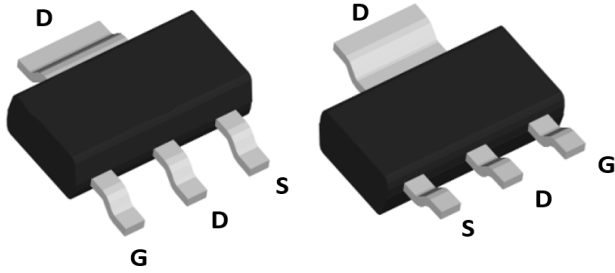
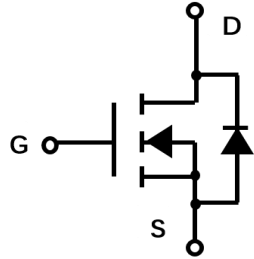


N-Channel Enhancement Mode Power MOSFET



SOT-223



Product Summary

- V_{DS} 100V
- I_D 4A
- $R_{DS(ON)}$ (at $V_{GS}=10V$) < 110 mohm
- $R_{DS(ON)}$ (at $V_{GS}=4.5V$) < 120 mohm

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}	± 20	V
Drain Current	$T_A=25^\circ\text{C}$	I_D	4.0	A
	$T_A=70^\circ\text{C}$		3.2	
Pulsed Drain Current ^A		I_{DM}	16	A
Total Power Dissipation @ $T_A=25^\circ\text{C}$		P_D	2.5	W
Thermal Resistance Junction-to-Ambient ^B		$R_{\theta JA}$	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
LM04N10A	F2	1004	2500	5000	40000	13" reel

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

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D =250μA	100			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =100V, V _{GS} =0V			1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} = ±20V, V _{DS} =0V			±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D =250μA	1.1	1.8	3.0	V
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} = 10V, I _D =4A		95	110	mΩ
		V _{GS} = 4.5V, I _D =3.2A		100	120	
Diode Forward Voltage	V _{SD}	I _S =4A, V _{GS} =0V		0.8	1.2	V
Maximum Body-Diode Continuous Current	I _S				4	A
Dynamic Parameters						
Input Capacitance	C _{iss}	V _{DS} =50V, V _{GS} =0V, f=1MHZ		800		pF
Output Capacitance	C _{oss}			40		
Reverse Transfer Capacitance	C _{rss}			32		
Switching Parameters						
Total Gate Charge	Q _g	V _{GS} =10V, V _{DS} =50V, I _D =4A		16		nC
Gate-Source Charge	Q _{gs}			2.5		
Gate-Drain Charge	Q _{gd}			2.6		
Turn-on Delay Time	t _{D(on)}	V _{GS} =10V, V _{DD} =50V, R _L =6.4Ω R _{GEN} =3Ω		6		ns
Turn-on Rise Time	t _r			41		
Turn-off Delay Time	t _{D(off)}			25		
Turn-off fall Time	t _f			8		

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

B. R_{θJA} 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_{θJC} is guaranteed by design, while R_{θJA} 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

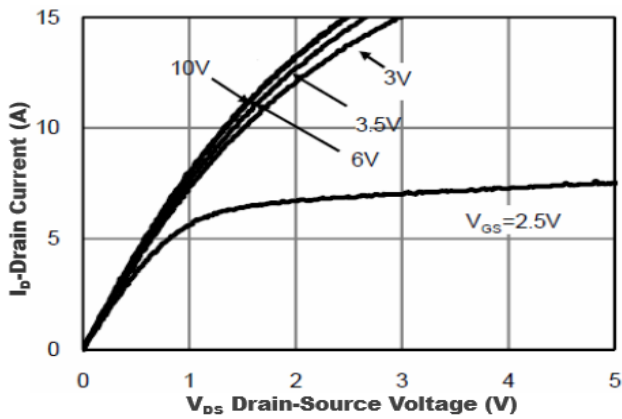


Figure1. Output Characteristics

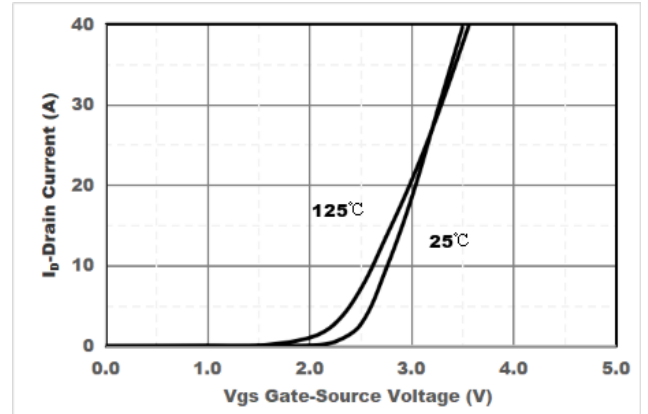


Figure2. Transfer Characteristics

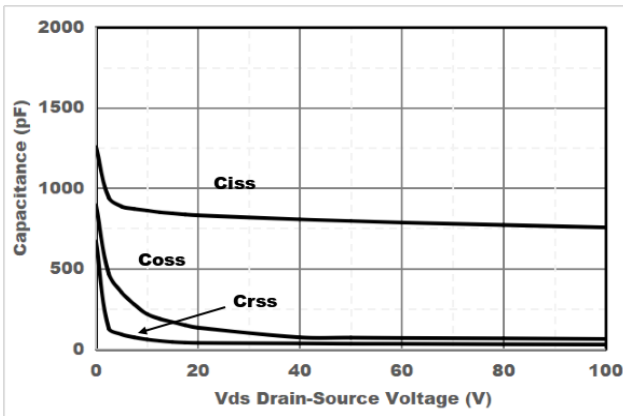


Figure3. Capacitance Characteristics

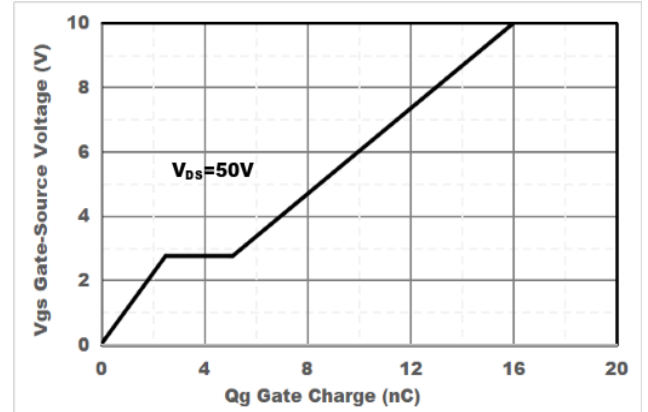


Figure4. Gate Charge

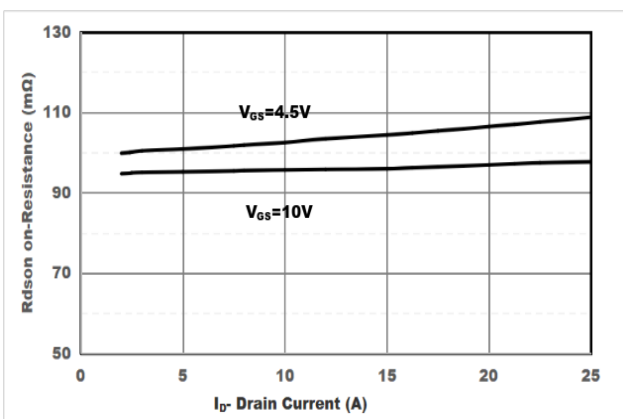


Figure5. Drain-Source on Resistance

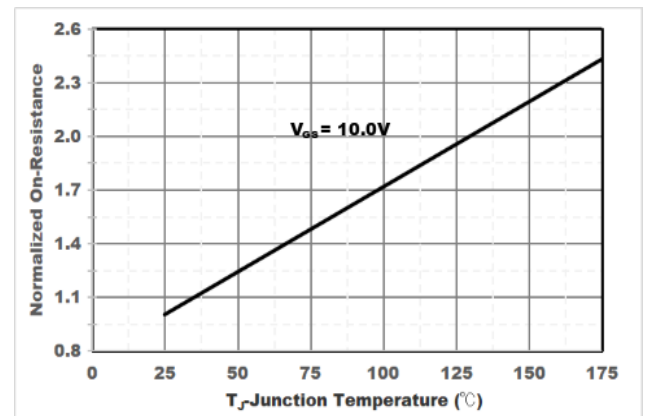


Figure6. Drain-Source on Resistance

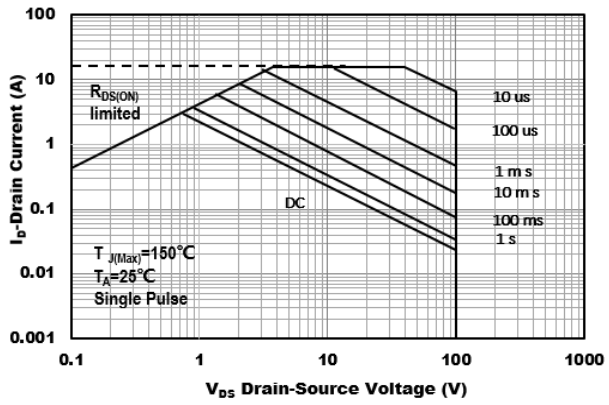


Figure7. Safe Operation Area

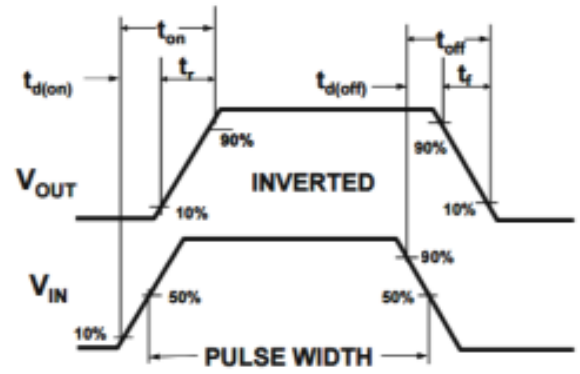
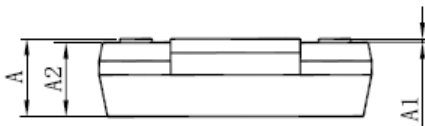
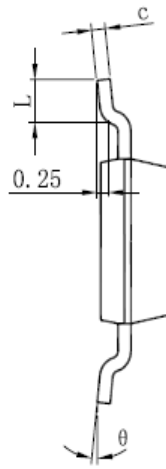
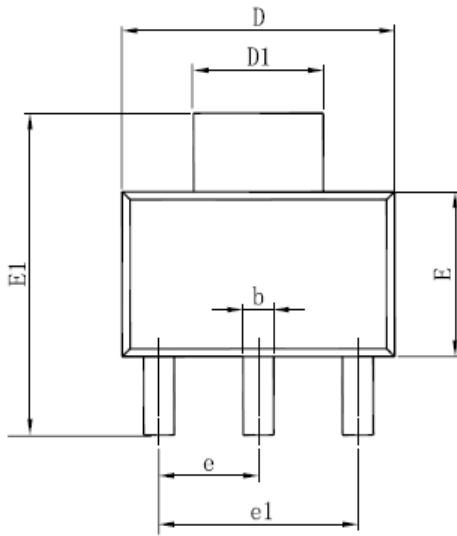


Figure8. Switching wave

■ 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°