

A0201

N-Channel Enhancement Mode MOSFET



Features

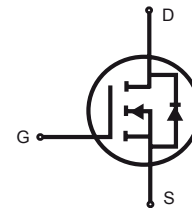
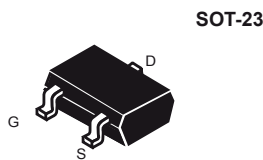
- Super high dense cell design for low $R_{DS(ON)}$
- Very fast switching
- Rugged and reliable
- SOT-23 surface mount package
- Lead (Pb) free product

Product Summary

V_{DS} (V)	I_D (A)	$R_{DS(ON)}$ (Ω) Max
20V	0.4A	1.3 @ $V_{GS} = 10V$
		1.7 @ $V_{GS} = 4.5V$

Applications

- Load switch
- Battery operated systems
- Logic level translator
- High speed line driver
- Solid state relays



Absolute Maximum Ratings ($T_A = 25^\circ C$ unless otherwise noted)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous @ $T_C = 25^\circ C$	I_D	0.4	A
-Pulsed ^b	I_{DM}	0.8	A
Drain-Source Diode Forward Current ^a	I_S	0.4	A
Maximum Power Dissipation ^a	P_D	0.35	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^\circ C$

Thermal Characteristics

Thermal Resistance, Junction-to-Ambient ^a	$R_{\theta JA}$	360	$^\circ C/W$
--	-----------------	-----	--------------

Electrical Characteristics (TA = 25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ ^c	Max	Unit
Static						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D = 10 μA	20			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 20V, V _{GS} =0V			1	μA
Gate-Body Leakage	I _{GSS}	V _{GS} = ± 20V, V _{DS} =0V			± 100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} I _D = 250 μA	1	1.5	2.5	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} = 10V, I _D = 0.3A			1.3	Ω
		V _{GS} = 4.5V, I _D = 0.1A			1.7	
On-State Drain Current	I _{D(ON)}	V _{DS} = 10V, V _{GS} = 10V	0.5			A
Forward Transconductance	g _{FS}	V _{DS} = 10V, I _D = 0.3A		350		mS
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _D = 0.3A		0.85	1.2	V

Dynamic

Input Capacitance	C _{ISS}	V _{DS} =12V V _{GS} =0V f=1.0MHz		30		pF
Output Capacitance	C _{OSS}			18		
Reverse Transfer Capacitance	C _{RSS}			7		
Turn-On Delay Time	t _{D(ON)}	V _D = 15V, I _D = 0.3A, V _{GEN} = 10V, R _{GEN} = 6Ω, R _L = 50Ω		3	7	ns
Rise Time	t _r			7	16	
Turn-Off Delay Time	t _{D(OFF)}			9	14	
Fall Time	t _f			7	11	
Total Gate Charge	Q _g	V _D = 16V, I _D = 0.3A, V _{GS} = 10V		800	1500	pC
Gate-Source Charge	Q _{gs}			150		
Gate-Drain Charge	Q _{gd}			140		

Notes:

- Surface Mounted on FR4 Board, t ≤ 10 sec.
- Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2%.
- Guaranteed by design, not subject to production testing.

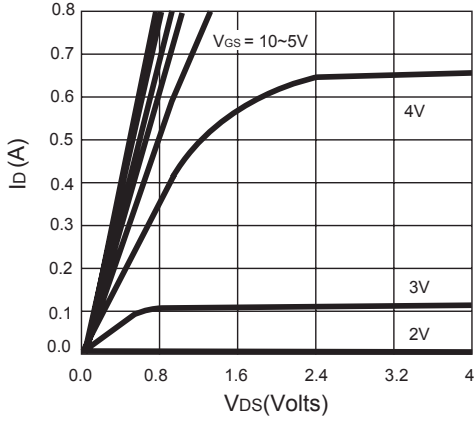


Figure 1. On-Regions Characteristics

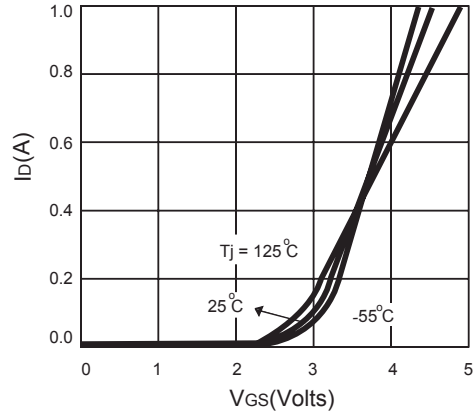


Figure 2. Transfer Characteristics

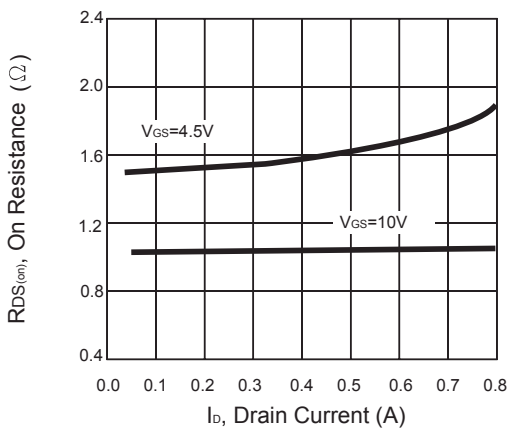


Figure 3. On Resistance Variation with Drain Current

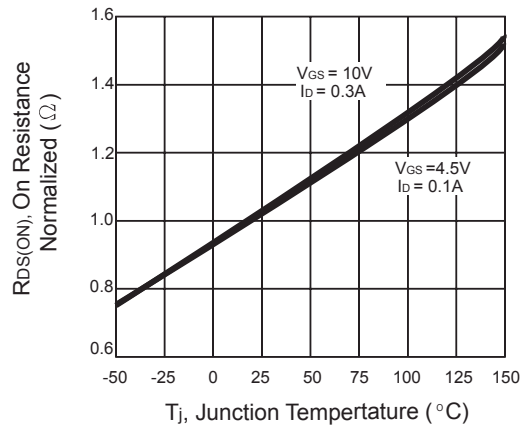


Figure 4. On Resistance Variation with Junction Temperature

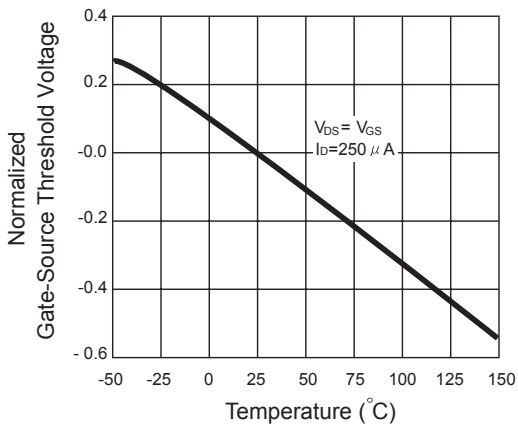


Figure 5. Gate Threshold vs. Junction Temperature

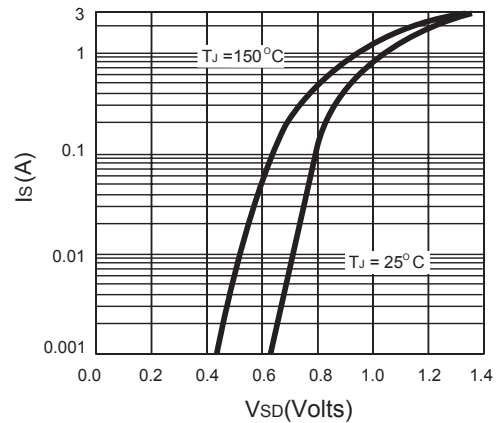


Figure 6. Body Diode Characteristics

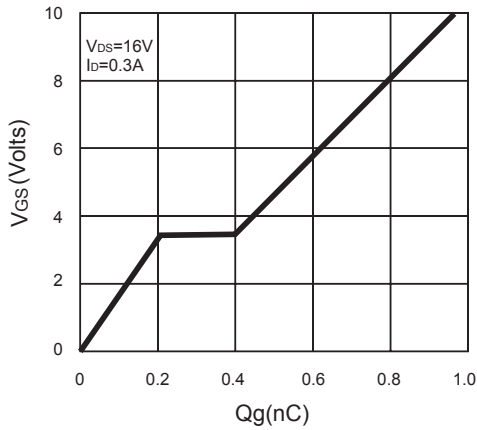


Figure 7. Gate-Charge Characteristics

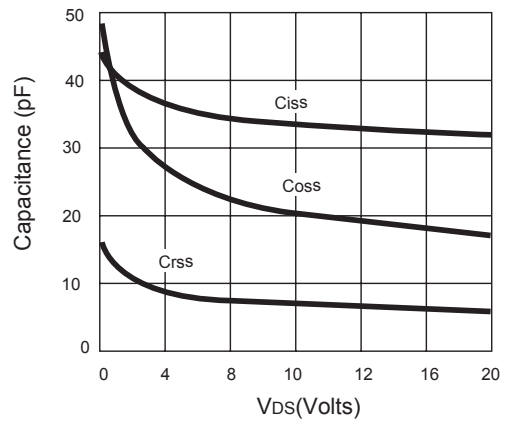


Figure 8. Capacitance Characteristics

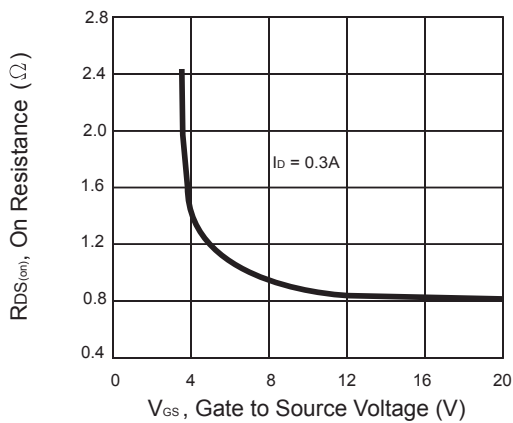


Figure 9. On Resistance Variation with Gate to Source Voltage

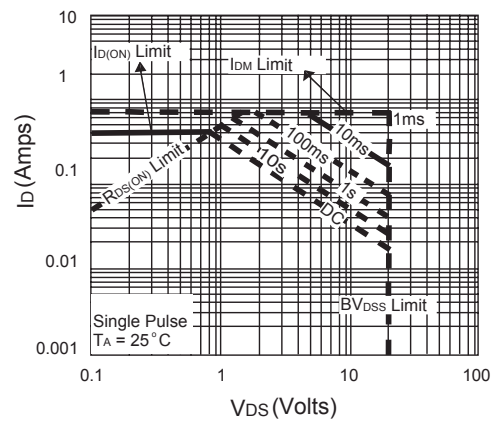


Figure 10. Maximum Forward Biased Safe Operating Area

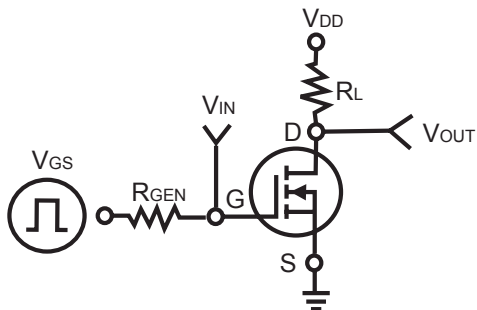


Figure 11. Switching Test Circuit

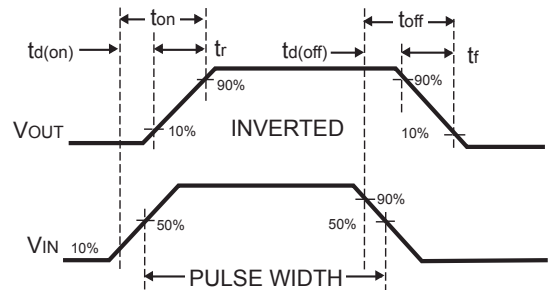


Figure 12. Switching Waveforms

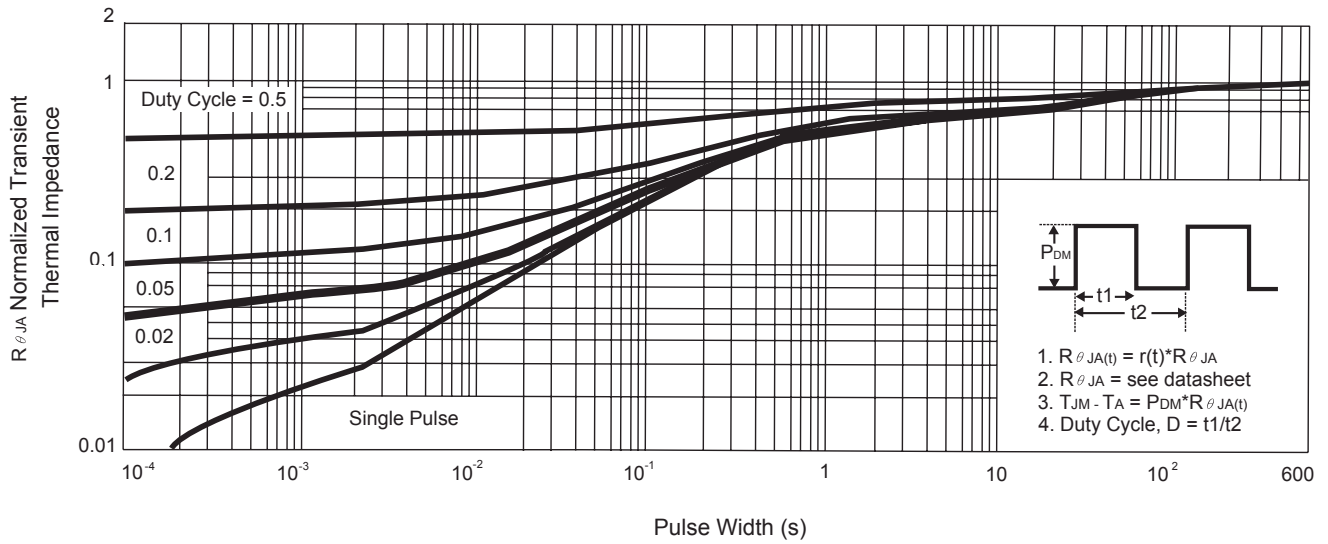


Figure 13. Normalized Maximum Transient Thermal Impedance