D = 1.0 A, V _{GEN} = 10 V, R _L = 10 Ω)	$t_{d(on)}$	—	27	50	ns
Rise Time		t_r	—	17	30	
Turn-Off Delay Time		$t_{d(off)}$	—	52	80	
Fall Time		t_f	—	45	70	
Gate Charge		Q_T	—	3000	—	pC

SOURCE-DRAIN DIODE CHARACTERISTICS

Continuous Current	I_S	—	—	1.0	A
Pulsed Current	I_{SM}	—	—	20	A
Forward Voltage(2)	V_{SD}	—	0.80	1.2	V

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

(2) Switching characteristics are independent of operating junction temperature.

TYPICAL ELECTRICAL CHARACTERISTICS

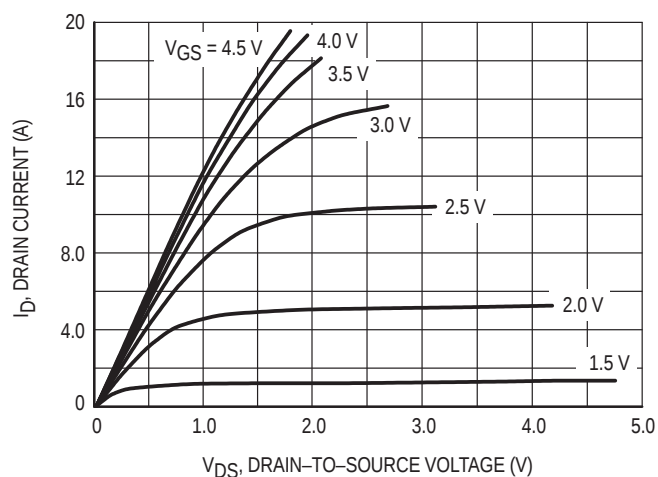


Figure 1. Output Characteristics

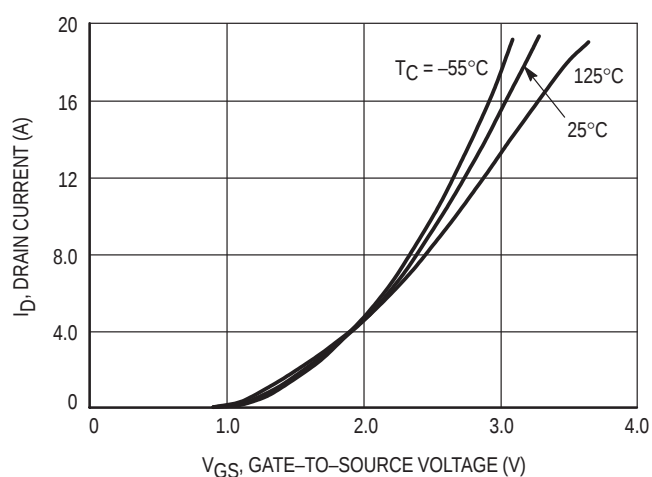


Figure 2. Transfer Characteristics

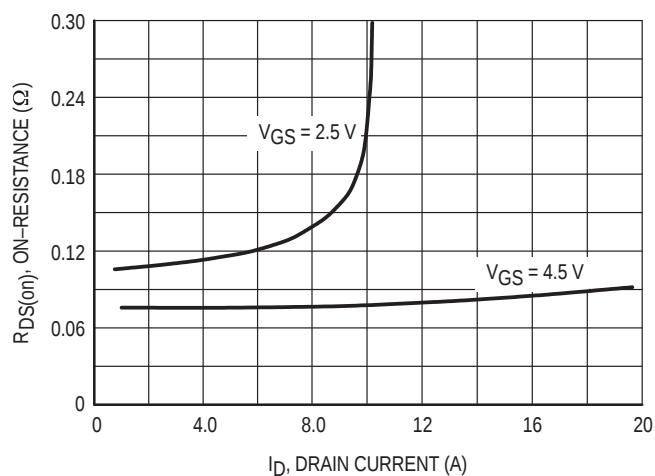


Figure 3. On-Resistance versus Drain Current

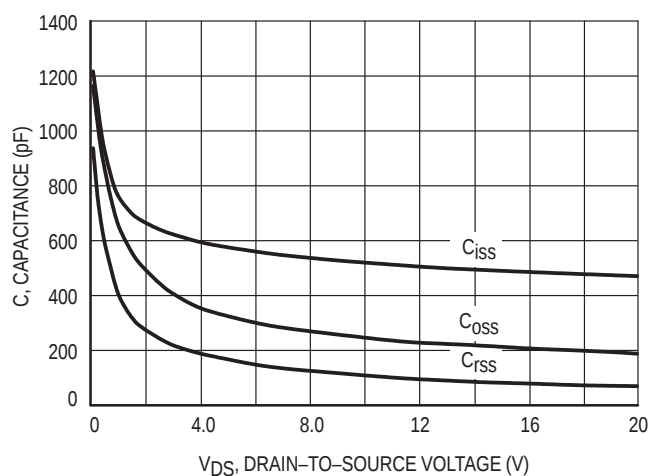


Figure 4. Capacitance

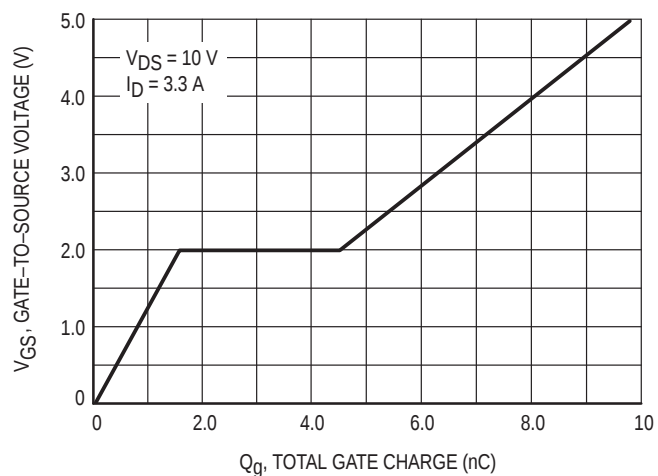


Figure 5. Gate Charge

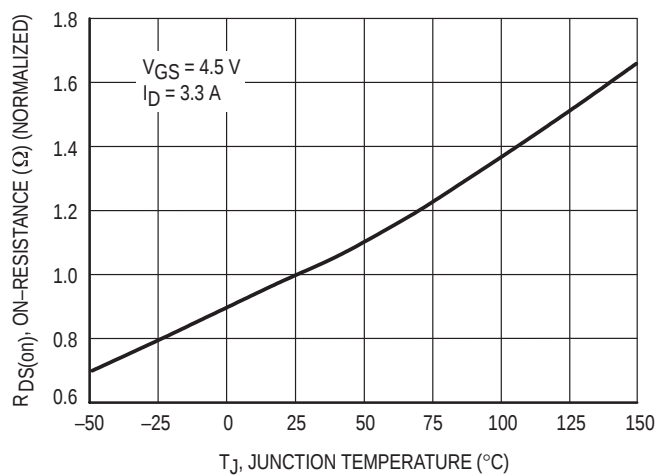


Figure 6. On-Resistance versus Junction Temperature

TYPICAL ELECTRICAL CHARACTERISTICS

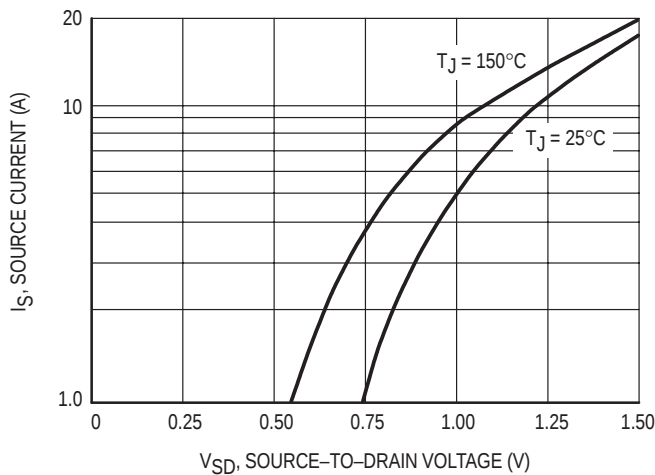


Figure 7. Source-Drain Diode Forward Voltage

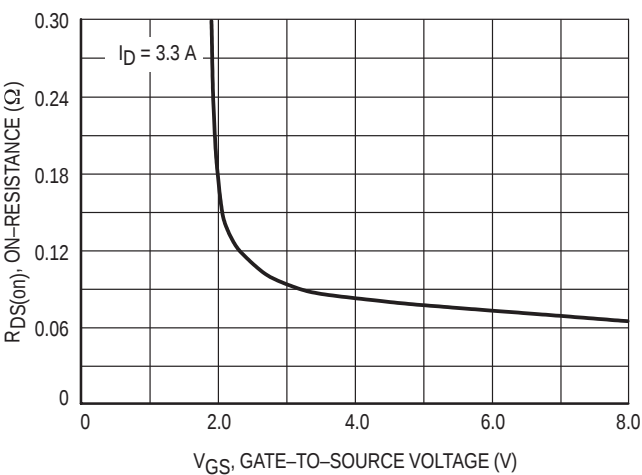


Figure 8. On-Resistance versus Gate-to-Source Voltage

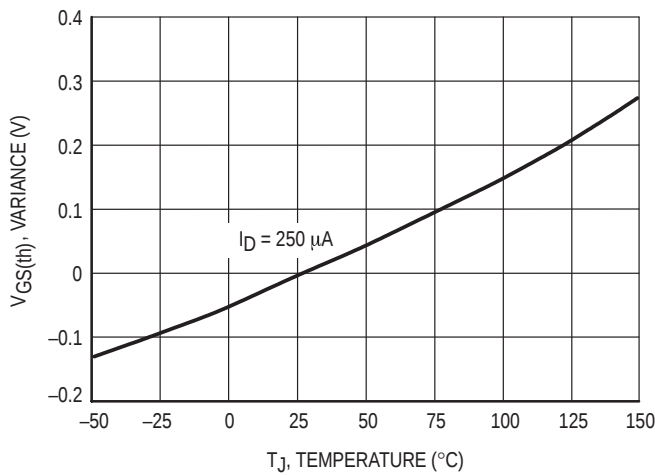


Figure 9. Threshold Voltage

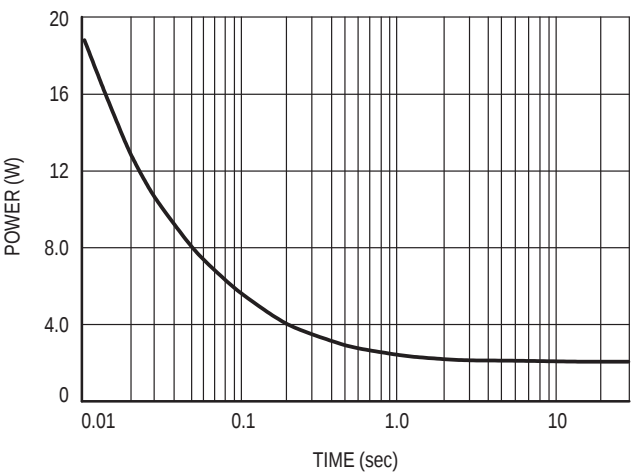


Figure 10. Single Pulse Power

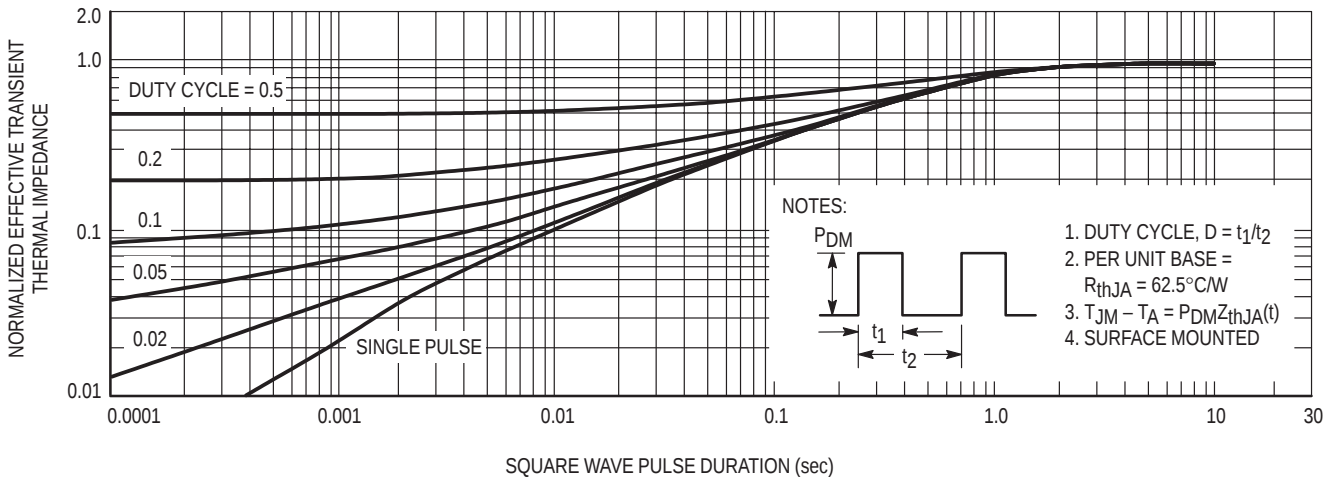


Figure 11. Normalized Thermal Transient Impedance, Junction-to-Ambient