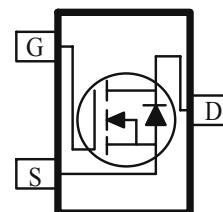
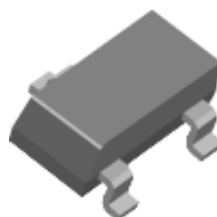


**N-Channel Logic Level MOSFET**

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



ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ C$ UNLESS OTHERWISE NOTED)				
Parameter		Symbol	Maximum	Units
Drain-Source Voltage		$V_{DS}$	30	V
Gate-Source Voltage		$V_{GS}$	$\pm 8$	
Continuous Drain Current <sup>a</sup>	$T_A = 25^\circ C$	$I_D$	2.2	A
	$T_A = 70^\circ C$		1.7	
Pulsed Drain Current <sup>b</sup>		$I_{DM}$	10	
Continuous Source Current (Diode Conduction) <sup>a</sup>		$I_S$	0.45	A
Power Dissipation <sup>a</sup>	$T_A = 25^\circ C$	$P_D$	0.5	W
	$T_A = 70^\circ C$		0.42	
Operating Junction and Storage Temperature Range		$T_J, T_{stg}$	-55 to 150	$^\circ C$

THERMAL RESISTANCE RATINGS				
Parameter		Symbol	Maximum	Units
Maximum Junction-to-Ambient <sup>a</sup>	$t \leq 5$ sec	$R_{THJA}$	250	$^\circ C/W$
	Steady-State		285	

Notes

- a. Surface Mounted on 1" x 1" FR4 Board.
- b. Pulse width limited by maximum junction temperature

SPECIFICATIONS ( $T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Conditions	Limits			Unit
			Min	Typ	Max	
<b>Switch Off Characteristics</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	30			
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 24\text{ V}, V_{GS} = 0\text{ V}$			1	$\mu\text{A}$
		$V_{DS} = 24\text{ V}, V_{GS} = 0\text{ V}, T_J = 55^\circ\text{C}$			10	
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0\text{ V}, V_{GS} = \pm 8\text{ V}$			$\pm 100$	$\text{nA}$
<b>Switch On Characteristics</b>						
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	0.43	0.7	1.0	V
On-State Drain Current <sup>A</sup>	$I_{D(on)}$	$V_{DS} = 5\text{ V}, V_{GS} = 4.5\text{ V}$	10			A
Drain-Source On-Resistance <sup>A</sup>	$r_{DS(on)}$	$V_{GS} = 4.5\text{ V}, I_D = 2.2\text{ A}$		54	65	$\text{m}\Omega$
		$V_{GS} = 4.5\text{ V}, I_D = 2.2\text{ A}, T_J = 55^\circ\text{C}$		80	99	
		$V_{GS} = 2.5\text{ V}, I_D = 2.0\text{ A}$		70	82	
Forward Transconductance <sup>A</sup>	$g_{fs}$	$V_{DS} = 5\text{ V}, I_D = 2.2\text{ A}$		13		S
Diode Forward Voltage	$V_{SD}$	$I_S = 0.45\text{ A}, V_{GS} = 0\text{ V}$		0.65	1.2	V
<b>Dynamic<sup>b</sup></b>						
Total Gate Charge	$Q_g$	$V_{DS} = 10\text{ V}, V_{GS} = 4.5\text{ V},$ $I_D = 2.2\text{ A}$		7.0	9.0	$\text{nC}$
Gate-Source Charge	$Q_{gs}$			1.1		
Gate-Drain Charge	$Q_{gd}$			1.9		
<b>Switching</b>						
Turn-On Delay Time	$t_{d(on)}$	$V_{DS} = 10\text{ V}, I_D = 1\text{ A}, R_G = 6\text{ }\Omega,$ $V_{GEN} = 4.5\text{ V}$		4	11	$\text{ns}$
Rise Time	$t_r$			11	19	
Turn-Off Delay Time	$t_{d(off)}$			18	30	
Fall-Time	$t_f$			5	10	

## Notes

- Pulse test:  $PW \leq 300\text{ }\mu\text{s}$  duty cycle  $\leq 2\%$ .
- Guaranteed by design, not subject to production testing.

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## Typical Electrical Characteristics

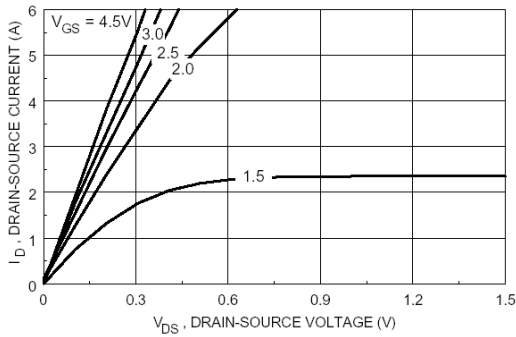


Figure 1. On-Region Characteristics

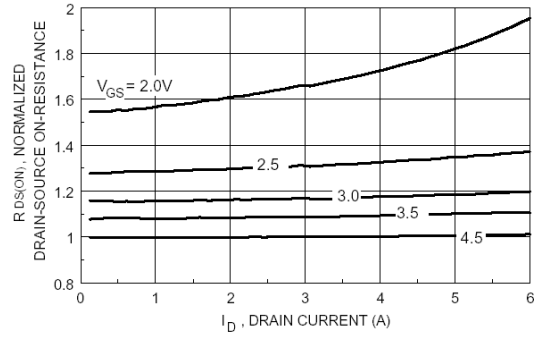


Figure 2. On-Resistance Variation with Drain Current and Gate Voltage

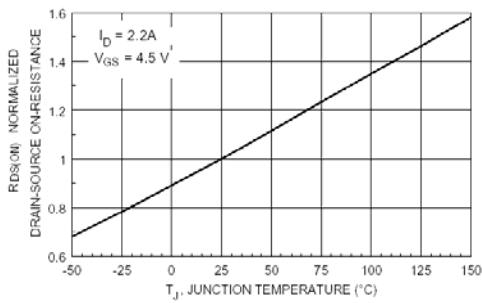


Figure 3. On-Resistance Variation with Temperature

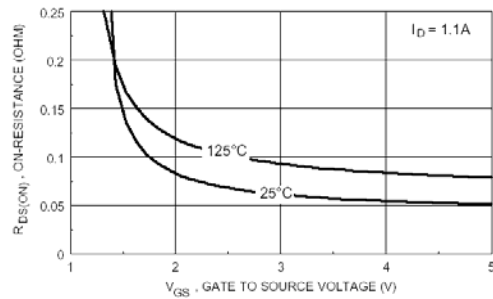


Figure 4. On-Resistance Variation with Gate to Source Voltage

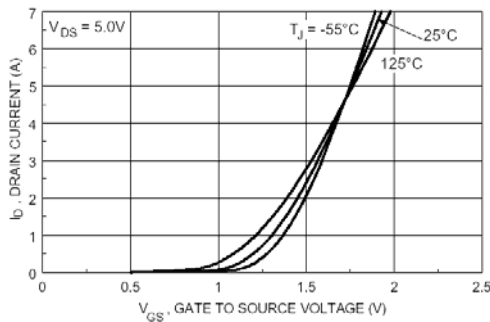


Figure 5. Transfer Characteristics

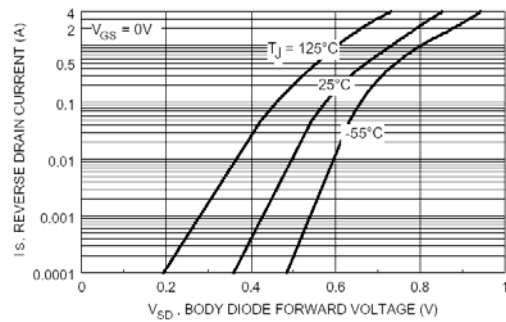


Figure 6. Body Diode Forward Voltage Variation with Source Current and Temperature

### Typical Electrical Characteristics

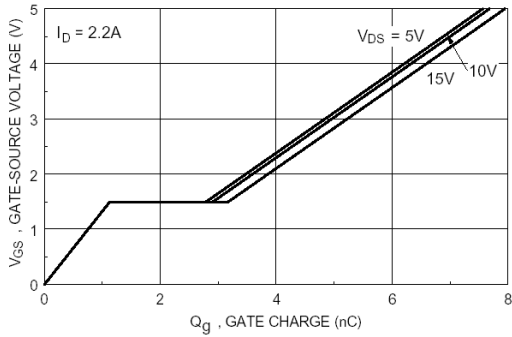


Figure 7. Gate Charge Characteristics.

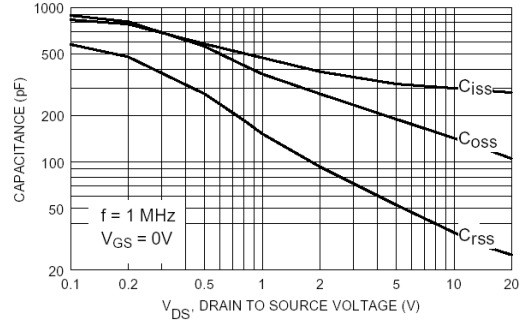


Figure 8. Capacitance Characteristics.

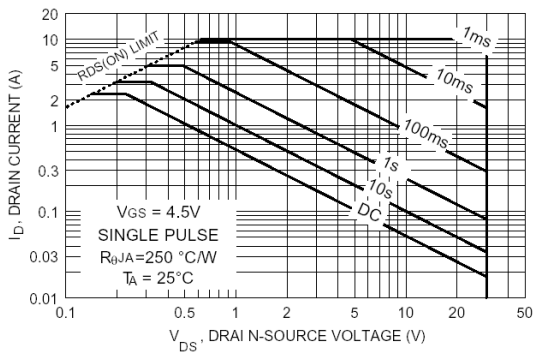


Figure 9. Maximum Safe Operating Area.

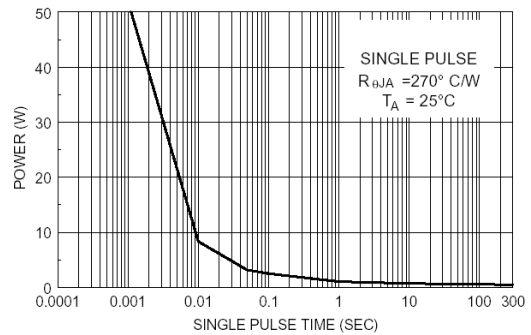


Figure 10. Single Pulse Maximum Power Dissipation.

### Normalized Thermal Transient Impedance, Junction to Ambient

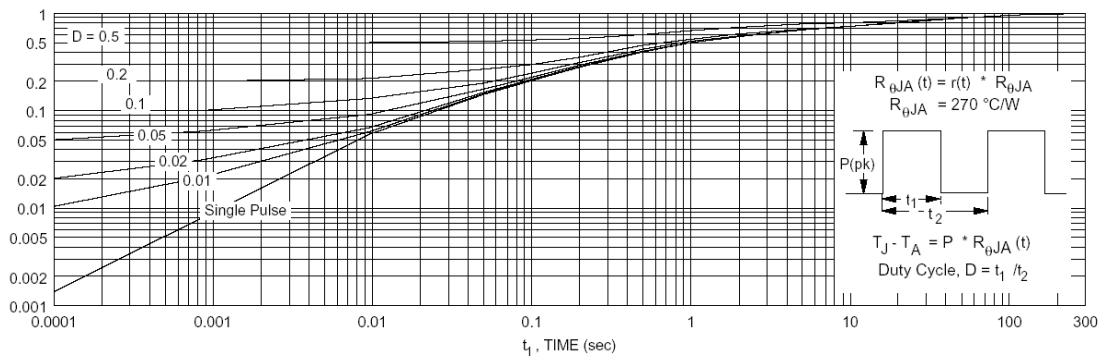
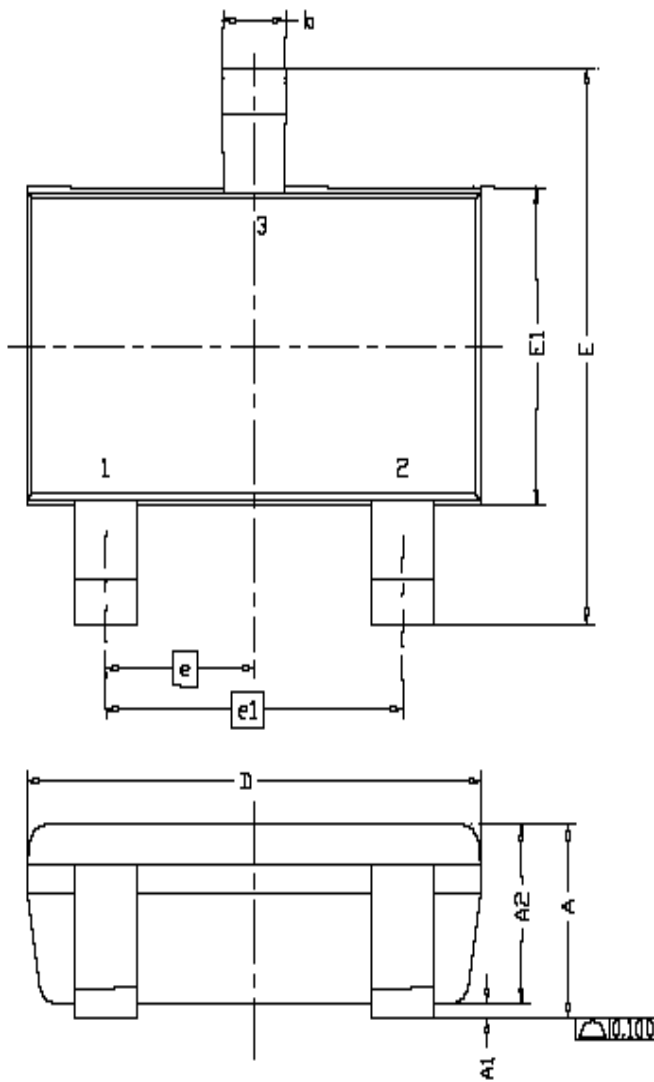


Figure 11. Transient Thermal Response Curve

# 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	---	---
$\theta$	0°	4°	8°
$\theta_1$	7°NOM		

