

1. Description

This N-channel MOSFET has been designed specifically to improve the overall efficiency of DC/DC converters using either synchronous or conventional switching PWM controllers. It has been optimized for low gate charge, low $R_{DS(ON)}$ and fast switching speed.

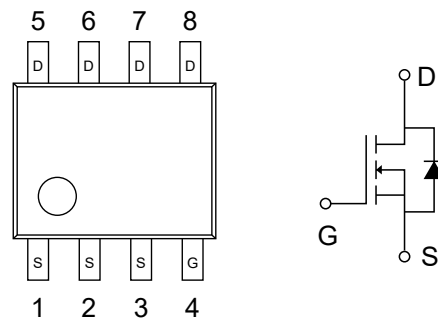
2. Features

- $V_{DS(V)}=30V$
- $I_D=7A(V_{GS}=10V)$
- $R_{DS(ON)}<23m\Omega(V_{GS}=10V)$
- $R_{DS(ON)}<30m\Omega(V_{GS}=4.5V)$
- Low gate charge

3. Pinning information

Pin	Symbol	Description
4	G	GATE
1,2,3	S	SOURCE
5,6,7,8	D	DRAIN

SOP-8



4. Absolute Maximum Ratings $T_A=25^\circ C$ unless otherwise noted

Parameter	Symbol	Rating	Units
Drain to Source Voltage	V_{DS}	30	V
Gate to Source Voltage	V_{GS}	± 20	V
Drain Current Continuous	I_D	7	A
Pulsed (Note 1a)		30	A
Single Pulse Avalanche Energy (Note 2)	E_{AS}	32	mJ
Power dissipation	P_D	1.6	W
Derate above $25^\circ C$		13	mW/ $^\circ C$
Operating and Storage Temperature	T_J, T_{STG}	-55 to 150	$^\circ C$



5. Thermal Characteristics

Parameter	Symbol	Rating	Units
Thermal Resistance, Junction-to-Ambient (Note 1a)	$R_{\theta JA}$	78	$^{\circ}C/W$
Thermal Resistance, Junction-to-Case (Note 1)	$R_{\theta JA}$	40	$^{\circ}C/W$



6. Electrical Characteristics (T_J=25°C unless otherwise noted)

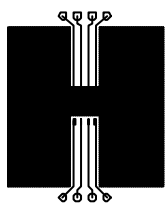
Parameter	Symbol	Conditions	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	BV _{DSS}	I _D =250μA, V _{GS} =0V	30			V
Breakdown Voltage Temperature Coefficient	$\frac{\Delta BV_{DSS}}{\Delta T_J}$	I _D =250μA Referenced to 25°C		23		mV/°C
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =24V, V _{GS} =0V			1	μA
		T _J =125°C			250	μA
Gate to Source Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V			±100	nA
Gate to Source Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1.2	1.7	2.5	V
Gate to Source Threshold Voltage Temperature Coefficient	$\frac{\Delta V_{GS(th)}}{\Delta T_J}$	I _D =250μA Referenced to 25°C		-4.3		mV/°C
Drain to Source On Resistance	R _{DS(on)}	V _{GS} =10V, I _D =7A		19	23	mΩ
		V _{GS} =4.5V, I _D =6A		24	30	mΩ
Input Capacitance	C _{iss}	V _{DS} =15V		475	635	pF
Output Capacitance	C _{oss}	V _{GS} =0V		100	135	pF
Reverse Transfer Capacitance	C _{rss}	f = 1MHz		65	100	pF
Gate Resistance	R _G	f = 1MHz		0.9	1.6	Ω
Turn-On DelayTime	t _{D(on)}	V _{DD} =15V, I _D =7A V _{GS} =10V, R _{GS} =33Ω		5	10	ns
Rise Time	t _r			9	18	ns
Turn-Off DelayTime	t _{D(off)}			42	68	ns
Fall Time	t _f			21	34	ns
Total Gate Charge	Q _g		V _{DS} =15V, I _D =7A, V _{GS} =10V		9.2	13
Total Gate Charge	Q _g	V _{DS} =15V, I _D =7A V _{GS} =5V		5	7	nC
Gate to Source Gate Charge	Q _{gs}			1.5		nC
Gate to Drain "Miller" Charge	Q _{gd}			2		nC
Source to Drain Diode Voltage	V _{SD}	I _{SD} =7A		0.9	1.25	V
		I _{SD} =2.1A		0.8	1	V



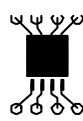
Diode Reverse Recovery Time	t_{rr}	$I_F=7A, d_{IF}/d_t=100A/\mu s$		33	nS
Diode Reverse Recovery Charge	Q_{rr}			20	nC

Notes:

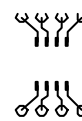
1. $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient resistance where the case thermal reference is defined as the solder mounting surface of the drain pins. $R_{\theta JC}$ is guaranteed by design while $R_{\theta CA}$ is determined by the user's board design.



a) 78°C/W when mounted on a 0.5in² pad of 2 oz copper.



b) 125° C/W when mounted on a 0.02 in² pad of oz. copper.



c) 135° C/W when mounted on a minimum pad.

Scale 1 : 1 on letter size paper

2: Starting $T_J = 25^\circ C$, $L = 1mH$, $I_{AS} = 8A$, $V_{DD} = 27V$, $V_{GS} = 10V$.

3: Pulse Test: Pulse Width <300μs, Duty Cycle <2%.



7.1 TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

<p>Figure 1: On-Region Characteristics.</p>	<p>Figure 2: On-Resistance Variation with Drain Current and Gate Voltage.</p>
<p>Figure 3: On-Resistance Variation with Temperature.</p>	<p>Figure 4: On-Resistance vs Gate to Source Voltage.</p>
<p>Figure 5: Transfer Characteristics.</p>	<p>Figure 6: Source to Drain Diode Forward Voltage vs Source Current.</p>

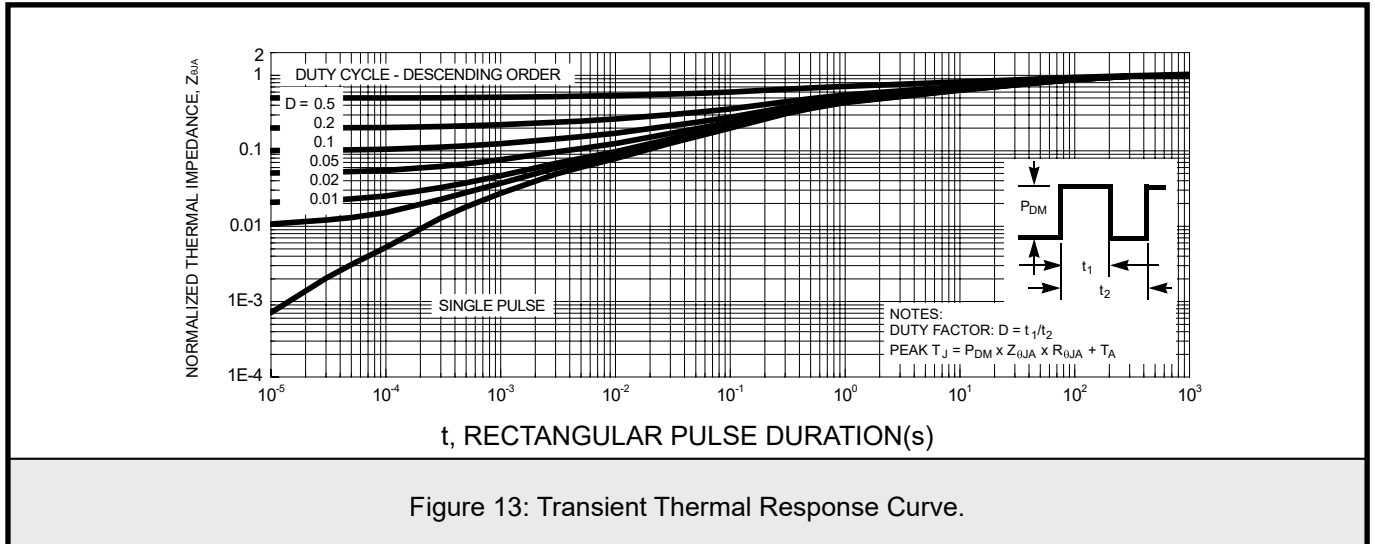


7.2 TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

<p>Figure 7: Gate-Charge Characteristics.</p>	<p>Figure 8: Capacitance vs Drain to Source Voltage.</p>
<p>Figure 9: Unclamped Inductive Switching Capability.</p>	<p>Figure 10: Maximum Continuous Drain Current vs Ambient Temperature.</p>
<p>Figure 11: Forward Bias Safe Operating Area.</p>	<p>Figure 12: Single Pulse Maximum Power Dissipation.</p>

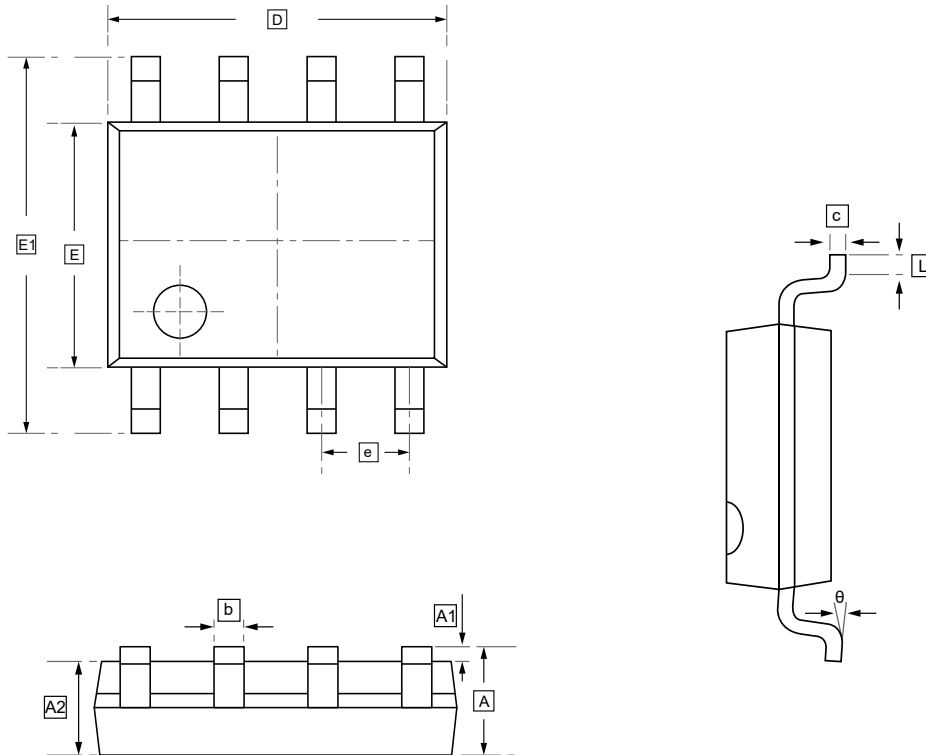


7.3 Typical Characteristics





8.SOP-8 Package Outline Dimensions

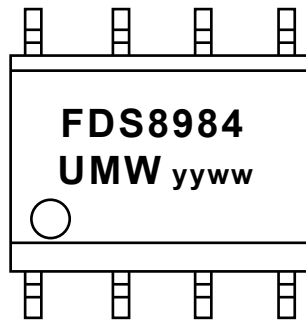


DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	b	c	D	E	E1	e	L	θ
Min	1.350	0.000	1.350	0.330	0.170	4.700	3.800	5.800	1.270	0.400	0°
Max	1.750	0.100	1.550	0.510	0.250	5.100	4.000	6.200	BSC	1.270	8°



9. Ordering information



yy: Year Code
ww: Week Code

Order Code	Package	Base QTY	Delivery Mode
UMW FDS8984	SOP-8	3000	Tape and reel



10. Disclaimer

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