N-Channel Logic Level MOSFET

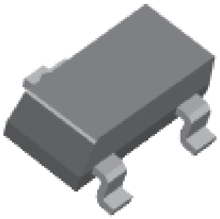
These miniature surface mount MOSFETs utilize High Cell Density process. Low $r_{DS(on)}$ assures minimal power loss and conserves energy, making this device ideal for use in power management circuitry. Typical applications are lower voltage application, power management in portable and battery-powered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

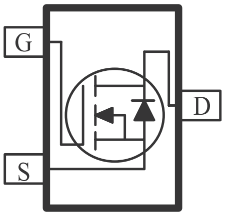
- Low $r_{DS(on)}$ Provides Higher Efficiency and Extends Battery Life
- Fast Switch
- Low Gate Charge
- Miniature SOT-23 Surface Mount Package Saves Board Space

PRODUCT SUMMARY

V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
30	0.065 @ V_{GS} = 4.5V	2.2
	0.082 @ V_{GS} = 2.5V	2.0

2.5-V Rated





ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C UNLESS OTHERWISE NOTED)

Parameter		Symbol	Maximum	Units
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	±8	
Continuous Drain Current[a]	T_A=25°C	I_D	2.2	A
	T_A=70°C		1.7	
Pulsed Drain Current[b]		I_{DM}	10	
Continuous Source Current (Diode Conduction)[a]		I_S	0.45	A
Power Dissipation[a]	T_A=25°C	P_D	0.5	W
	T_A=70°C		0.42	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 150	°C

THERMAL RESISTANCE RATINGS

Parameter		Symbol	Maximum	Units
Maximum Junction-to-Ambient[a]	t <= 5 sec	R_{THJA}	250	°C/W
	Steady-State		285	

Notes

a. Surface Mounted on 1” x 1” FR4 Board.

b. Pulse width limited by maximum junction temperature

SPECIFICATIONS (T_A = 25°C UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Conditions	Limits			Unit
			Min	Typ	Max	
Switch Off Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0 V, I_D = 250 uA	30			
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 24 V, V_{GS} = 0 V			1	µA
		V_{DS} = 24 V, V_{GS} = 0 V, T_J = 55°C			10	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±8 V			±100	nA
Switch On Characteristics						
Gate-Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 uA	0.43	0.7	1.0	V
On-State Drain Current[A]	$I_{D(on)}$	V_{DS} = 5 V, V_{GS} = 4.5 V	10			A
Drain-Source On-Resistance[A]	$r_{DS(on)}$	V_{GS} = 4.5 V, I_D = 2.2 A		54	65	mΩ
		V_{GS} = 4.5 V, I_D = 2.2 A TJ = 55°C		80	99	
		V_{GS} = 2.5 V, I_D = 2.0 A		70	82	
Forward Tranconductance[A]	g_{fs}	V_{DS} = 5 V, I_D = 2.2 A		13		S
Diode Forward Voltage	V_{SD}	I_S = 0.45 A, V_{GS} = 0 V		0.65	1.2	V
Dynamic[b]						
Total Gate Charge	Q_g	V_{DS} = 10 V, V_{GS} = 4.5 V, I_D = 2.2 A		7.0	9.0	nC
Gate-Source Charge	Q_{gs}			1.1		
Gate-Drain Charge	Q_{gd}			1.9		
Switching						
Turn-On Delay Time	$t_{d(on)}$	V_{DS} = 10 V, I_D = 1 A, R_G = 6 Ω, V_{GEN} = 4.5 V		4	11	ns
Rise Time	t_r			11	19	
Turn-Off Delay Time	$t_{d(off)}$			18	30	
Fall-Time	t_f			5	10	

Notes

a. Pulse test: PW <= 300us duty cycle <= 2%.

b. Guaranteed by design, not subject to production testing.

Typical Electrical Characteristics

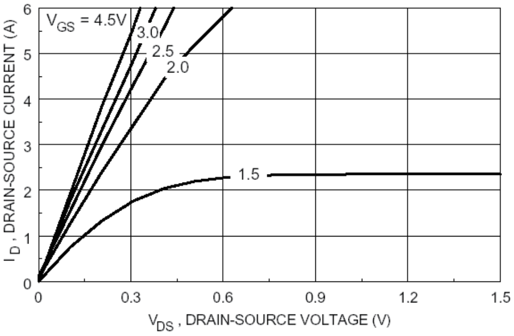


Figure 1. On-Region Characteristics

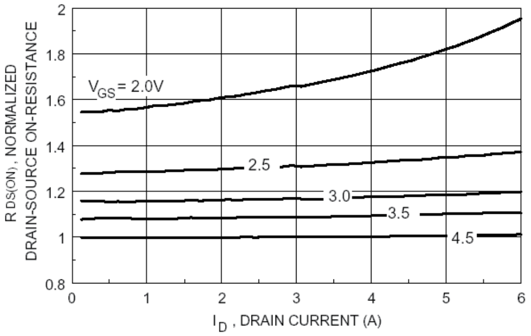


Figure 2. On-Resistance Variation with Drain Current and Gate Voltage

Figure 3. On-Resistance Variation

with Temperature

Figure 4. On-Resistance Variation with Gate to Source Voltage

Figure 5. Transfer Characteristics

Figure 6. Body Diode Forward Voltage Variation with Source Current and Temperature

Typical Electrical Characteristics

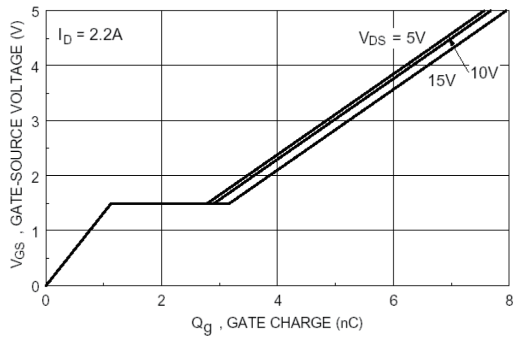


Figure 7. Gate Charge Characteristics.

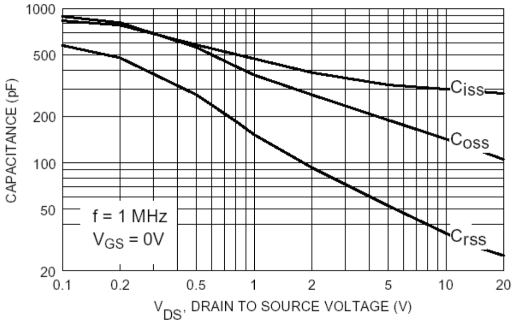


Figure 8. Capacitance Characteristics.

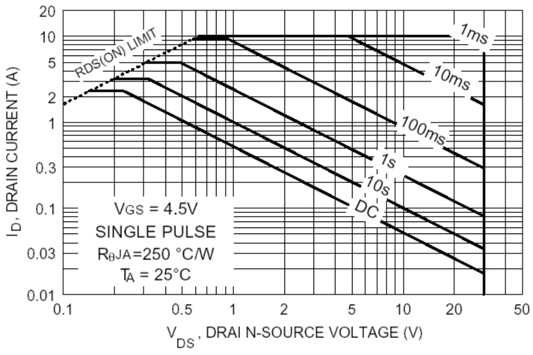


Figure 9. Maximum Safe Operating Area.

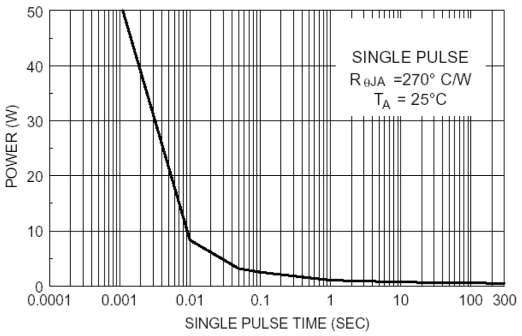
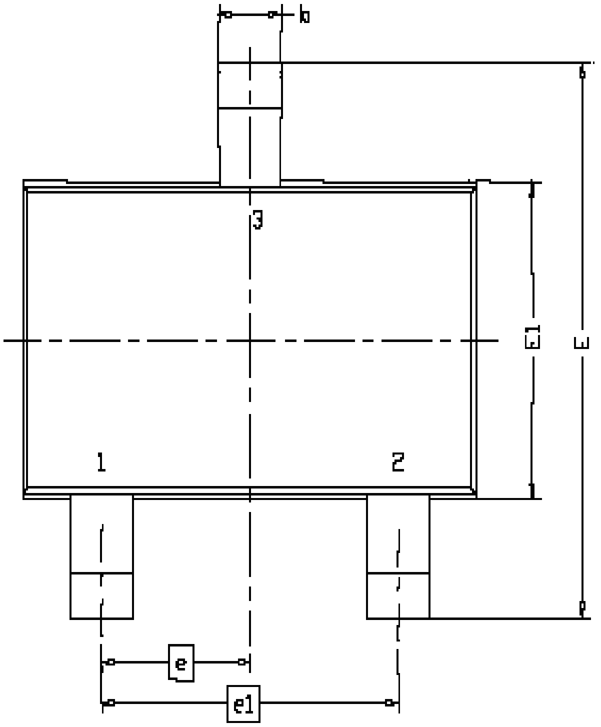


Figure 10. Single Pulse Maximum Power Dissipation.

Normalized Thermal Transient Impedance, Junction to Ambient

Figure 11. Transient Thermal Response Curve

Package Information



DIM.	MILLIMETERS		
	MIN	NOM	MAX
A	0.935	0.95	1.10
A1	0.01	---	0.10
A2	0.85	0.90	0.925
b	0.30	0.40	0.50
c	0.10	0.15	0.25
D	2.70	2.90	3.10
E	2.60	2.80	3.00
E1	1.40	1.60	1.80
e	0.95 BSC		
e1	1.90 BSC		
L	0.30	0.40	0.60
L1	0.60REF		
L2	0.25BSC		
R	0.10	---	---
θ	0°	4°	8°
θ1	7°NOM