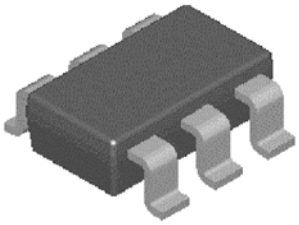
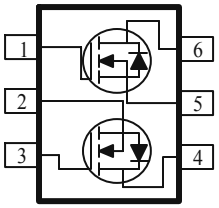
Dual N-Channel Logic Level MOSFET

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 logic switch control, power management in portable and battery-powered products such as computers, printers, PCMCIA cards, cellular and cordless telephones.

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (OHM)	I_D (A)
25	0.45 @ V_{GS} = 4.5 V	0.5
	0.63 @ V_{GS} = 2.5V	0.2

- Low $r_{DS(on)}$ Provides Higher Efficiency and Extends Battery Life
- Miniature TSOP-6 Surface Mount Package Saves Board Space
- Very fast switching
- Gate to Source Zener Diode ESD Protect





ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C UNLESS OTHERWISE NOTED)				
Parameter		**Symbol**	**Maximum**	**Units**
Drain-Source Voltage		V_{DS}	25	V
Gate-Source Voltage		V_{GS}	8	
Continuous Drain Current[a]	T_A=25°C	I_D	0.7	A
	T_A=70°C		0.58	
Pulsed Drain Current[b]		I_{DM}	2	
Continuous Source Current (Diode Conduction)[a]		I_S	±0.3	A
Power Dissipation[a]	T_A=25°C	P_D	0.9	W
	T_A=70°C		0.7	
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	$R_{\theta JA}$	140	°C/W
	Steady-State		180	

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**	
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0 V, I_D = 250 uA	25			V
Gate-Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = -250 uA	0.67	0.85	1.5	
Gate-Body Leakage	I_{GSS}	V_{DS} = 20 V, V_{GS} = 0 V			100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 20 V, V_{GS} = 0 V			1	uA
		V_{DS} = 20 V, V_{GS} = 0 V, T_J = 55°C			10	
On-State Drain Current[A]	$I_{D(on)}$	V_{DS} = 5 V, V_{GS} = 2.5 V	0.5			A
Drain-Source On-Resistance[A]	$r_{DS(on)}$	V_{GS} = 4.5 V, I_D = 0.5 A		0.33	0.45	Ω
		V_{GS} = 4.5 V, I_D = 0.5 A TJ = 55°C		0.36	0.49	
		V_{GS} = 2.5 V, I_D = 0.2 A		0.45	0.63	
Forward Tranconductance[A]	g_{fs}	V_{DS} = 5 V, I_D = 0.5 A		1.5		S
Diode Forward Voltage	V_{SD}	I_S = 0.5 A, V_{GS} = 0 V		0.85	1.20	V
Dynamic[b]						
Total Gate Charge	Q_g	V_{DS} = 5 V, V_{GS} = 4.5 V, I_D = 0.5 A		1.7	2.3	nC
Gate-Source Charge	Q_{gs}			0.38	0.72	
Gate-Drain Charge	Q_{gd}			0.47	0.87	
Switching						
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 6 V, I_D = 0.5 A, V_{GEN} = 4.5 V, R_G = 50 Ω		6.5	13	ns
Rise Time	t_r			11	19	
Turn-Off Delay Time	$t_{d(off)}$			13	24	
Fall-Time	t_f			3	7	

Notes

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

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

Typical Electrical Characteristics

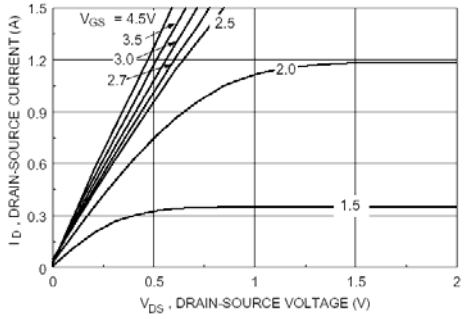


Figure 1. On-Region Characteristics

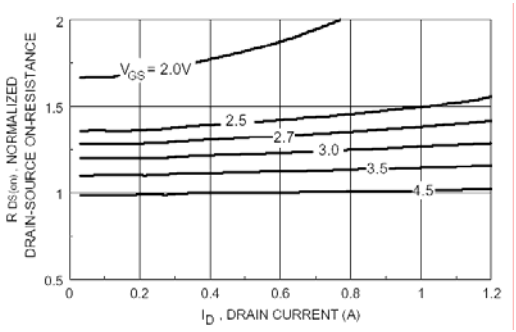


Figure 2. On-Resistance Variation with Drain Current and Gate Voltage

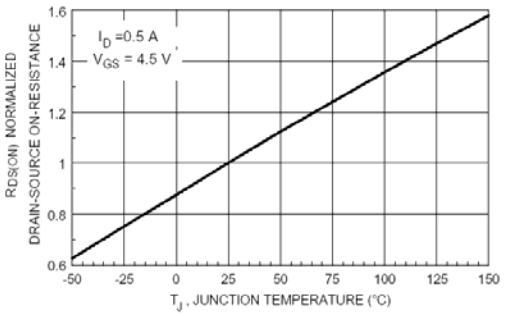


Figure 3. On-Resistance Variation with Temperature

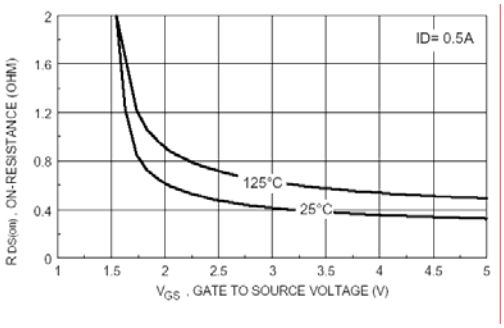


Figure 4. On-Resistance Variation with Gate to Source Voltage

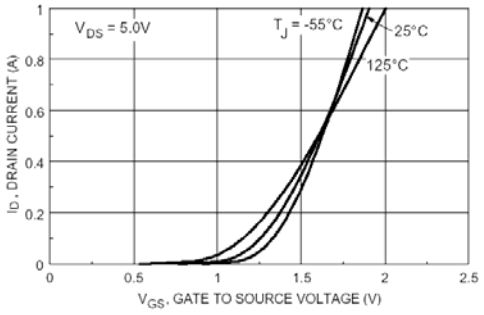


Figure 5. Transfer Characteristics

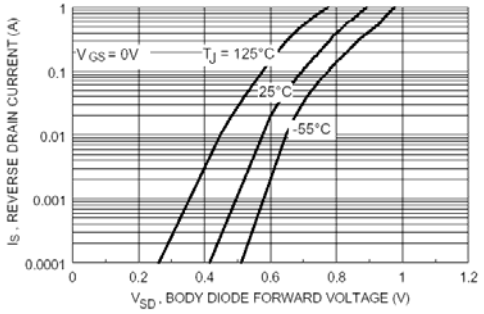


Figure 6. Body Diode Forward Voltage Variation with Source Current and Temperature

Typical Electrical Characteristics

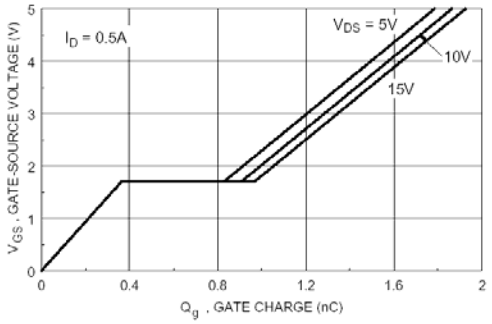


Figure 7. Gate Charge Characteristics.

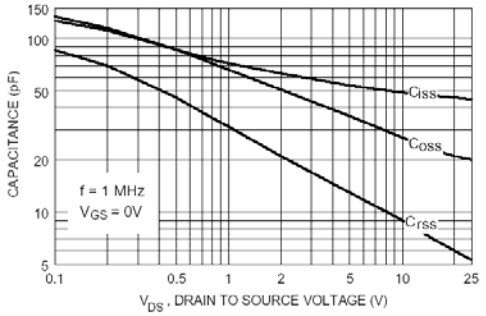


Figure 8. Capacitance Characteristics.

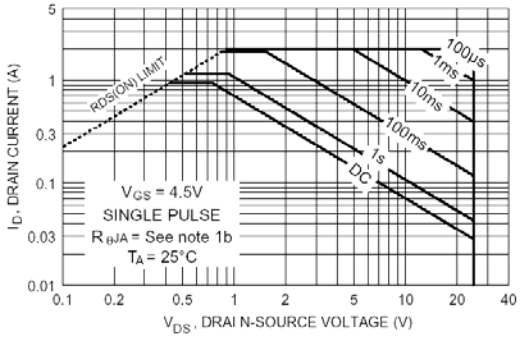


Figure 9. Maximum Safe Operating Area

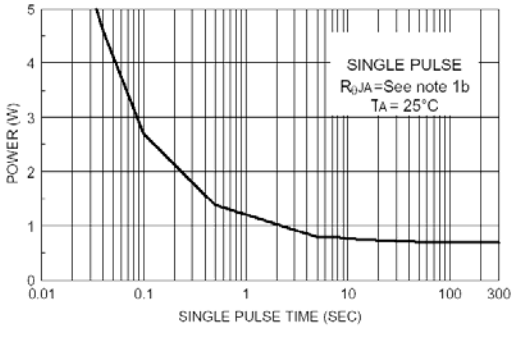


Figure 10. Single Pulse Maximum Power Dissipation

Normalized Thermal Transient Junction to Ambient

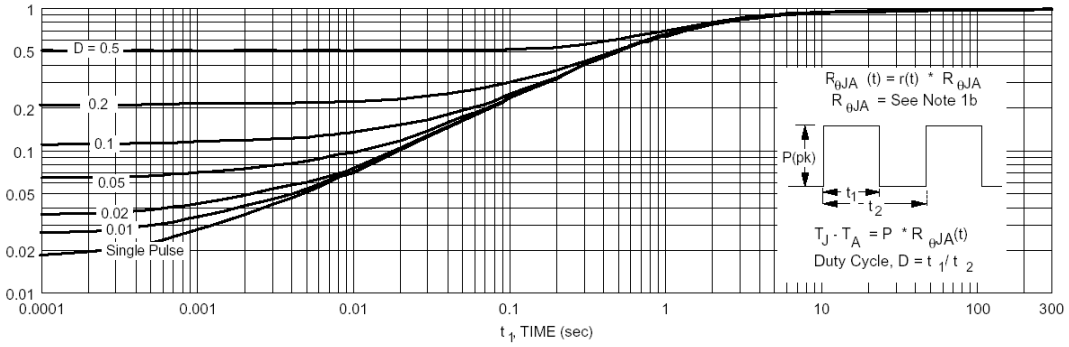
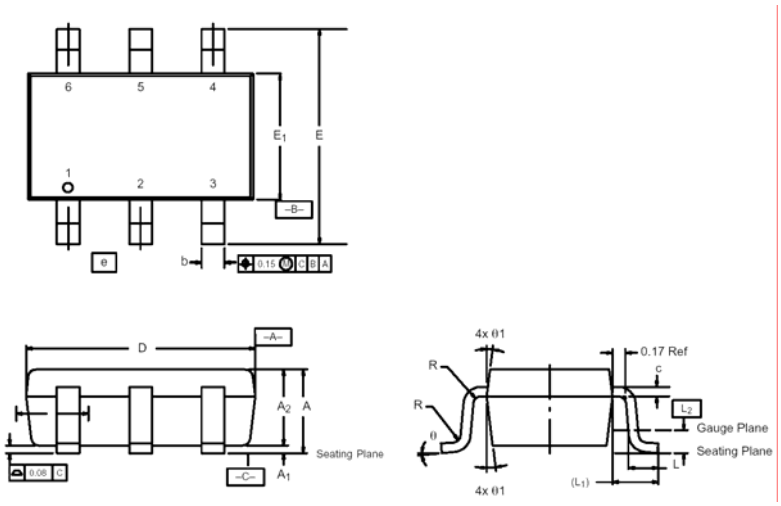


Figure 11. Transient Thermal Response Curve

Package Information

TSOP-6: 6LEAD



Dim	MILLIMETERS			INCHES		
	Min	Nom	Max	Min	Nom	Max
A	0.91	–	1.10	0.036	–	0.043
A_1	0.01	–	0.10	0.0004	–	0.004
A_2	0.84	–	1.00	0.033	0.038	0.039
b	0.30	0.32	0.45	0.012	0.013	0.018
c	0.10	0.15	0.20	0.004	0.006	0.008
D	2.95	3.05	3.10	0.116	0.120	0.122
E	2.70	2.85	2.98	0.106	0.112	0.117
E_1	1.55	1.65	1.70	0.061	0.065	0.067
e	1.00 BSC			0.0394 BSC		
L	0.35	–	0.50	0.014	–	0.020
L_1	0.60 Ref			0.024 Ref		
L_2	0.25 BSC			0.010 BSC		
R	0.10	–	–	0.004	–	–
θ	0°	4°	8°	0°	4°	8°
$θ_1$	7° Nom			7° Nom		