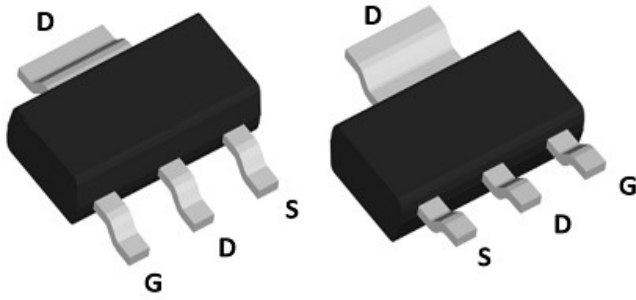
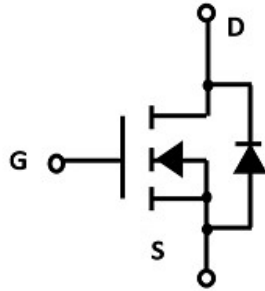


## N-Channel Enhancement Mode Field Effect Transistor



**SOT-223**



### Product Summary

- $V_{DS}$  100V
- $I_D$  4.0A
- $R_{DS(ON)}$ ( at  $V_{GS}= 10V$ ) < 110mohm
- $R_{DS(ON)}$ ( at  $V_{GS}= 4.5V$ ) < 120mohm

### General Description

- Trench Power MV MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low  $R_{DS(ON)}$

### Applications

- DC-DC Converters
- Power management functions

### ■ Absolute Maximum Ratings ( $T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-source Voltage	$V_{DS}$	100	V
Gate-source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current	$I_D$	$T_A=25^\circ\text{C}$	4
		$T_A=70^\circ\text{C}$	3.2
Pulsed Drain Current <sup>A</sup>	$I_{DM}$	16	A
Total Power Dissipation @ $T_A=25^\circ\text{C}$	$P_D$	2.5	W
Thermal Resistance Junction-to-Ambient <sup>B</sup>	$R_{\theta JA}$	50	$^\circ\text{C}/\text{W}$
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	16	$^\circ\text{C}/\text{W}$
Junction and Storage Temperature Range	$T_J, T_{STG}$	-55~+150	$^\circ\text{C}$

### ■ Ordering Information (Example)

PREFERRED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
YJM04N10A	F2	1004	2500	/	40000	7" reel



# YJM04N10A

## ■ Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
<b>Static Parameter</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA	100			V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =100V, V <sub>GS</sub> =0V			1	μA
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20V, V <sub>DS</sub> =0V			±100	nA
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> =250μA	1.1	1.8	3.0	V
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> =4A		95	110	mΩ
		V <sub>GS</sub> = 4.5V, I <sub>D</sub> =3.2A		100	120	
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =4A, V <sub>GS</sub> =0V		0.8	1.2	V
Maximum Body-Diode Continuous Current	I <sub>S</sub>				4	A
<b>Dynamic Parameters</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =50V, V <sub>GS</sub> =0V, f=1MHZ		1070		pF
Output Capacitance	C <sub>oss</sub>			33		
Reverse Transfer Capacitance	C <sub>rss</sub>			30		
<b>Switching Parameters</b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>GS</sub> =10V, V <sub>DS</sub> =50V, I <sub>D</sub> =10A		26		nC
Gate-Source Charge	Q <sub>gs</sub>			5.4		
Gate-Drain Charge	Q <sub>gd</sub>			5.8		
Reverse Recovery Charge	Q <sub>rr</sub>	I <sub>F</sub> =10A, di/dt=100A/us		30.1		
Reverse Recovery Time	t <sub>rr</sub>			40		
Turn-on Delay Time	t <sub>D(on)</sub>	V <sub>GS</sub> =10V, V <sub>DD</sub> =50V, R <sub>L</sub> =6.4Ω R <sub>GEN</sub> =3Ω		7		ns
Turn-on Rise Time	t <sub>r</sub>			24		
Turn-off Delay Time	t <sub>D(off)</sub>			24		
Turn-off fall Time	t <sub>f</sub>			31		

A. Pulse Test: Pulse Width ≤ 300us, Duty cycle ≤ 2%.

B. R<sub>θJA</sub> is the sum of the junction-to-lead and lead-to-ambient thermal resistance, where the lead thermal reference is defined as the solder mounting surface of the drain pins. R<sub>θJL</sub> is guaranteed by design, while R<sub>θJA</sub> is determined by the board design. The maximum rating presented here is based on mounting on a 1 in 2 pad of 2oz copper.



## ■ Typical Performance Characteristics

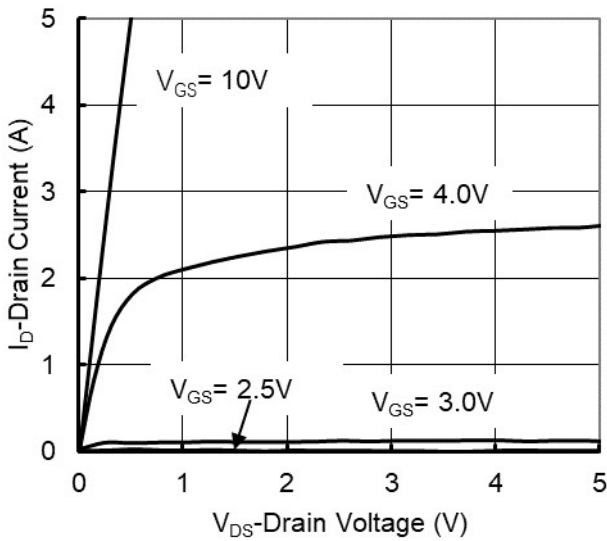


Figure 1. Output Characteristics

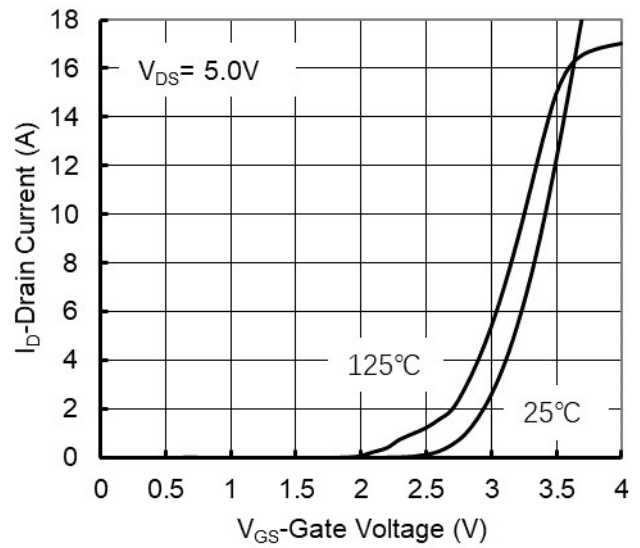


Figure 2. Transfer Characteristics

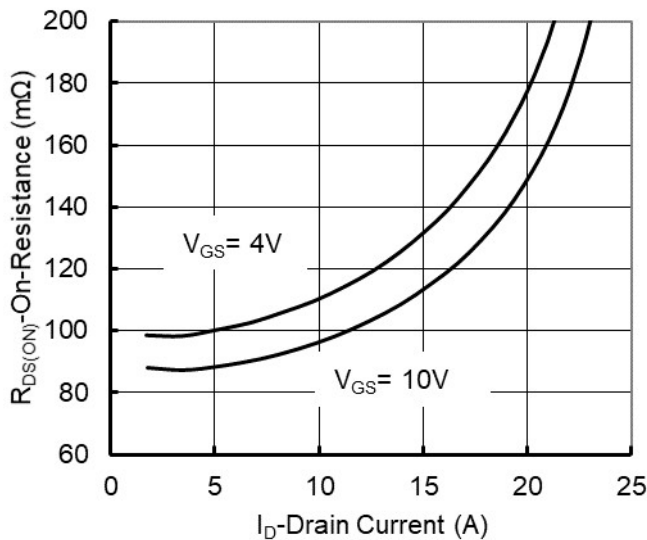


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

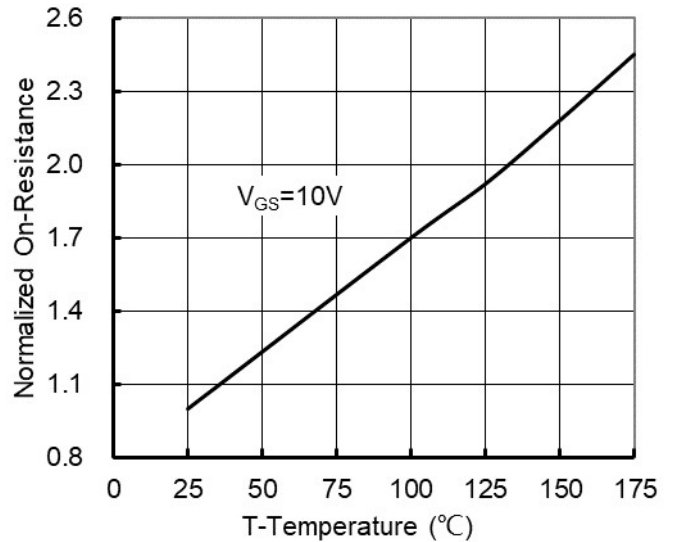


Figure 4. On-Resistance vs. Junction Temperature

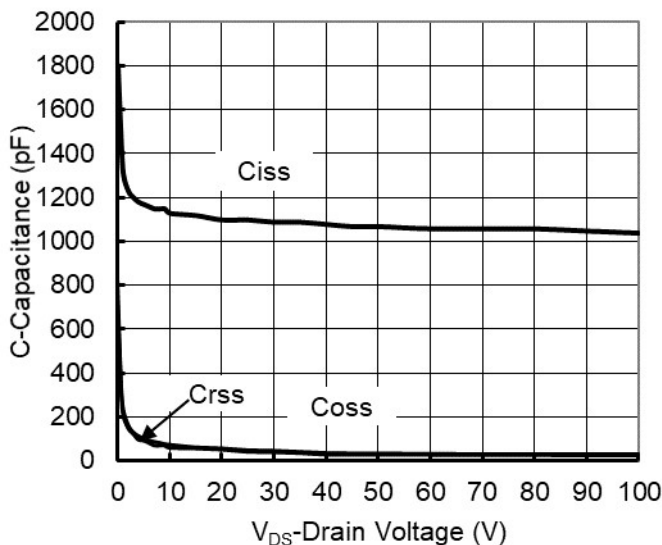


Figure 5. Capacitance Characteristics

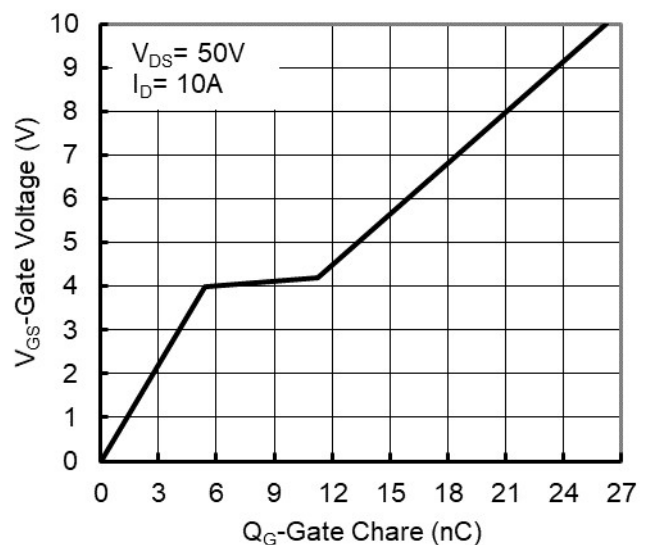


Figure 6. Gate Charge



# YJM04N10A

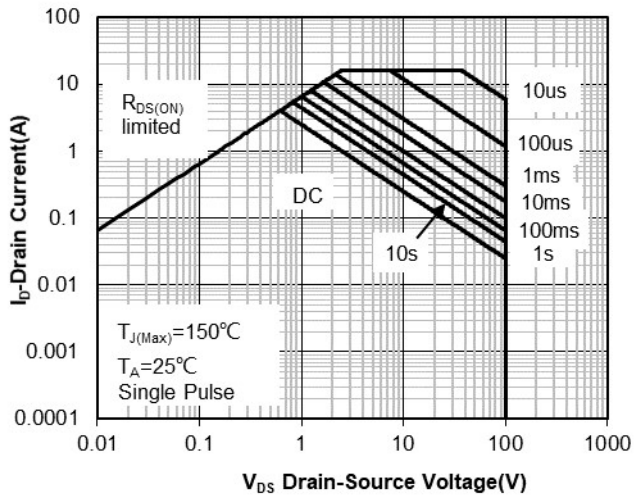


Figure 7. Safe Operation Area

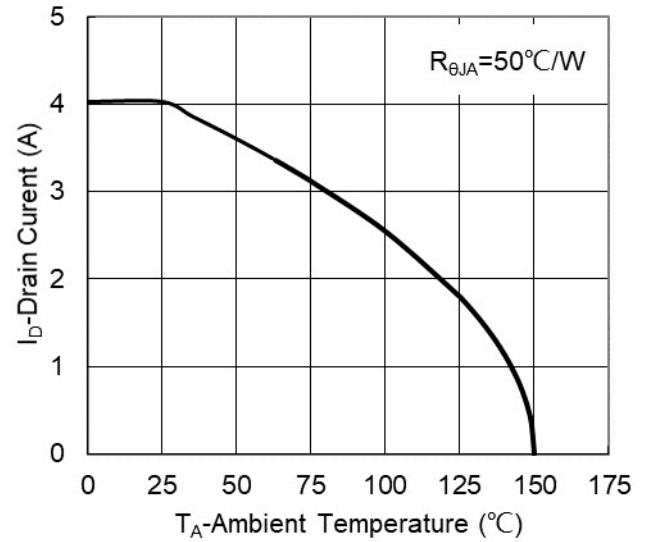


Figure 8. Maximum Continuous Drain Current vs Ambient Temperature

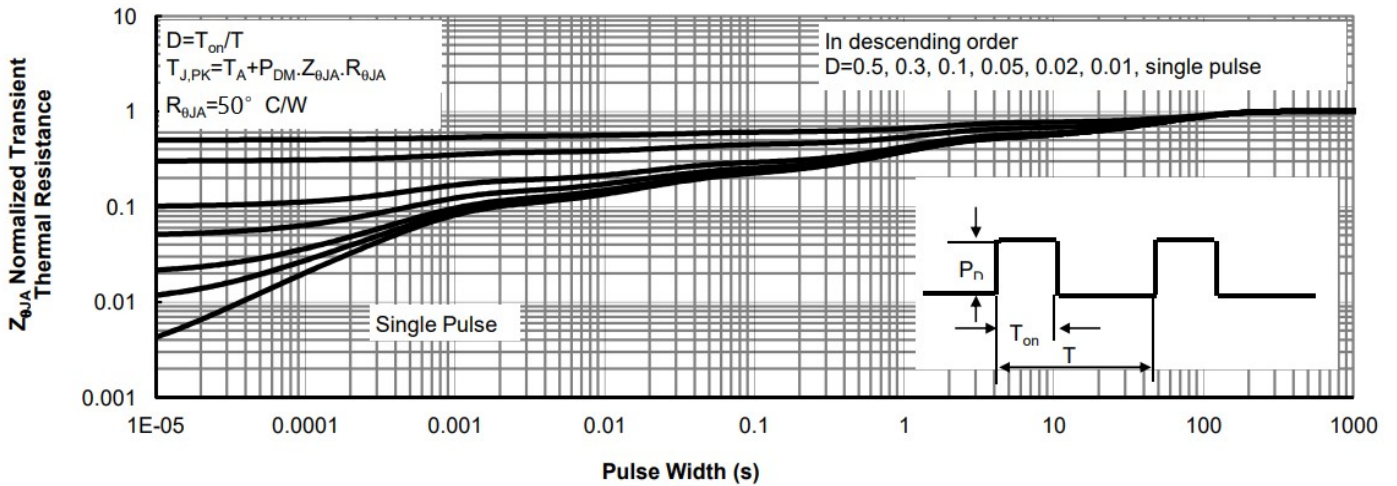
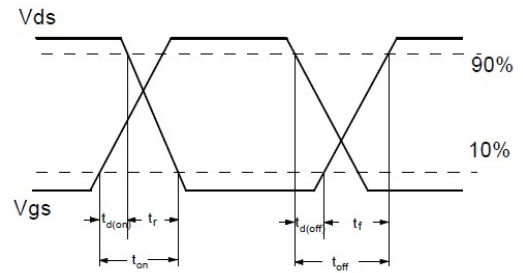
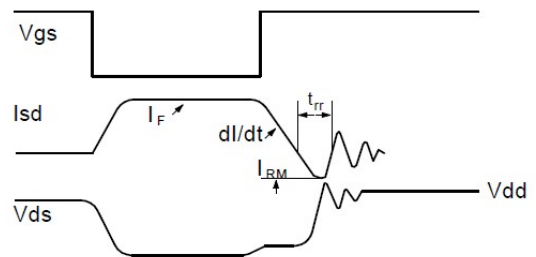
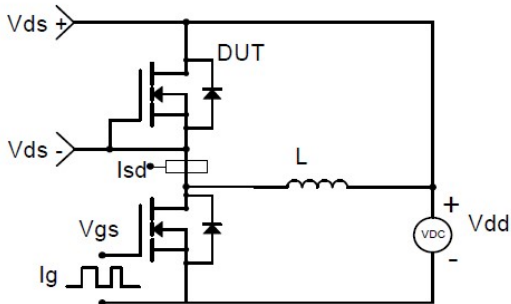


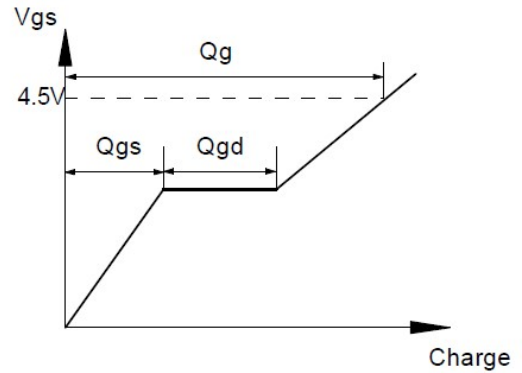
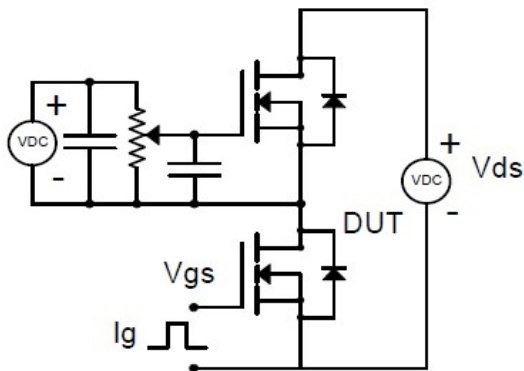
Figure 9. Normalized Maximum Transient Thermal Impedance



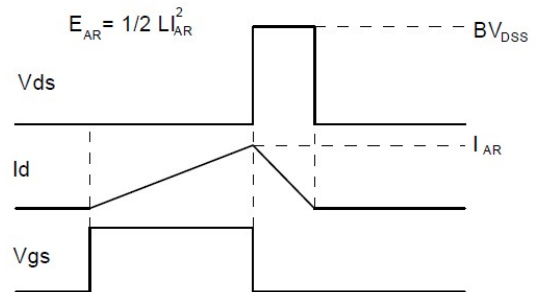
**Resistive Switching Test Circuit & Waveforms**



**Diode Recovery Test Circuit & Waveforms**



**Gate Charge Test Circuit & Waveform**

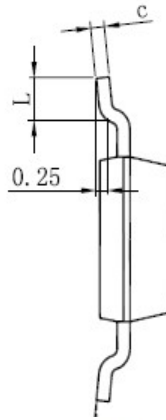
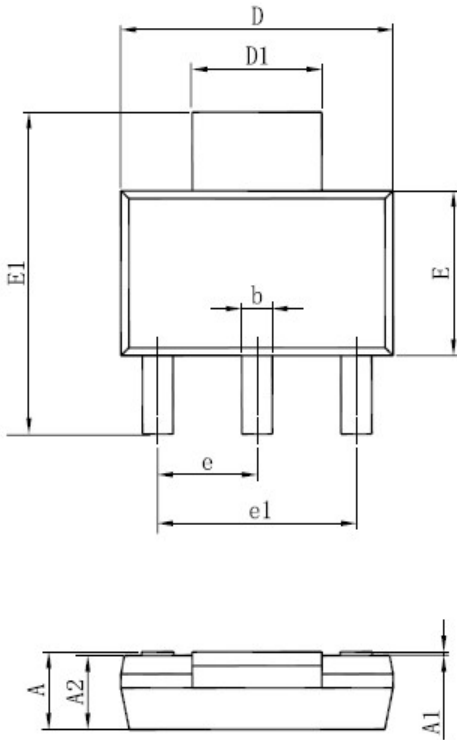


**Unclamped Inductive Switching (UIS) Test Circuit & Waveforms**



# YJM04N10A

## ■ SOT-223 Package information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.520	1.800	0.060	0.071
A1	0.000	0.100	0.000	0.004
A2	1.500	1.700	0.059	0.067
b	0.660	0.820	0.026	0.032
c	0.250	0.350	0.010	0.014
D	6.200	6.400	0.244	0.252
D1	2.900	3.100	0.114	0.122
E	3.300	3.700	0.130	0.146
E1	6.830	7.070	0.269	0.278
e	2.300(BSC)		0.091(BSC)	
e1	4.500	4.700	0.177	0.185
L	0.900	1.150	0.035	0.045
θ	0°	10°	0°	10°



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