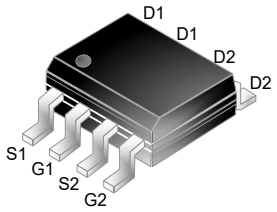
WMS08DH04T1

40V N+P Dual Channel Enhancement Mode Power MOSFET

Description

WMS08DH04T1 uses advanced power trench technology that has been especially tailored to minimize the on-state resistance and yet maintain superior switching performance.

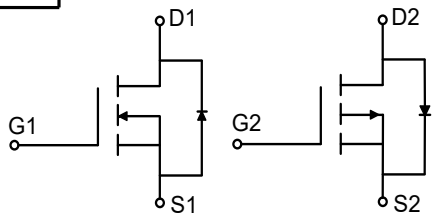


SOP-8L

Features

- N - Channel:
  V_{DS}= 40V, I_D = 7.5A
  $R_{DS(on)}$ < 24mΩ @ V_{GS} = 10V
  $R_{DS(on)}$ < 31mΩ @ V_{GS} = 4.5V
- P - Channel:
  V_{DS}= -40V, I_D = -5.5A
  $R_{DS(on)}$ < 47mΩ @ V_{GS} = -10V
  $R_{DS(on)}$ < 60mΩ @ V_{GS} = -4.5V
- Low Gate Charge
- 100% EAS Guaranteed

RoHS compliant



Applications

- Synchronous Rectification
- DC/DC Converter
- High-Frequency Switching

Absolute Maximum Ratings (T_A = 25°C, unless otherwise noted)

Parameter		Symbol	Value		Unit
Drain-Source Voltage		V_{DS}	40	-40	V
Gate-Source Voltage		V_{GS}	±20	±20	V
Continuous Drain Current	T_A=25°C	I_D	7.5	-5.5	A
	T_A=100°C		4.7	3.5	
Pulsed Drain Current[1]		I_{DM}	30	-22	A
Single Pulse Avalanche Energy[2]		EAS	26.45	26.45	mJ
Total Power Dissipation	T_A=25°C	P_D	2.2		W
Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150		°C

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance from Junction-to-Ambient[3]	$R_{\theta JA}$	56.8	°C/W

Electrical Characteristics: N-Channel (T_J=25°C unless otherwise noted)

Parameter		Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics							
Drain-Source Breakdown Voltage		$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	40	-	-	V
Gate-Body Leakage current		I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V	-	-	±100	nA
Zero Gate Voltage Drain Current	T_J=25°C	I_{DSS}	V_{DS} = 40V, V_{GS} = 0V	-	-	1	μA
	T_J=100°C			-	-	100	
Gate-Threshold Voltage		$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	1.0	1.5	2.5	V
Drain-Source on-Resistance[4]		$R_{DS(on)}$	V_{GS} = 10V, I_D = 6A	-	18	24	mΩ
			V_{GS} = 4.5V, I_D = 4A	-	24	31	
Forward Transconductance[4]		g_{fs}	V_{DS} = 10V, I_D = 6A	-	15.8	-	S
Dynamic Characteristics[5]							
Input Capacitance		C_{iss}	V_{DS} = 20V, V_{GS} =0V, f =1MHz	-	1155	-	pF
Output Capacitance		C_{oss}		-	90	-	
Reverse Transfer Capacitance		C_{rss}		-	75	-	
Gate Resistance		R_g	f =1MHz	-	3.7	-	Ω
Switching Characteristics[5]							
Total Gate Charge		Q_g	V_{GS} = 10V, V_{DS} = 20V, I_D= 6A	-	26	-	nC
Gate-Source Charge		Q_{gs}		-	2.8	-	
Gate-Drain Charge		Q_{gd}		-	4.5	-	
Turn-on Delay Time		$t_{d(on)}$	V_{GS} =10V, V_{DD} = 20V, R_G = 3Ω, I_D= 6A	-	6.5	-	ns
Rise Time		t_r		-	16	-	
Turn-off Delay Time		$t_{d(off)}$		-	26.8	-	
Fall Time		t_f		-	14.5	-	
Drain-Source Body Diode Characteristics							
Diode Forward Voltage[4]		V_{SD}	I_S = 6A, V_{GS} = 0V	-	-	1.2	V
Continuous Source Current	T_A=25°C	I_S	-	-	-	7.5	A

Notes:

1. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150°C.
2. The EAS data shows Max. rating . The test condition is V_{DD}= 25V, V_{GS}= 10V,L=0.1mH, I_{AS}= 23A.
3. The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper, The value in any given application depends on the user's specific board design.
4. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
5. This value is guaranteed by design hence it is not included in the production test.

Electrical Characteristics: P-Channel (T_J=25°C unless otherwise noted)

Parameter		Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics							
Drain-Source Breakdown Voltage		$V_{(BR)DSS}$	V_{GS} = 0V, I_D = -250μA	-40	-	-	V
Gate-Body Leakage current		I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V	-	-	±100	nA
Zero Gate Voltage Drain Current	T_J=25°C	I_{DSS}	V_{DS} = -40V, V_{GS} = 0V	-	-	-1	μA
	T_J=100°C			-	-	-100	
Gate-Threshold Voltage		$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = -250μA	-1.0	-1.6	-2.5	V
Drain-Source on-Resistance[4]		$R_{DS(on)}$	V_{GS} = -10V, I_D = -5A	-	37	47	mΩ
			V_{GS} = -4.5V, I_D = -3A	-	47	60	
Forward Transconductance[4]		g_{fs}	V_{DS} = -10V, I_D = -5A	-	15.8	-	S
Dynamic Characteristics[5]							
Input Capacitance		C_{iss}	V_{DS} = -20V, V_{GS} =0V, f =1MHz	-	1045	-	pF
Output Capacitance		C_{oss}		-	85	-	
Reverse Transfer Capacitance		C_{rss}		-	78	-	
Gate Resistance		R_g	f =1MHz	-	10.8	-	Ω
Switching Characteristics[5]							
Total Gate Charge		Q_g	V_{GS} = -10V, V_{DS} = -20V, I_D= -5A	-	20	-	nC
Gate-Source Charge		Q_{gs}		-	4.2	-	
Gate-Drain Charge		Q_{gd}		-	3	-	
Turn-on Delay Time		$t_{d(on)}$	V_{GS} = -10V, V_{DD} = -20V, R_G = 3Ω, I_D= -5A	-	20	-	ns
Rise Time		t_r		-	15	-	
Turn-off Delay Time		$t_{d(off)}$		-	52	-	
Fall Time		t_f		-	11	-	
Drain-Source Body Diode Characteristics							
Diode Forward Voltage[4]		V_{SD}	I_S = -5A, V_{GS} = 0V	-	-	-1.2	V
Continuous Source Current	T_A=25°C	I_S	-	-	-	-5.5	A

Notes:

1. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150°C.
2. The EAS data shows Max. rating . The test condition is V_{DD}= -25V, V_{GS}= -10V,L=0.1mH, I_{AS}= -23A
3. The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper, The value in any given application depends on the user's specific board design.
4. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
5. This value is guaranteed by design hence it is not included in the production test..

Typical Characteristics:N-Channel

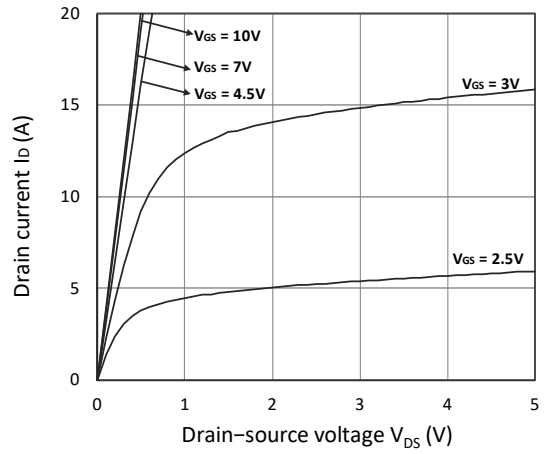


Figure 1. Output Characteristics

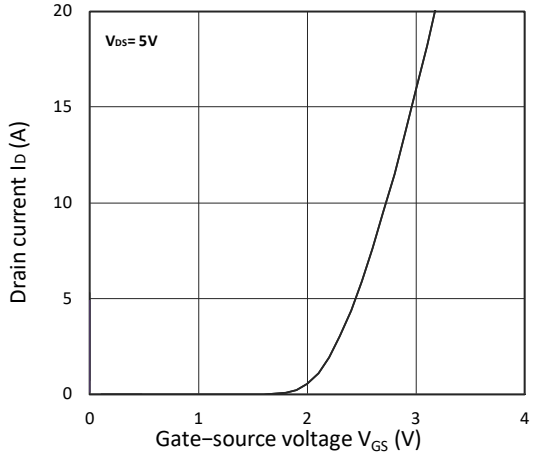


Figure 2. Transfer Characteristics

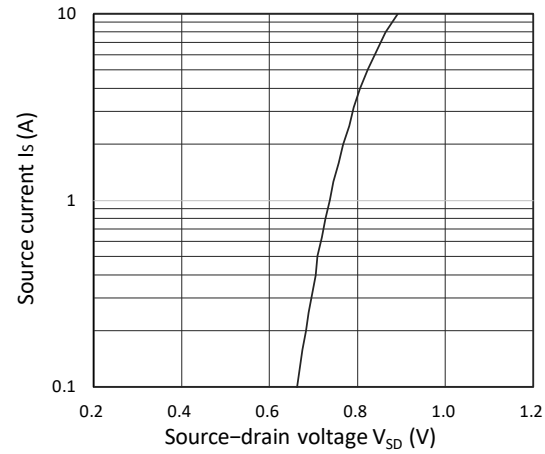


Figure 3. Forward Characteristics of Reverse

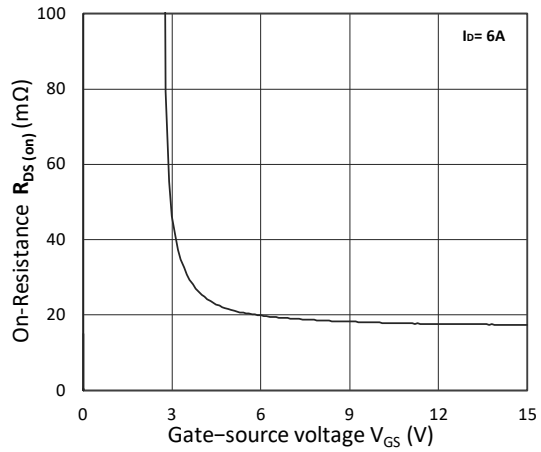


Figure 4. $R_{DS(ON)}$ vs. V_{GS}

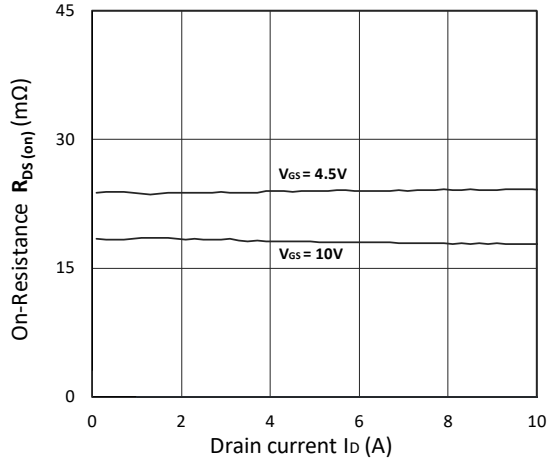


Figure 5. $R_{DS(ON)}$ vs. I_D

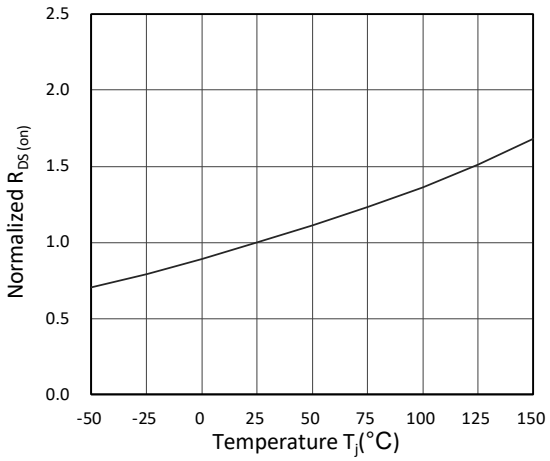


Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

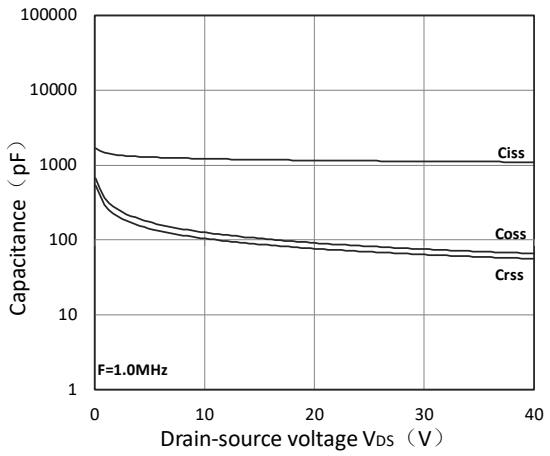


Figure 7. Capacitance Characteristics

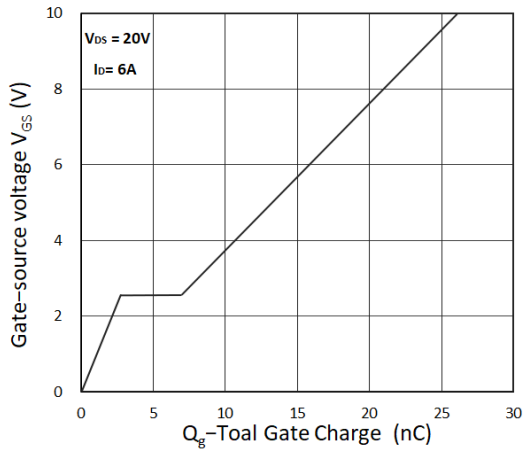


Figure 8. Gate Charge Characteristics

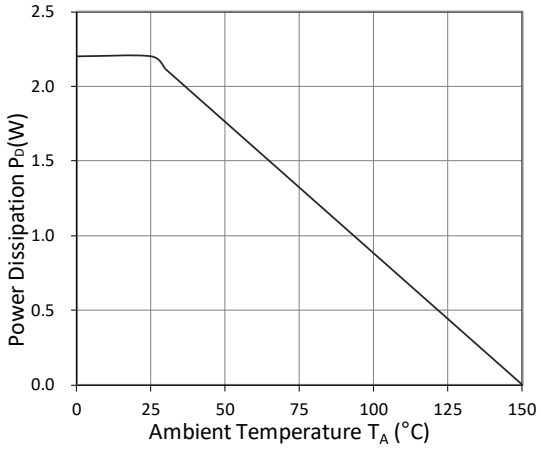


Figure 9. Power Dissipation

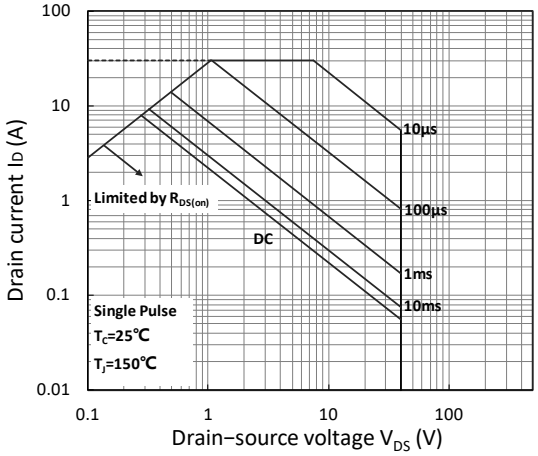


Figure10. Safe Operating Area

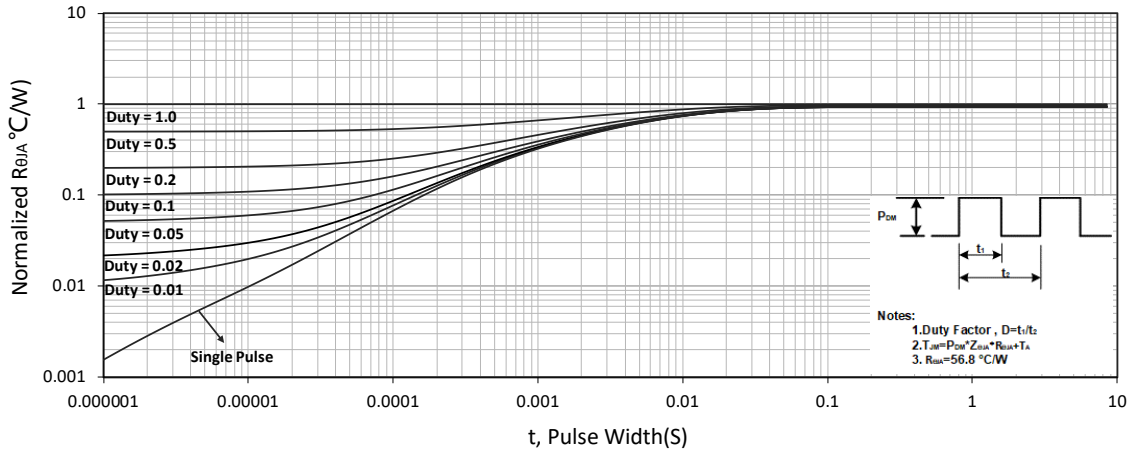


Figure 11. Normalized Maximum Transient Thermal Impedance

Typical Characteristics:P-Channel

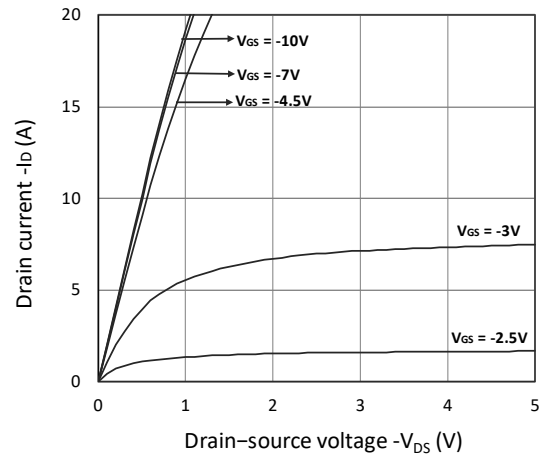


Figure 1. Output Characteristics

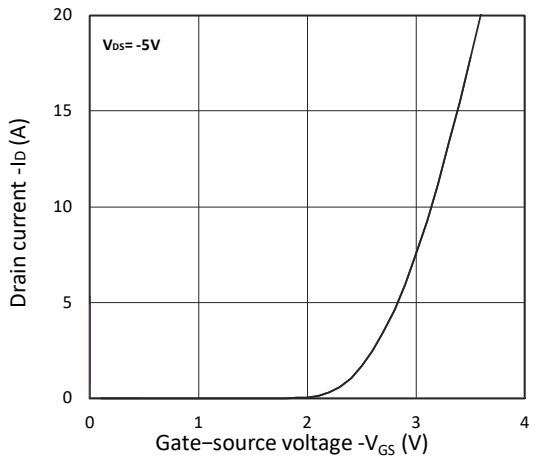


Figure 2. Transfer Characteristics

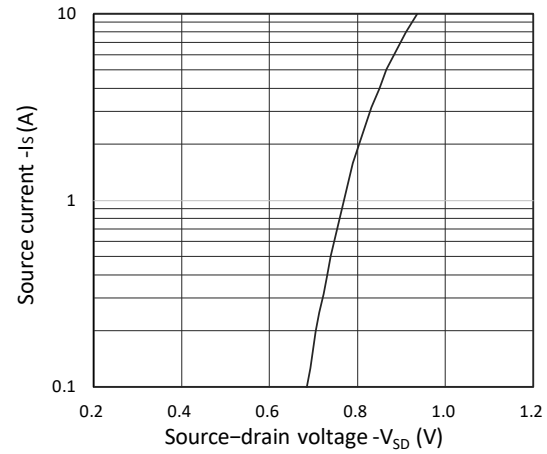


Figure 3. Forward Characteristics of Reverse

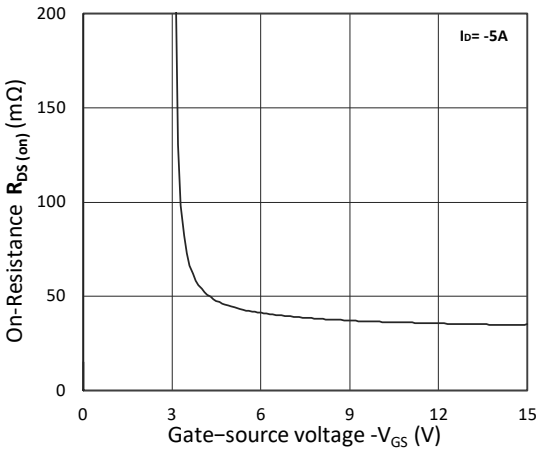


Figure 4. $R_{DS(ON)}$ vs. V_{GS}

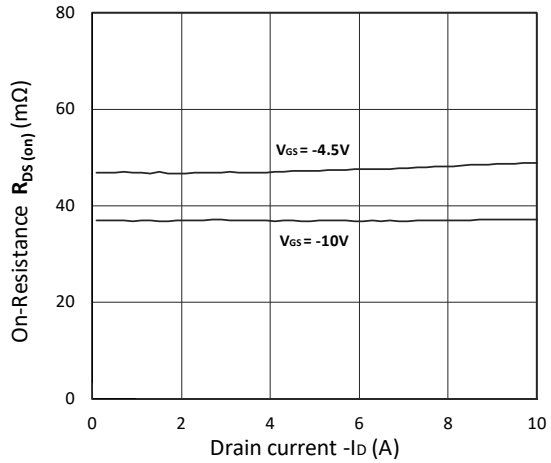


Figure 5. $R_{DS(ON)}$ vs. I_D

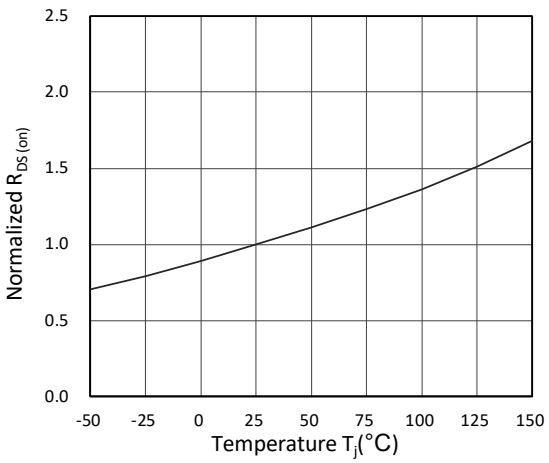


Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

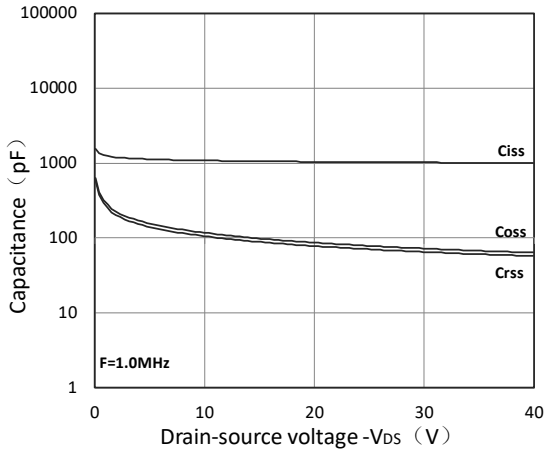


Figure 7. Capacitance Characteristics

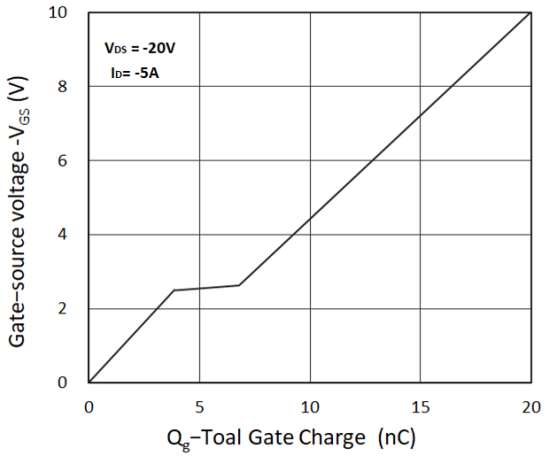


Figure 8. Gate Charge Characteristics

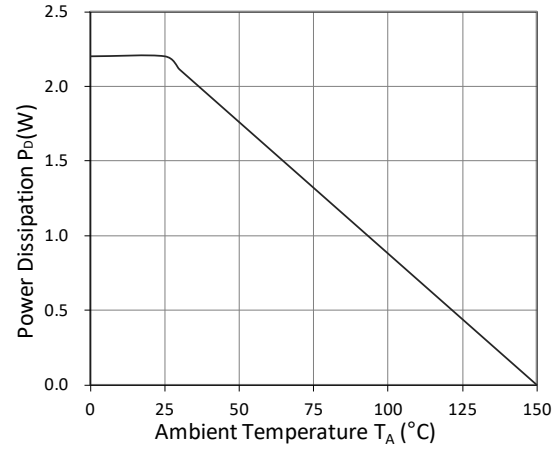
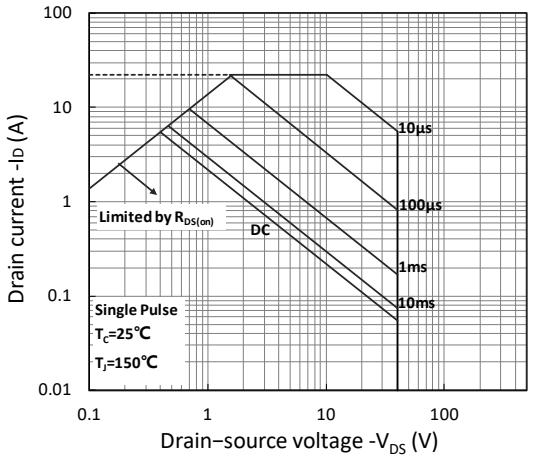


Figure 9. Power Dissipation



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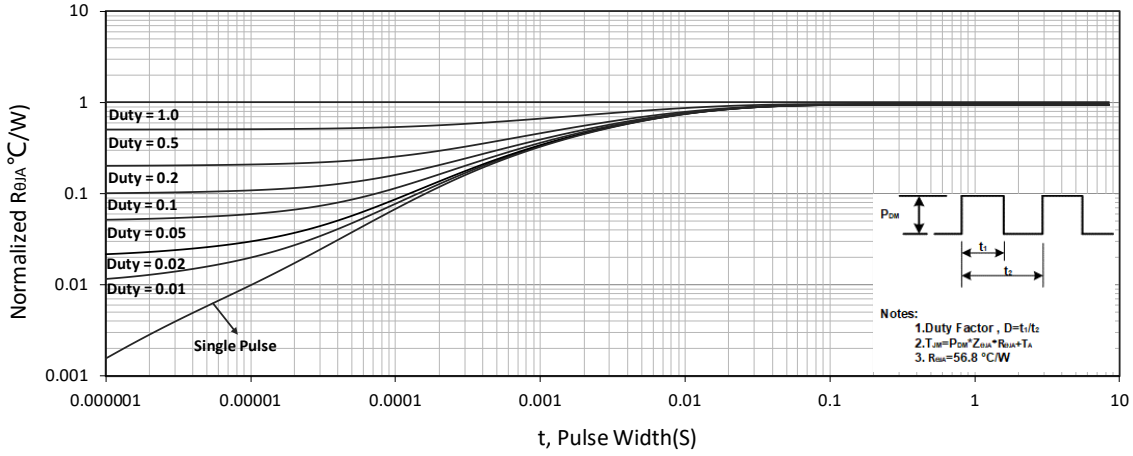
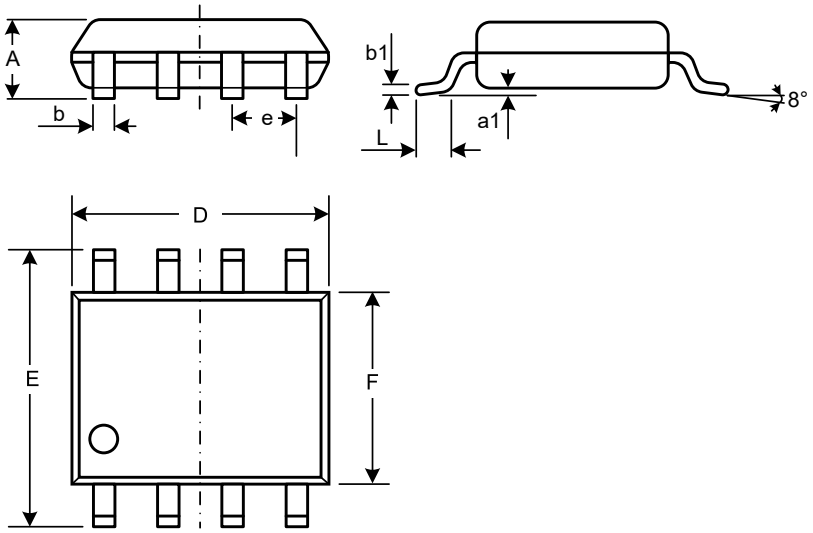


Figure 11. Normalized Maximum Transient Thermal Impedance

Mechanical Dimensions for SOP-8L



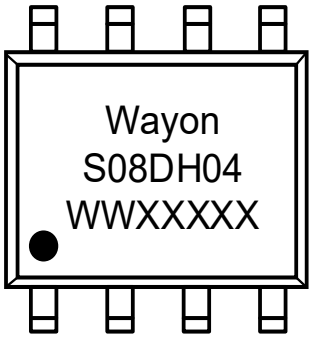
COMMON DIMENSIONS

SYMBOL	MM	
	MIN	MAX
A	1.35	1.75
a1	0.05	0.25
b	0.31	0.51
b1	0.16	0.25
D	4.70	5.15
E	5.75	6.25
e	1.07	1.47
F	3.70	4.10
L	0.40	1.27

Ordering Information

Part	Package	Marking	Packing method
WMS08DH04T1	SOP-8L	S08DH04	Tape and Reel

Marking Information



S08DH04 = Device code

WWXXXXX= Date code

Contact Information

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WAYON website: **http://www.way-on.com**
For additional information, please contact your local Sales Representative.

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