

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.

2.2Features

- Fast Switching
- High performance trench technology for extremely low $R_{DS(ON)}$

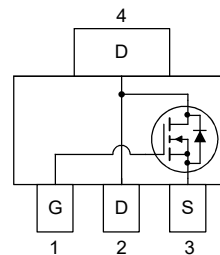
2.1Features

- $V_{DS(V)}=100V$
- $I_D=3.7A$
- $R_{DS(ON)}<120m\Omega(V_{GS}=10V)$
- $R_{DS(ON)}<130m\Omega(V_{GS}=6V)$

3.Pinning information

Pin	Symbol	Description
1	G	GATE
2,4	D	DRAIN
3	S	SOURCE

SOT-223
top view



4.Absolute Maximum Ratings $T_A=25^{\circ}C$

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DSS}	100	V
Gate-Source Voltage	V_{GSS}	± 20	V
Drain Current - Continuous (Note 1a)	I_D	3.7	A
-Pulsed		20	A
Power Dissipation for Single Operation (Note 1a)	P_D	3	W
(Note 1b)		1.3	W
(Note 1c)		1.1	W
Operating and Storage Junction Temperature Range	T_J, T_{STG}	-55 to 150	$^{\circ}C$



5. Thermal Characteristics

Parameter		Symbol	Rating	Units
Thermal Resistance, Junction-to-Ambient	(Note 1a)	$R_{\theta JA}$	42	°C/W
Thermal Resistance, Junction-to-Case	(Note 1)	$R_{\theta JC}$	12	°C/W



6. Electrical Characteristic ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Drain-Source Avalanche Energy	W_{DSS}	Single Pulse, $V_{DD}=50\text{V}$, $I_D=3.7\text{A}$			90	mJ
Drain-Source Avalanche Current	I_{AR}				3.7	A
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0\text{V}$, $I_D=250\mu\text{A}$	100			V
Breakdown Voltage Temperature Coefficient	$\frac{\Delta BV_{DSS}}{\Delta T_J}$	$I_D=250\mu\text{A}$ Referenced to 25°C		106		mV/ $^{\circ}\text{C}$
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=80\text{V}$, $V_{GS}=0\text{V}$			10	μA
Gate-Body Leakage, Forward	I_{GSSF}	$V_{GS}=20\text{V}$, $V_{DS}=0\text{V}$			100	nA
Gate-Body Leakage, Reverse	I_{GSSR}	$V_{GS}=-20\text{V}$, $V_{DS}=0\text{V}$			-100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$, $I_D=250\mu\text{A}$	2	2.5	4	V
Gate Threshold Voltage Temperature Coefficient	$\frac{\Delta V_{GS(th)}}{\Delta T_J}$	$I_D=250\mu\text{A}$ Referenced to 25°C		-6		mV/ $^{\circ}\text{C}$
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10\text{V}$, $I_D=3.7\text{A}$		88	120	m Ω
		$V_{GS}=6\text{V}$, $I_D=3.5\text{A}$		94	130	m Ω
On-State Drain Current	$I_{D(on)}$	$V_{GS}=10\text{V}$, $V_{DS}=10\text{V}$	10			A
Forward Transconductance	g_{FS}	$V_{DS}=10\text{V}$, $I_D=3.7\text{A}$		11		S
Input Capacitance	C_{iss}	$V_{DS}=50\text{V}$, $V_{GS}=0\text{V}$, $f=1\text{MHz}$		632		pF
Output Capacitance	C_{oss}			40		pF
Reverse Transfer Capacitance	C_{rss}			20		pF
Gate Resistance	$t_{D(on)}$	$V_{DD}=50\text{V}$, $I_D=1\text{A}$ $V_{GS}=10\text{V}$, $R_{GEN}=6\Omega$		8.5	17	ns
Turn-On Delay Time	t_r			2	4	ns
Turn-On Rise Time	$t_{D(off)}$			23	37	ns
Turn-Off Delay Time	t_f			4.5	9	ns
Turn-Off Fall Time	Q_g	$V_{DS}=50\text{V}$, $I_D=3.7\text{A}$, $V_{GS}=10\text{V}$		14	20	nC
Gate-Source Charge	Q_{gs}			2.4		nC
Gate-Drain Charge	Q_{gd}			3.8		nC

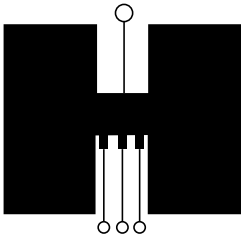


Maximum Continuous Drain–Source Diode Forward Current	I_S				2.5	A
Drain–Source Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=2.5A$ (Note 2)		0.75	1.2	V

Notes:

1. $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins.

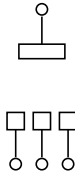
$R_{\theta JC}$ is guaranteed by design while $R_{\theta CA}$ is determined by the user's board design.



a) 42°C/W when
mounted on a 1in²
pad of 2 oz copper



b) 95°C/W when
mounted on a 0.0066
in² pad of 2 oz copper



c) 110°C/W when
mounted on a
minimum pad



7.1 Typical characteristic

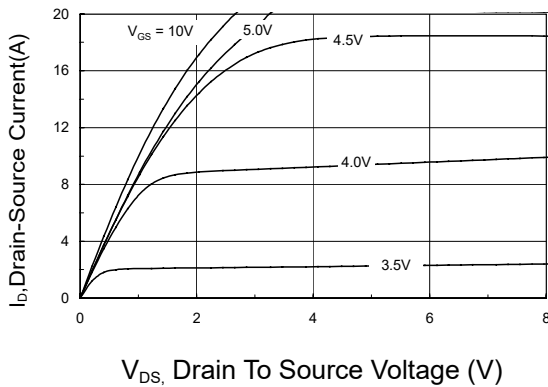


Figure 1: On-Region Characteristics

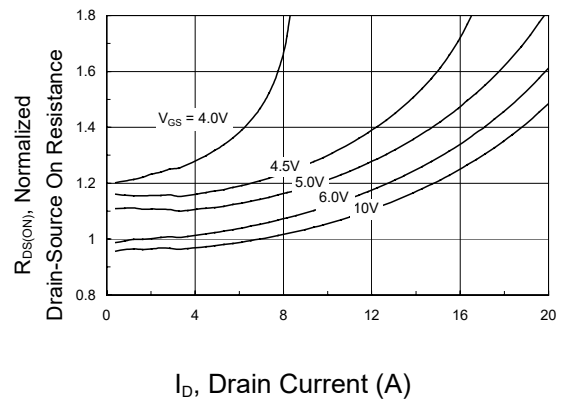


Figure 2: On-Resistance Variation with Drain Current and Gate Voltage

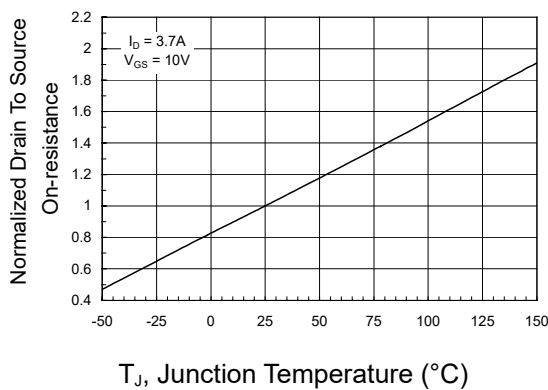


Figure 3: On-Resistance Variation with Temperature

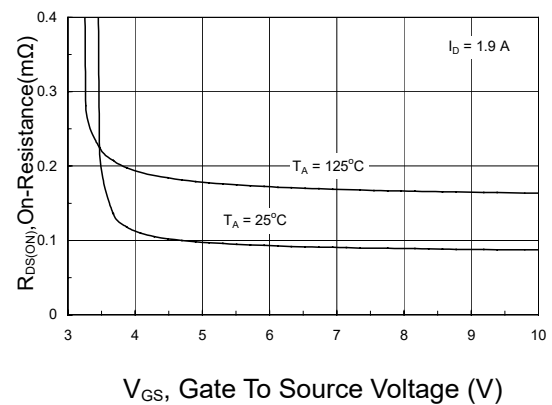


Figure 4: On-Resistance Variation with Gate-to-Source Voltage

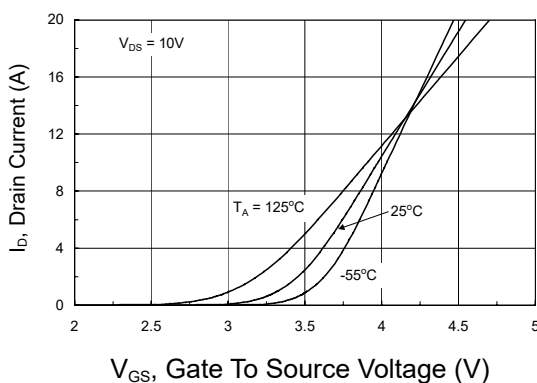


Figure 5: Transfer Characteristics

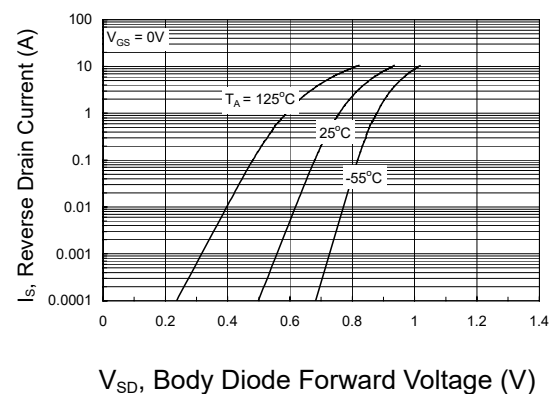


Figure 6: . Body Diode Forward Voltage Variation with Source Current and Temperature



7.2 Typical characteristic

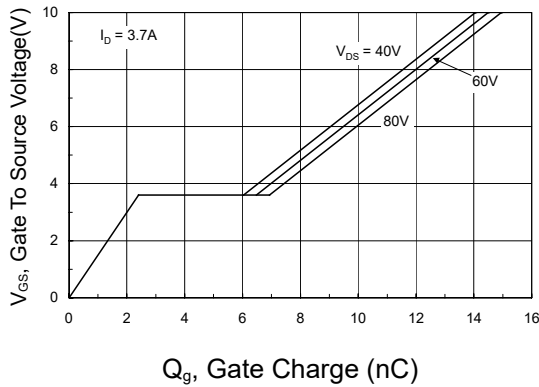


Figure 7: Gate Charge Characteristics

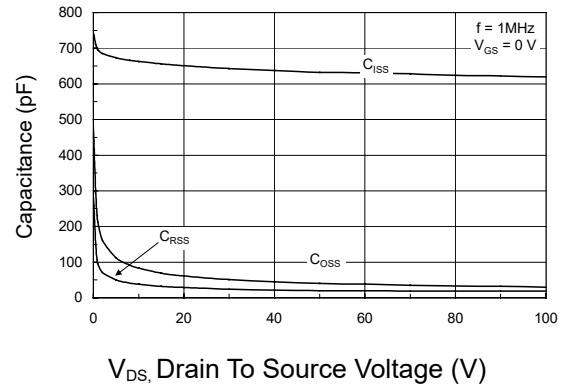


Figure 8: Capacitance Characteristics

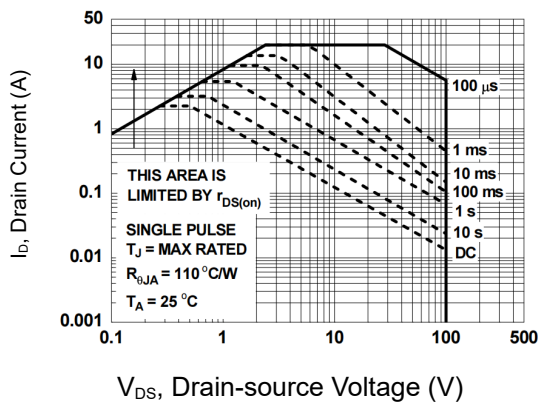


Figure 9: Maximum Safe Operating Area

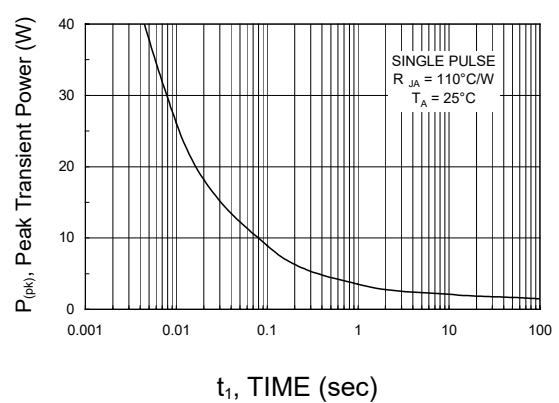


Figure 10: Single Pulse Maximum Power Dissipation

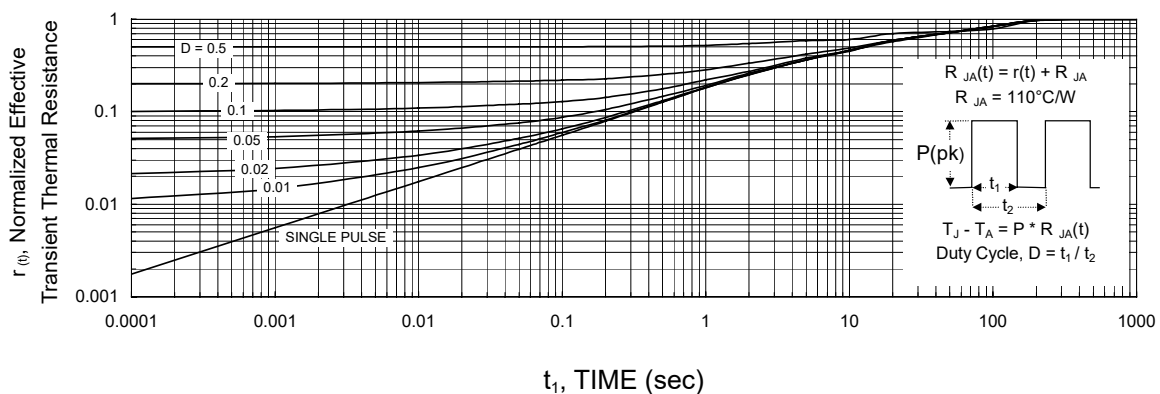
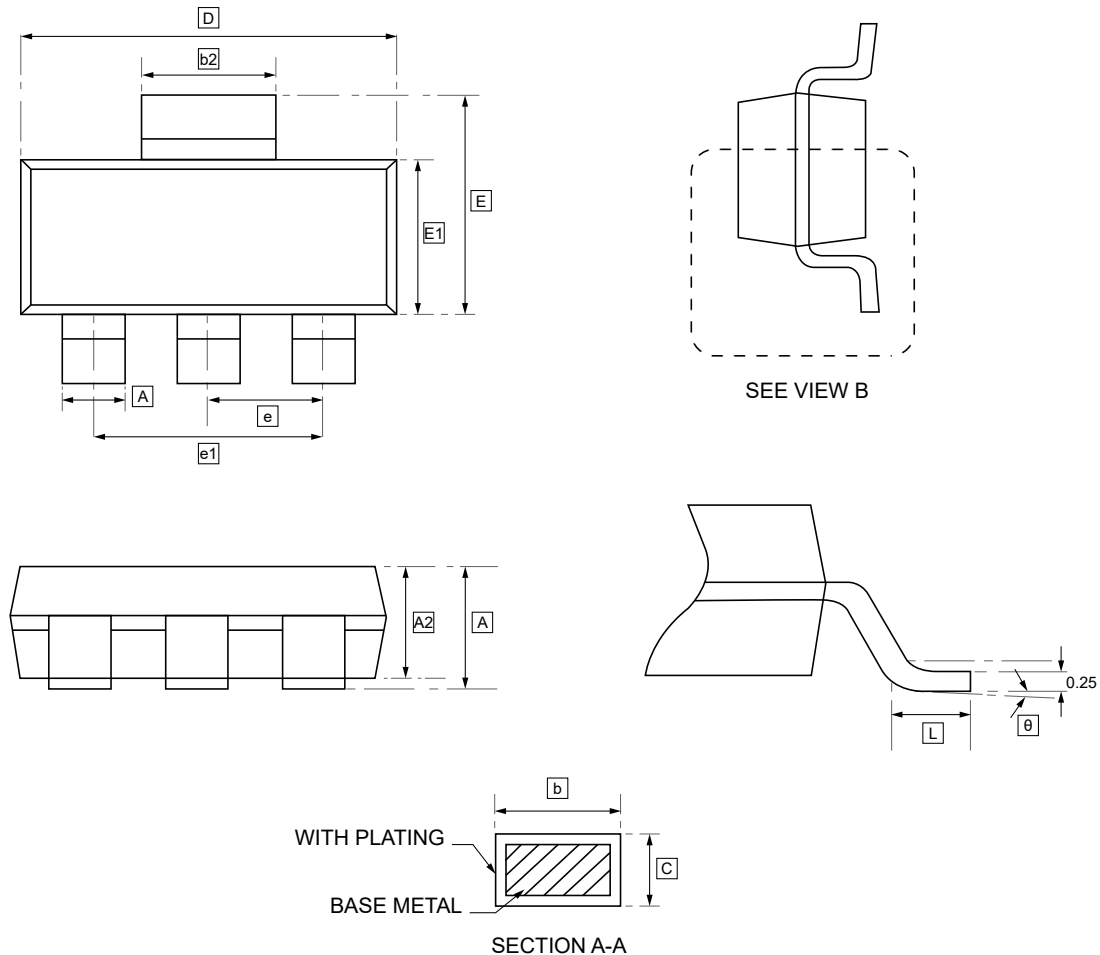


Figure 11: Transient Thermal Response Curve



8.SOT-223 Package Outline Dimensions



DIMENSIONS (mm are the original dimensions)

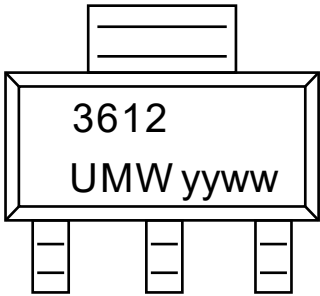
Symbol	A	A1	A2	b	b2	c	D	E	E1	e	e1	L	θ
Min		0.02	1.55	0.66	2.90	0.23	6.30	6.70	3.30	2.30	4.60	0.90	0°
Max	1.80	0.10	1.65	0.84	3.10	0.33	6.70	7.30	3.70	BSC	BSC		8°

Note.

- 1.Refer to JEDEC TO-261AA.
- 2.Dimension D and E1 are determined at the outermost extremes of the plastic body exclusive of mold flash, tie bar burrs, gateburrs, and interlead flash, but including any mismatch between the top and bottom of the plastic body.
- 3.Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.



9.Ordering information



yy: Year Code
ww: Week Code

Order Code	Package	Base QTY	Delivery Mode
UMW FDT3612	SOT-223	2500	Tape and reel



10.Disclaimer

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