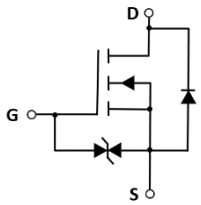
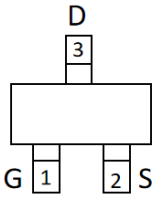
1. General Description

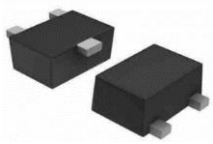
The MN20V018A uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with low gate voltages. This device is suitable for use as a load switch or in Power switch applications. The mosfet with ESD protected as 2000V.



Schematic Diagram



Pin assignment



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2. Specification Features

- V_{DS} =20V, I_D =1.0 A
- $R_{DS(ON)}$ <180mΩ @ V_{GS} =4.5 V (TYPE: 140mΩ)
- $R_{DS(ON)}$ <210mΩ @ V_{GS} =2.5 V (TYPE: 170mΩ)
- High Power and current handing capability
- Lead free product is acquired
- Surface Mount Package

3. Application

- PWM applications
- Load switch
- Power management

4. Absolute Maximum Ratings (T_J =25℃)

Characteristics		Symbol	Rating	Unit
Drain-Source Voltage		V_{DSS}	20	V
Gate-Source Voltage		V_{GSS}	±8	V
Continuous Drain Current (1)	Tc=25℃(silicon limited)	I_D	1.0	A
	Tc=25℃(package limited)		0.95	
	Tc=100℃(silicon limited)		0.72	
Pulsed Drain Current (2)		I_{DM}	6	
Power Dissipation	Tc=25℃	P_D	430	mW
	Tc=100℃		280	
Single Pulse Avalanche Energy (3)		EAS		mJ
Junction and Storage Temperature Range		T_J, Tstg	-55~150	℃

5. Thermal Characteristics

Characteristics	Symbol	Rating	Unit
Thermal Resistance,Junction-to-Ambient(1)	RθJA	446	℃/W
Thermal Resistance,JunctiontoCase	RθJC	290	

6. Electrical Characteristics (TJ =25℃)

Symbol	Characteristics	Test Conditions	Min	Typ	Max	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	I_D=250μA, V_{GS}=0V	20	22		V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	0.45	0.65	1	V
I_{DSS}	Drain CutOff Current	V_{DS}=20V, V_{GS}=0V			1	μA
I_{GSS}	Gate Leakage Current	V_{GS}=±8V, V_{DS}=0V			±5	μA
$R_{DS(on)}$	Drain-Source On-Resistance	V_{GS}=4.5V, I_D=0.6A		140	180	mΩ
		V_{GS}=2.5V, I_D=0.5A		170	210	
g_{FS}	Forward Transconductance	V_{DS}=5V, I_D=1.5A		1		S
Dynamic Characteristics						
Qg	Total Gate Charge	V_{DS}=4.5V, I_D=0.5A, V_{GS}=10V		1.4		nc
Qgs	Gate Source Charge			0.18		
Qgd	Gate Drain Charge			0.28		
Ciss	Input Capacitance	V_{DS}=10V, V_{GS}=0V, f=100KHz		64		pF
Crss	Reverse Transfer Capacitance			11		
Coss	Output Capacitance			15		
$t_{D(on)}$	Turn-On Delay Time	V_{GS}=4.5V, V_{DS}=10V, R_L=5Ω, R_G=6Ω		24		ns
tr	Rise Time			86		
$t_{D(off)}$	Turn-Off Delay Time			750		
tf	Fall Time			420		
Rg	Gate Resistance	f=100KHz		9.32		KΩ
Drain-Source Body Diode Characteristics						
V_{SD}	SourceDrain Diode Forward Voltage	I_S=0.5A, V_{GS}=0V		-	1.5	V
trr	Body Diode Reverse Recovery Time	I_F=0.5A, dI/dt=100A/μS		-		ns
Qrr	Body Diode Reverse Recovery Charge			-		nc

Notes 1.Repetitive Rating: Pulse width limited by maximum junction temperature.

7. Typical Electrical and Thermal Characteristics （Curves）

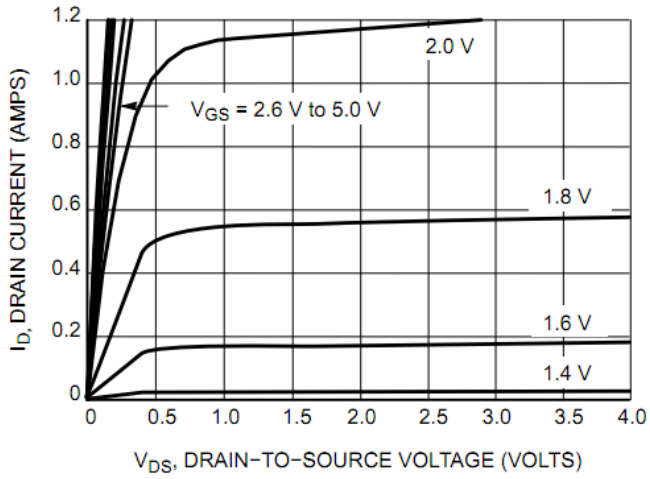


Figure 1. On−Region Characteristics

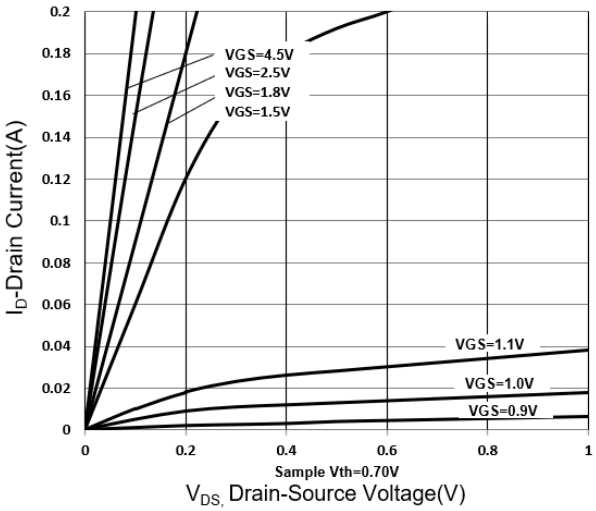


Figure 2.Output Characteristics

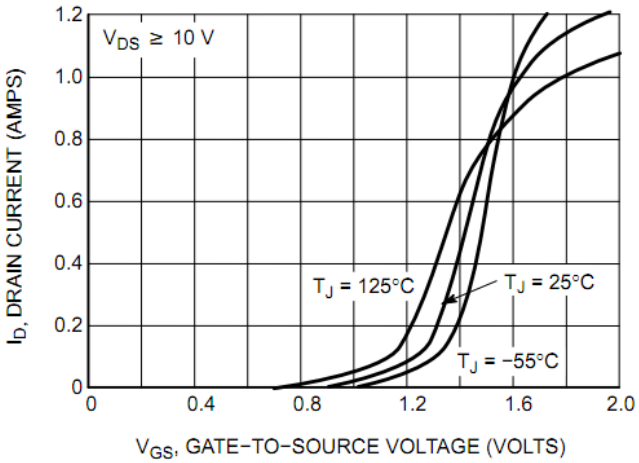


Figure 3. Transfer Characteristics

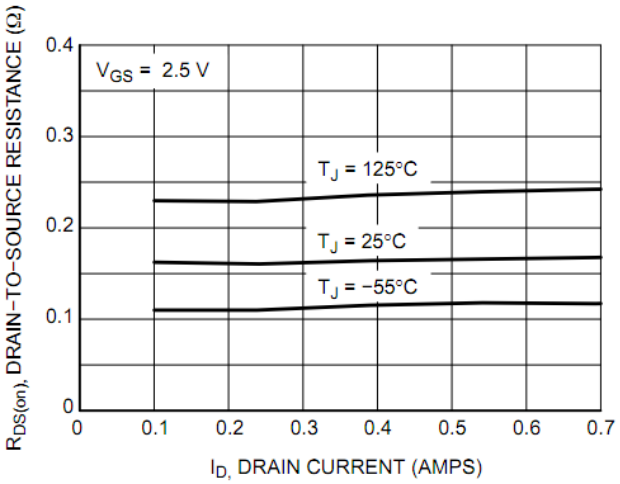


Figure 4. On−Resistance vs. Drain Current and Temperature

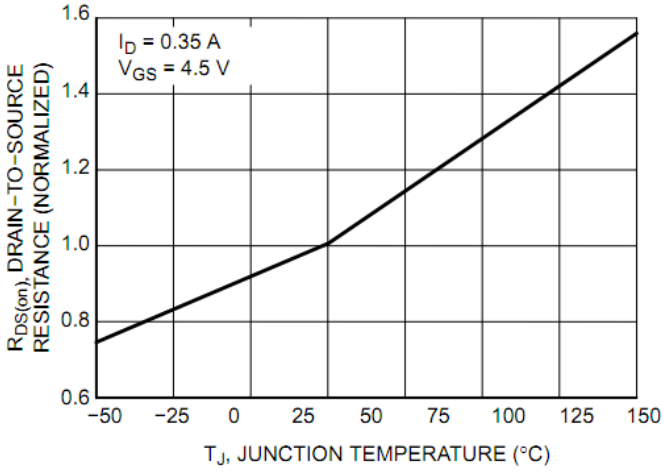


Figure 5. On−Resistance Variation with Temperature

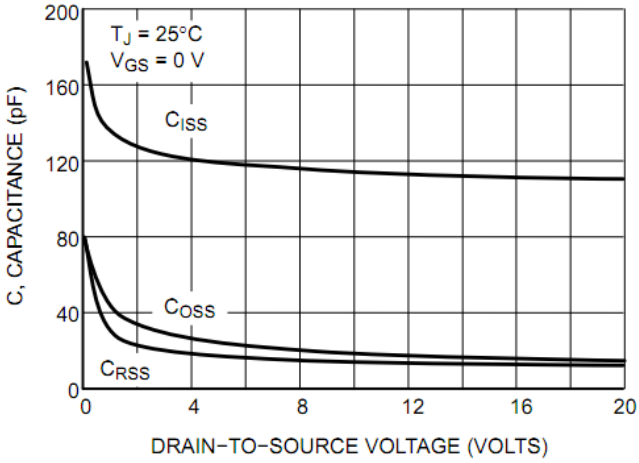


Figure 6. Capacitance Variation

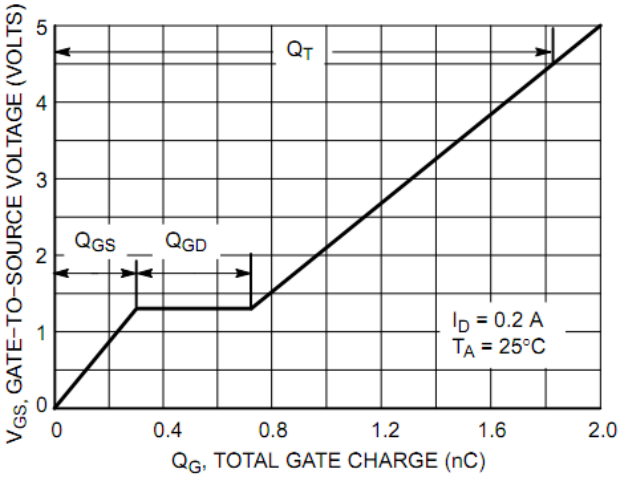


Figure 7. Gate−to−Source Voltage vs. Total Gate Charge

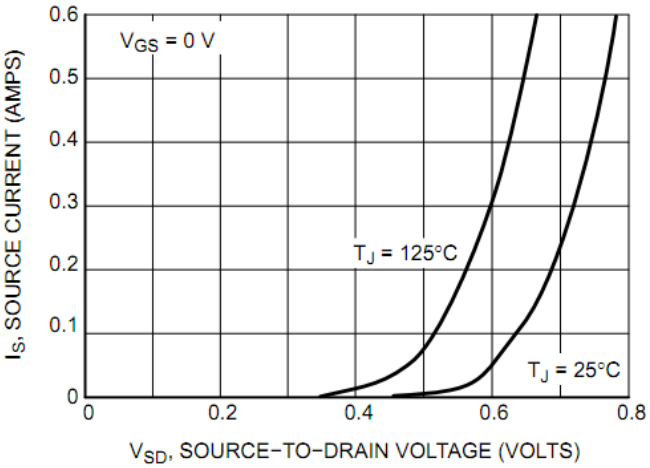


Figure 8. Diode Forward Voltage vs. Current

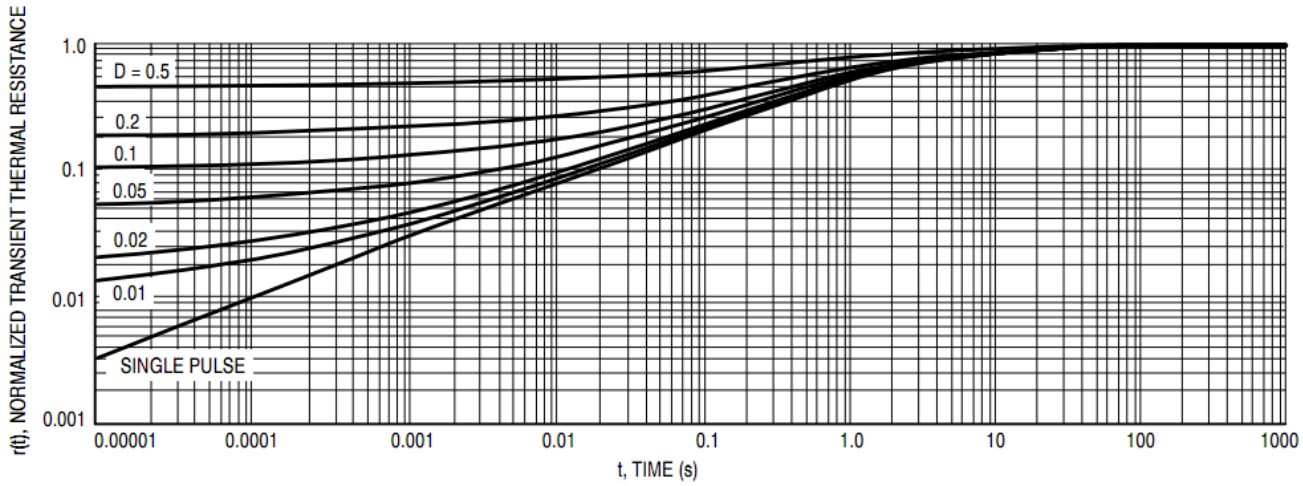
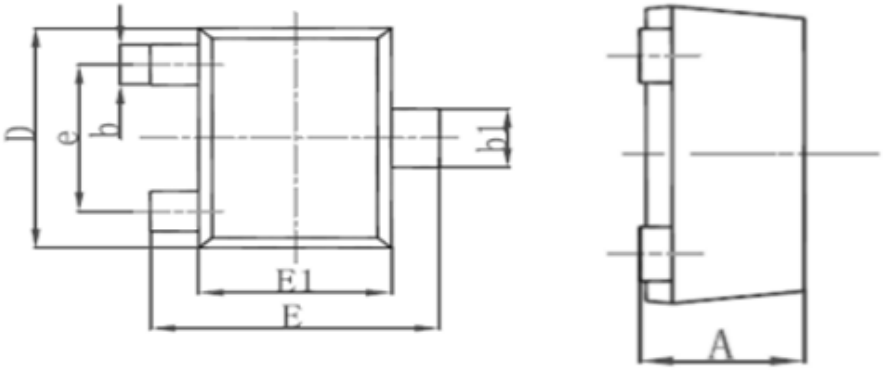
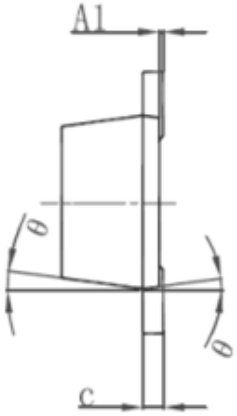


Figure 9. Normalized Thermal Response

8. Package Outline Dimensions

Device Marking	Device	Package	Reel size	Tape width	Quantity
2H	MN20V018A	SOT-723	7inch	8mm	10K





DD UNIT:mm		
	Min	Max
	0.36	0.50
	0.00	0.05
	0.17	0.27
	0.27	0.37
	0.08	0.15
	1.15	1.25
	1.15	1.25
E1	0.75	0.85
e	0.8typ	
ɵ	7ºREF	

9. RICTIONS ON PRODUCT USE

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Revision History		
Date	Version	Updated Content
2025/3/26	V1.2	Ciss、Crss、Coss、Rg