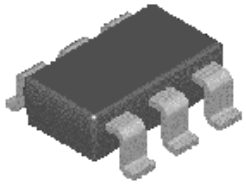
N & P-Channel 25-V (D-S) MOSFET

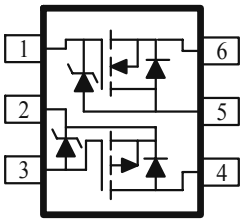
These miniature surface mount MOSFETs utilize High Cell Density process. Low $r_{DS(on)}$ assures minimal power loss and conserves energy, making this device ideal for use in power management circuitry. Typical applications are DC-DC converters, power management in portable and battery-powered products 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

V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
25	0.45 @ V_{GS} = 4.5V	1.2
	0.72 @ V_{GS} = 2.5V	1.0
-25	1.00 @ V_{GS} = -4.5V	-0.85
	1.50 @ V_{GS} = -2.5V	-0.75

2.5 V Rated





ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C UNLESS OTHERWISE NOTED)					
Parameter		**Symbol**	**N-Channel**	**P-Channel**	**Units**
Drain-Source Voltage		V_{DS}	25	-25	V
Gate-Source Voltage		V_{GS}	8	-8	
Continuous Drain Current[a]	T_A=25°C	I_D	1.2	-0.9	A
	T_A=70°C		0.95	-0.65	
Pulsed Drain Current[b]		I_{DM}	±3.5	±2.5	
Continuous Source Current (Diode Conduction)[a]		I_S	1	-1	A
Power Dissipation[a]	T_A=25°C	P_D	1.25		W
	T_A=70°C		0.8		
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}	100	°C/W

Notes

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

b. Pulse width limited by maximum junction temperature

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PRELIMINARY

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SPECIFICATIONS (T_A = 25°C UNLESS OTHERWISE NOTED)							
Parameter	**Symbol**	**Test Conditions**	**Limits**				**Unit**
			Ch	**Min**	**Typ**	**Max**	
Static							
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0 V, I_D = 250 uA	N	25			V
		V_{GS} = 0 V, I_D = -250 uA	P	-25			
Gate-Threshold Voltage	$V_{GS(th)}$	V_{GS} = V_{DS}, I_D = 250 uA	N	0.65	0.81	1.5	V
		V_{GS} = V_{DS}, I_D = -250 uA	P	-0.65	-0.83	-1.5	
Gate-Body Leakage Current	I_{GSS}	V_{DS} = 0 V, V_{GS} = 8 V	N			100	uA
		V_{DS} = 0 V, V_{GS} = -8 V	P			-100	
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 20 V, V_{GS} = 0 V	N			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} = 4.5 V	N	1			A
		V_{DS} = -5 V, V_{GS} = -4.5 V	P	-1			
Drain-Source On-Resistance[A]	$r_{DS(on)}$	V_{GS} = 4.5 V, I_D = 0.5 A	N		0.35	0.45	Ω
		V_{GS} = 2.5 V, I_D = 0.2 A			0.45	0.72	
		V_{GS} = -4.5 V, I_D = -0.41 A	P		0.860	1.09	
		V_{GS} = -2.5 V, I_D = -0.2 A			1.15	1.50	
Forward Tranconductance[A]	g_{fs}	V_{DS} = 5 V, I_D = 0.5 A	N		1.45		S
		V_{DS} = -5 V, I_D = 0.4 A	P		0.9		
Dynamic[b]							
Total Gate Charge	Q_g	N-Channel V_{DS}=5V, V_{GS}=4.5V, I_D=0.5A P-Channel V_{DS}=-5V, V_{GS}=-4.5V, I_D=-0.25A	N		1.64	2.3	nC
			P		1.1	1.5	
Gate-Source Charge	Q_{gs}		N		0.4		
			P		0.33		
Gate-Drain Charge	Q_{gd}		N		0.45		
			P		0.26		
Switching							
Turn-On Delay Time	$t_{d(on)}$	N-Chaneel V_{DD}=6V, V_{GS}=4.5V, I_D=0.5A , R_{GEN}=50Ω, P-Channel V_{DD}=-6V, V_{GS}=-4.5V, I_D=-0.41A R_{GEN}=50Ω	N		3	6	nS
			P		7	21	
Rise Time	t_r		N		8.5	18	
			P		9	19	
Turn-Off Delay Time	$t_{d(off)}$		N		17	30	
			P		55	112	
Fall-Time	t_f		N		13	25	
			P		35	71	

Notes

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

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

Typical Electrical Characteristics (N-Channel)

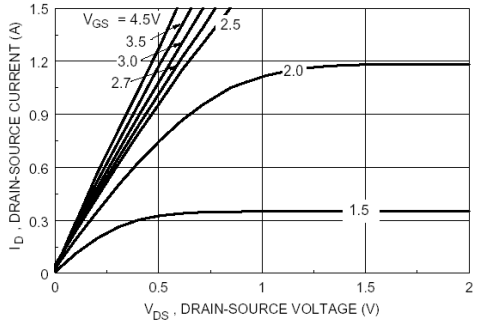


Figure 1. On-Region Characteristics.

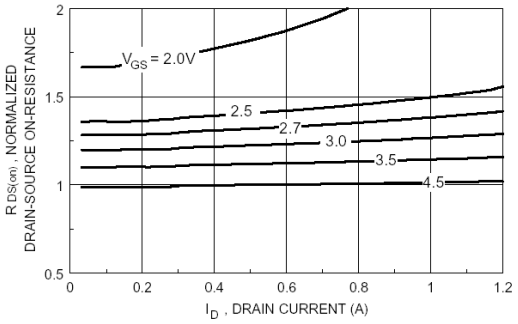


Figure 2. On-Resistance Variation with Drain Current and Gate Voltage.

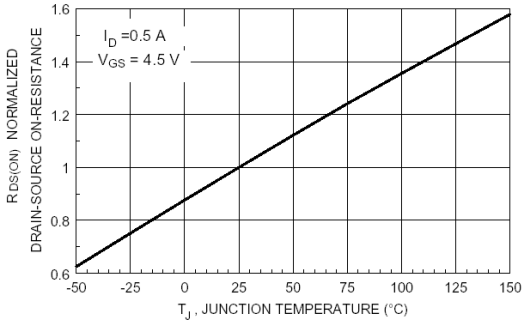


Figure 3. On-Resistance Variation with Temperature.

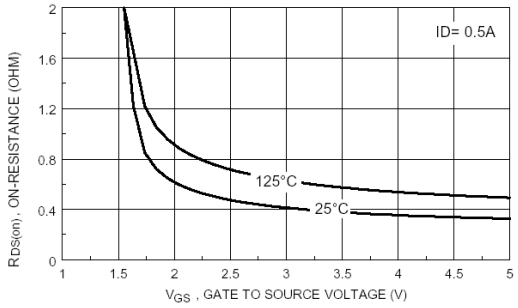


Figure 4. On Resistance Variation with Gate-To-Source Voltage.

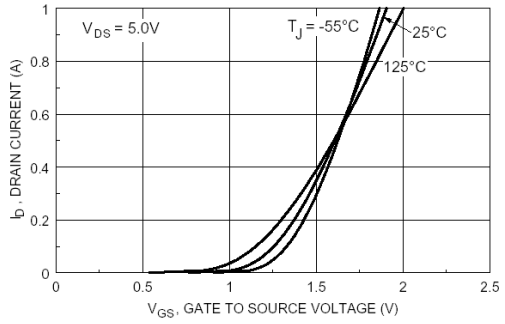


Figure 5. Transfer Characteristics.

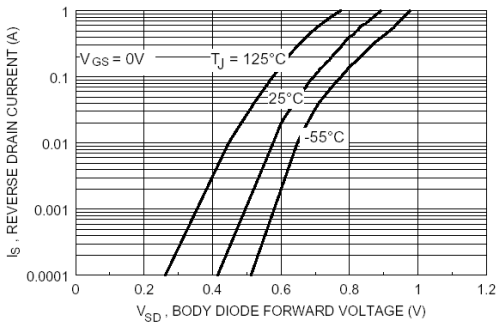


Figure 6. Body Diode Forward Voltage Variation with Source Current and Temperature.

Typical Electrical Characteristics (N-Channel)

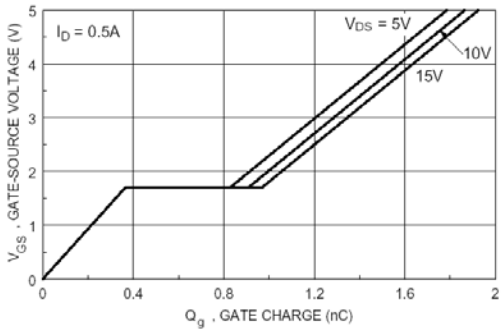


Figure 7. Gate Charge Characteristics.

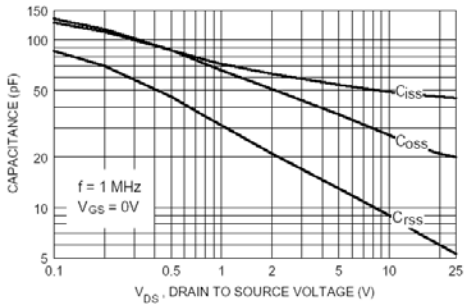


Figure 8. Capacitance Characteristics.

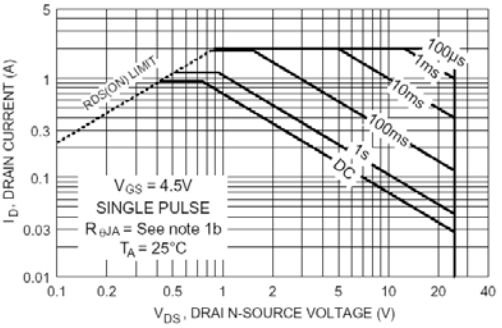


Figure 9. Maximum Safe Operating Area.

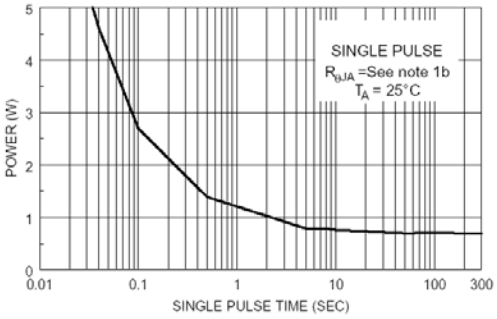


Figure 10. Single Pulse Maximum Power Dissipation.

Normalized Thermal Transient Junction to Ambient

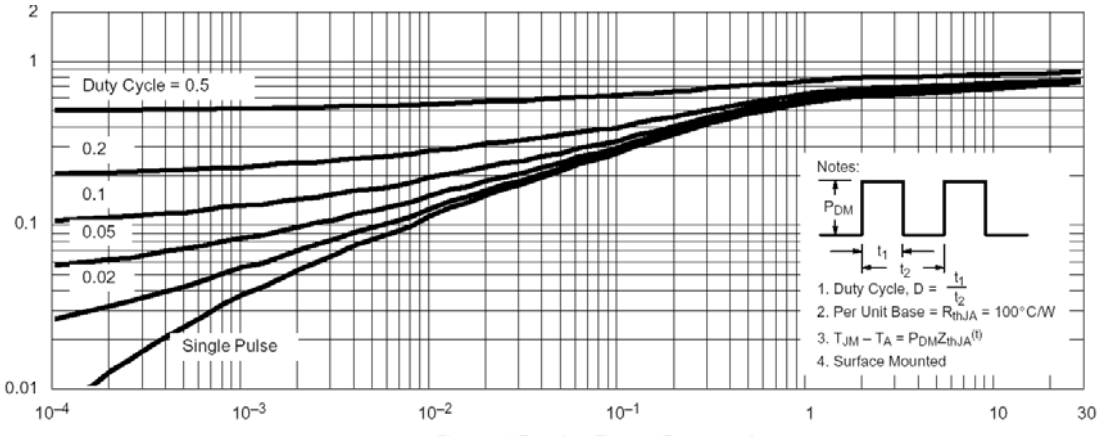


Figure 11. Transient Thermal Responce Cuve (sec)

Typical Electrical Characteristics (P-Channel)

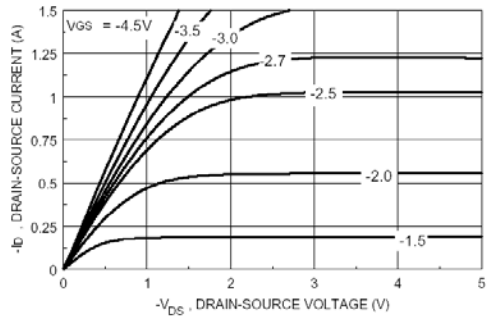


Figure 12. On-Region Characteristics.

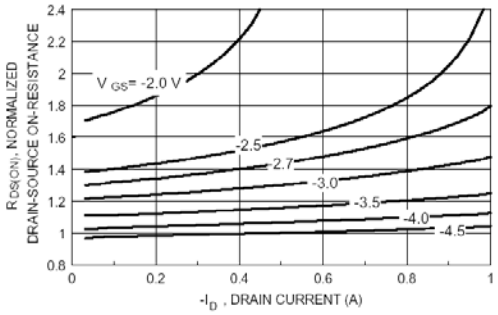


Figure 13. On-Resistance Variation with Drain Current and Gate Voltage.

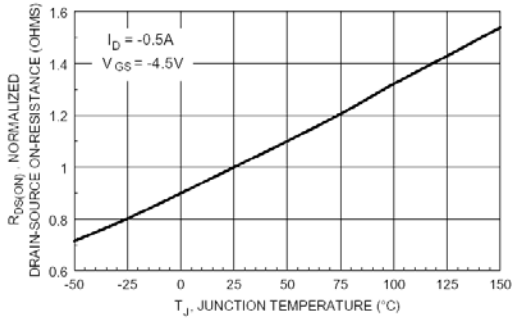


Figure 14. On-Resistance Variation with Temperature.

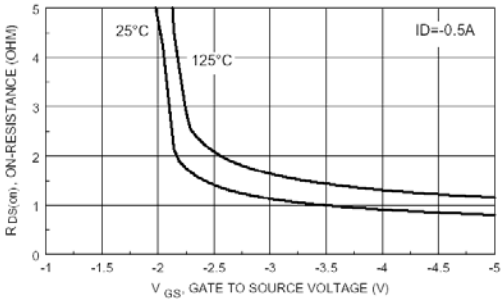


Figure 15. On Resistance Variation with Gate-To- Source Voltage.

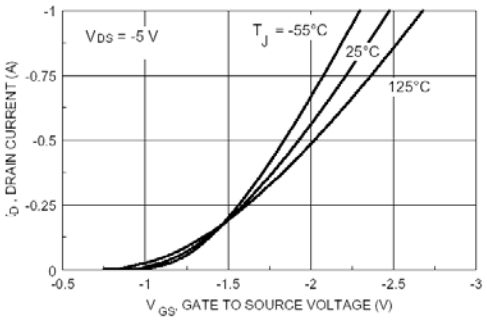


Figure 16. Transfer Characteristics.

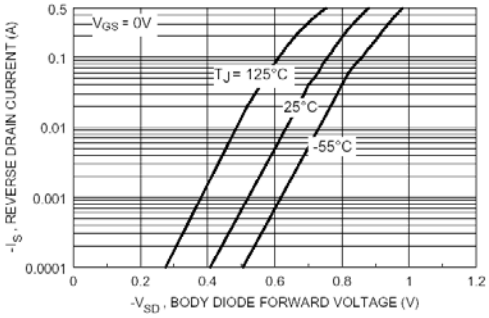


Figure 17. Body Diode Forward Voltage Variation with Source Current and Temperature.

Typical Electrical Characteristics (P-Channel)

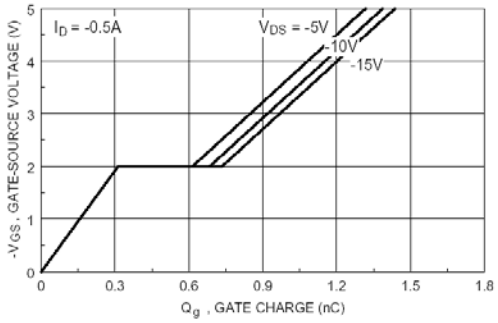


Figure 18. Gate Charge Characteristics.

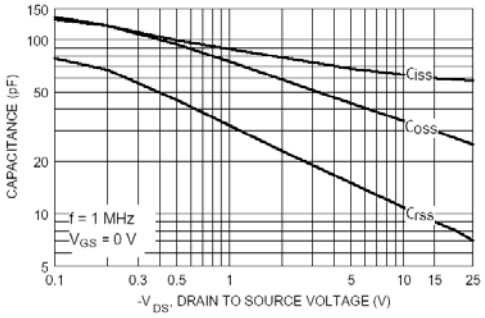


Figure 19. Capacitance Characteristics.

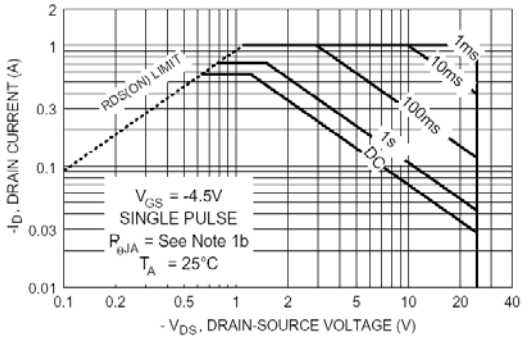


Figure 20. Maximum Safe Operating Area.

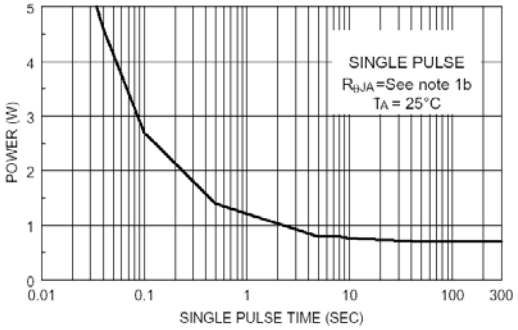


Figure 21. Single Pulse Maximum Power Dissipation.

Normalized Thermal Transient Junction to Ambient

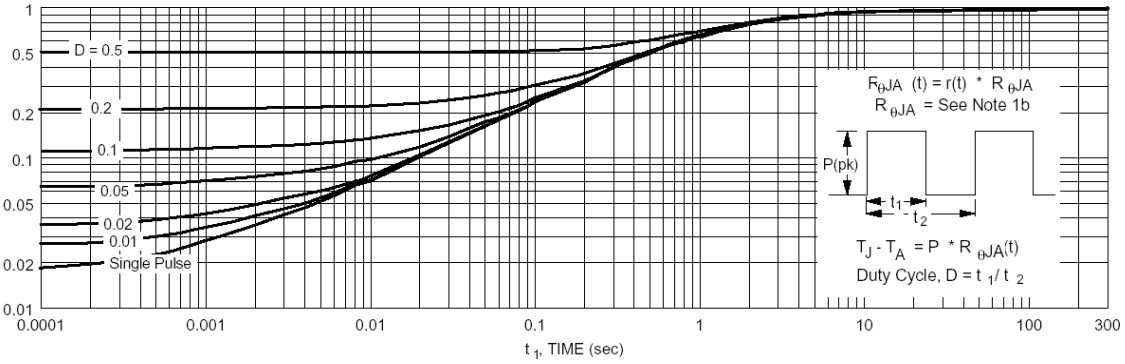
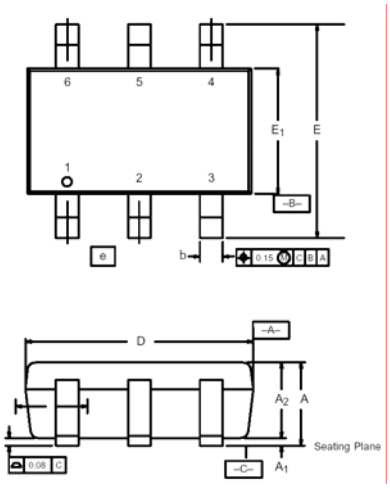
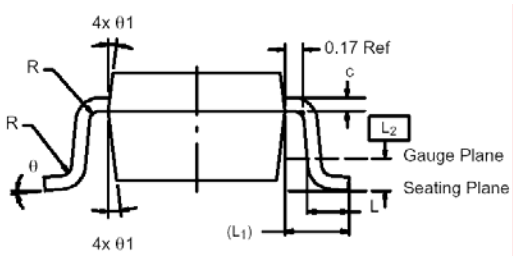


Figure 22. Transient Thermal Response Curve.

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		