

Description:

This N+P Channel MOSFET uses advanced trench technology and design to provide excellent $R_{DS(on)}$ with low gate charge.

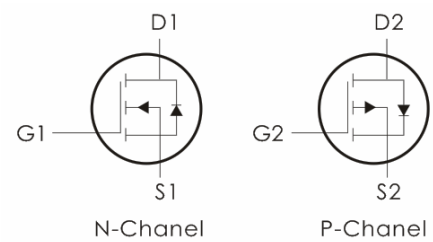
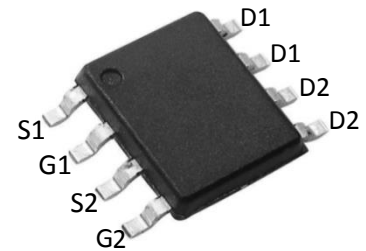
It can be used in a wide variety of applications.

Features:

N-Channel: $V_{DS}=30V, I_D=6.3A, R_{DS(on)}<24m\ \Omega @V_{GS}=10V$

P-Channel: $V_{DS}=-30V, I_D=-6A, R_{DS(on)}<45m\ \Omega @V_{GS}=-10V$

- 1) Low gate charge.
- 2) Green device available.
- 3) Advanced high cell density trench technology for ultra low $R_{DS(on)}$.
- 4) Excellent package for good heat dissipation.



Package Marking and Ordering Information:

Part NO.	Marking	Package	Packing
DOS4606H	S4606H	SOP-8D	3000 pcs/Reel

Absolute Maximum Ratings: ($T_C=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	N-Channel	P-Channel	Units
V_{DS}	Drain-Source Voltage	30	-30	V
V_{GS}	Gate-Source Voltage	± 20	± 20	V
I_D	Continuous Drain Current- $T_A=25^\circ\text{C}$	6.3	-6	A
	Continuous Drain Current- $T_A=100^\circ\text{C}$	4.5	-3.6	
I_{DM}	Pulsed Drain Current ¹	36	-20.4	A
P_D	Power Dissipation - $T_A=25^\circ\text{C}$	2.7	2.15	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150		$^\circ\text{C}$

Thermal Characteristics:

Symbol	Parameter	N-CH	P-CH	Units
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	46.3	58	$^{\circ}\text{C}/\text{W}$

N-Channel Electrical Characteristics: ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250 \mu\text{A}$	30	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{GS}=0V, V_{DS}=30V$	---	---	1	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0A$	---	---	± 100	nA
On Characteristics						
$V_{GS(th)}$	GATE-Source Threshold Voltage	$V_{GS}=V_{DS}, I_D=250 \mu\text{A}$	1	1.5	2.5	V
$R_{DS(on)}$	Drain-Source On Resistance ²	$V_{GS}=10V, I_D=5A$	---	18	24	m Ω
		$V_{GS}=4.5V, I_D=3A$	---	27	34	
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS}=15V, V_{GS}=0V, f=1\text{MHz}$	---	489	---	pF
C_{oss}	Output Capacitance		---	78	---	
C_{rss}	Reverse Transfer Capacitance		---	60	---	
Q_g	Gate Charge	$V_{GS}=10V, V_{DS}=15V$ $I_D=5A$	---	5.1	---	nC
Q_{gs}	Gate-Source Charge		---	0.8	---	
Q_{gd}	Gate-Drain Charge		---	1.2	---	
Switching Characteristics⁴						
$t_{d(on)}$	Turn-On Delay Time	$V_{DS}=15V, I_D=3A,$ $R_{REN}=3 \Omega, V_{GS}=10V$	---	4.4	---	ns
t_r	Rise Time		---	2.4	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	14.4	---	ns
t_f	Fall Time		---	3.4	---	ns
Drain-Source Diode Characteristics						
I_S	Continuous Drain to Source Diode	$V_D=V_G=0V$	---	---	6.3	A
I_{SM}	Pulsed Drain to Source Diode	$V_D=V_G=0V$	---	---	36	A

V_{SD}	Source-Drain Diode Forward Voltage	V _{GS} =0V, I _S =6.3A	---	0.9	1.2	V
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Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition : T_J=25°C, V_{DD}=15V, V_G=10V, L=0.5mH, R_g=25Ω, I_{AS}=7A
3. Pulse Test: Pulse Width≤300μs, Duty Cycles≤0.5%

N-Typical Characteristics: (T_C=25°C unless otherwise noted)

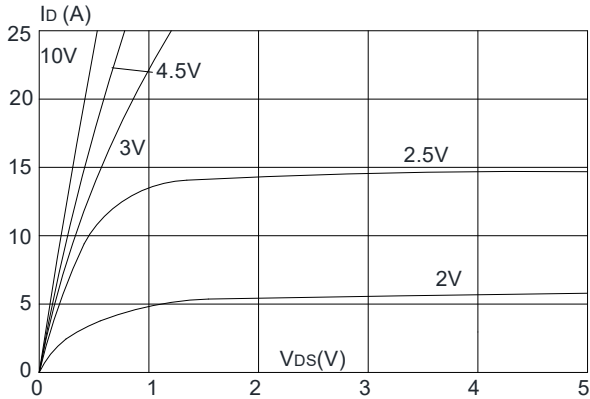


Figure 1: Output Characteristics

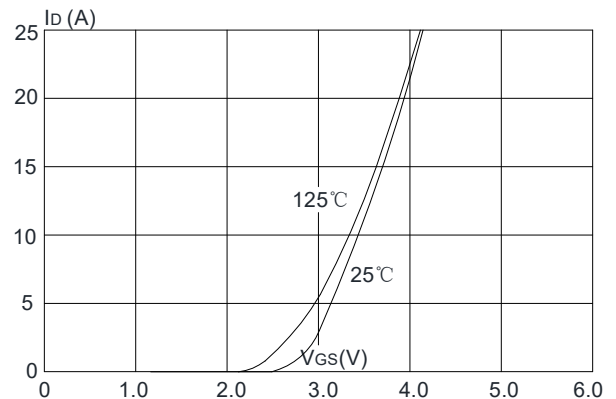


Figure 2: Typical Transfer Characteristics

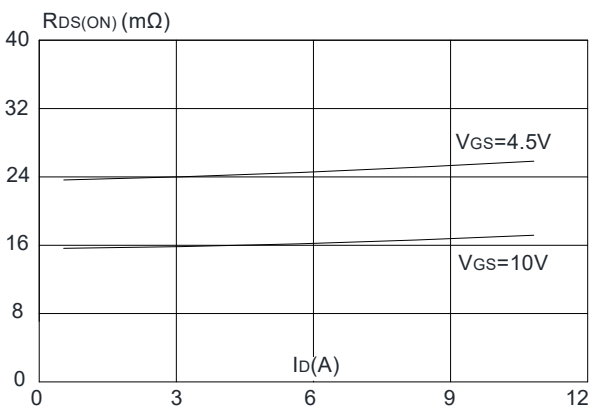


Figure 3: On-resistance vs. Drain Current

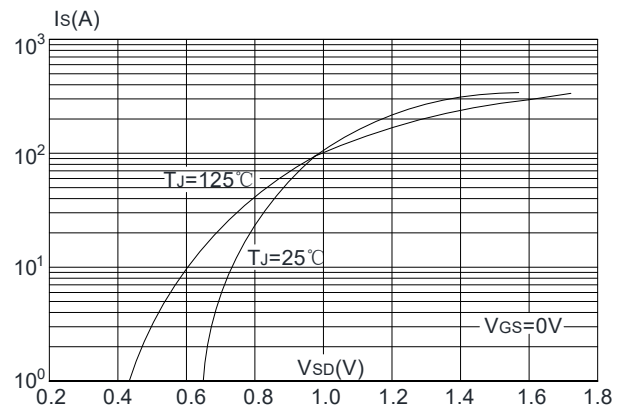


Figure 4: Body Diode Characteristics

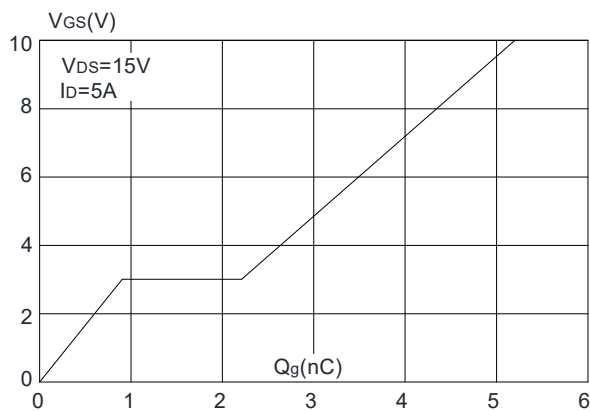


Figure 5: Gate Charge Characteristics

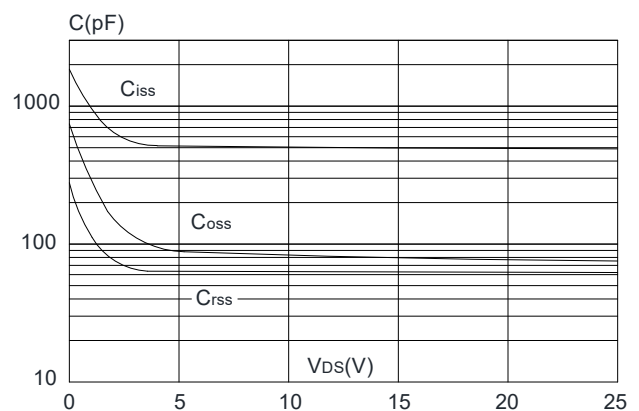


Figure 6: Capacitance Characteristics

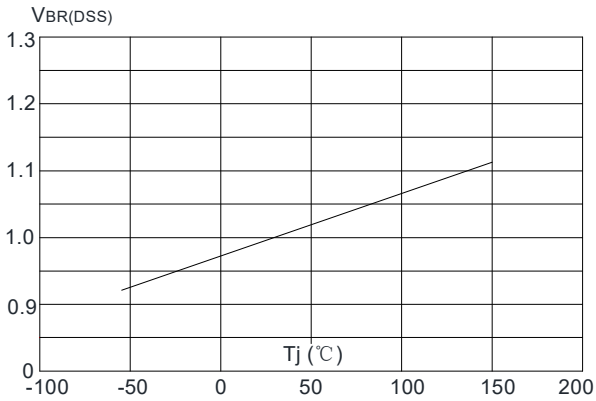


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

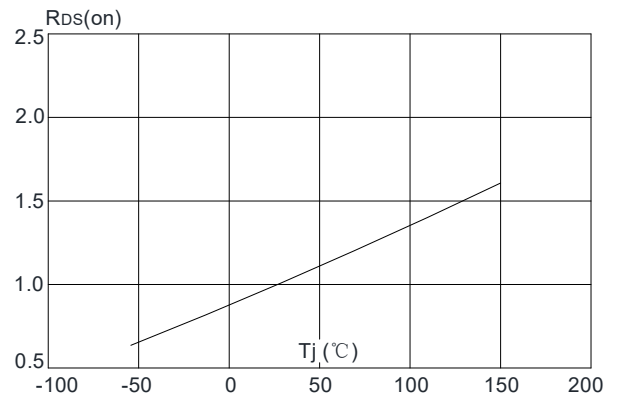


Figure 8: Normalized on Resistance vs. Junction Temperature

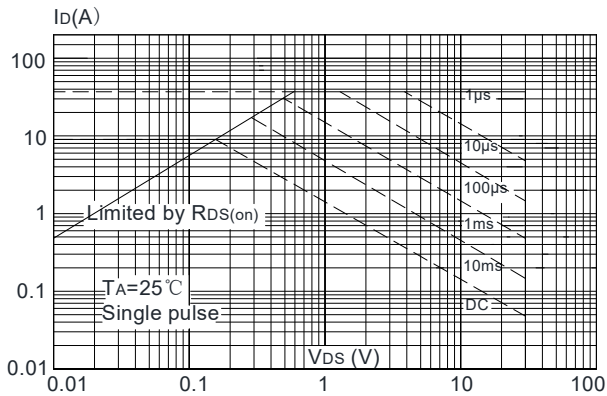


Figure 9: Maximum Safe Operating Area

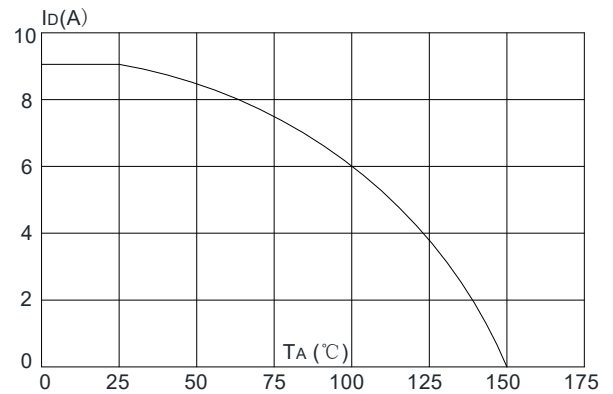


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

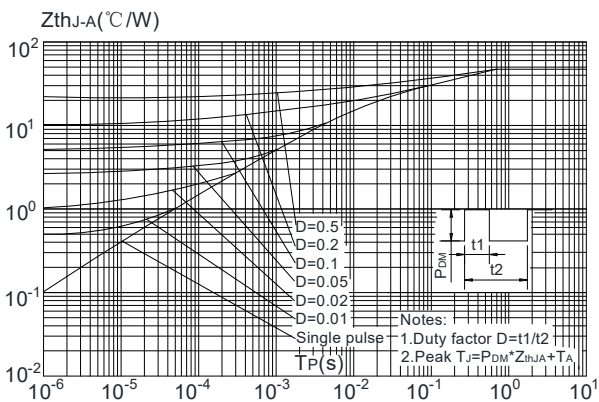


Figure 11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

P-Channel Electrical Characteristics: ($T_A=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\ \mu\text{A}$	-30	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{GS}=0V, V_{DS}=-30V$	---	---	-1	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0A$	---	---	± 100	nA
On Characteristics³						
$V_{GS(th)}$	GATE-Source Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\ \mu\text{A}$	-1	-1.6	-2.5	V
$R_{DS(on)}$	Drain-Source On Resistance ²	$V_{GS}=-10V, I_D=-5A$	---	36	45	m Ω
		$V_{GS}=-4.5V, I_D=-4A$	---	50	60	
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS}=-15V, V_{GS}=0V, f=1\text{MHz}$	---	579	---	pF
C_{oss}	Output Capacitance		---	97	---	
C_{rss}	Reverse Transfer Capacitance		---	73	---	
Switching Characteristics⁴						
$t_{d(on)}$	Turn-On Delay Time	$V_{DD}=-15V$ $V_{GS}=-10V, R_{GEN}=2.5\ \Omega$	---	13	---	ns
t_r	Rise Time		---	60	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	18	---	ns
t_f	Fall Time		---	9	---	ns
Q_g	Total Gate Charge		---	6.7	---	nC
Q_{gs}	Gate-Source Charge	$V_{GS}=-10V, V_{DS}=-15V,$	---	0.9	---	nC
Q_{gd}	Gate-Drain "Miller" Charge	$I_D=-5.1A$	---	1.3	---	nC
Drain-Source Diode Characteristics						
I_S	Continuous Drain to Source Diode	$V_D=V_G=0V$	---	---	-6	A
I_{SM}	Pulsed Drain to Source Diode	$V_D=V_G=0V$	---	---	-20.4	---
V_{SD}	Source-Drain Diode Forward Voltage	$V_{GS}=0V, I_S=-6A$	---	-0.8	-1.2	V

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%

P-Typical Characteristics: ($T_C=25^{\circ}\text{C}$ unless otherwise noted)

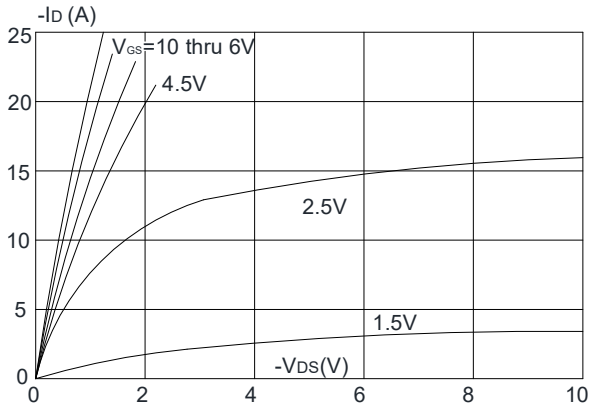


Figure 1: Output Characteristics

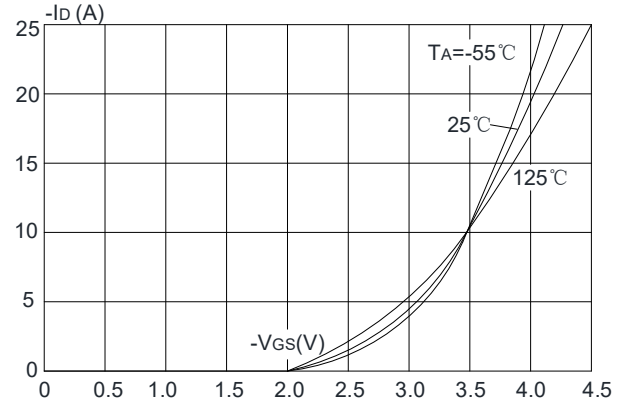


Figure 2: Typical Transfer Characteristics

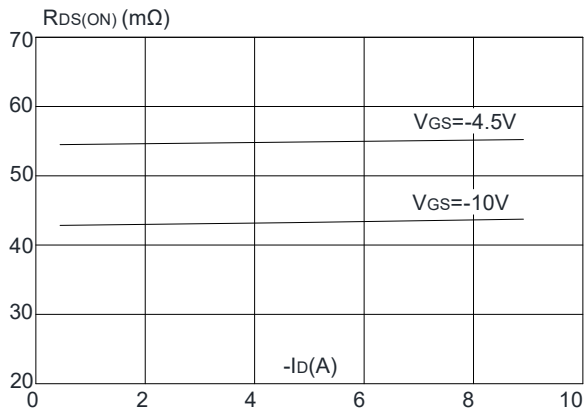


Figure 3: On-resistance vs. Drain Current

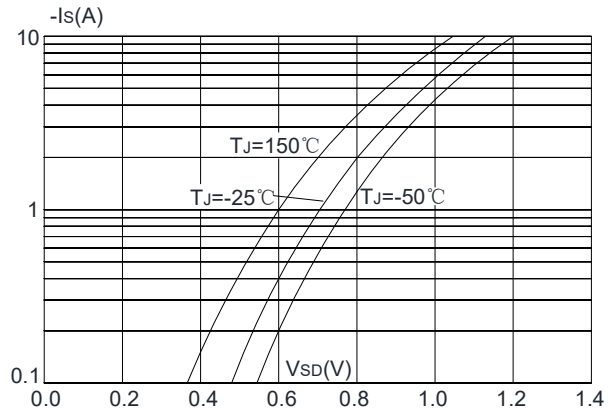


Figure 4: Body Diode Characteristics

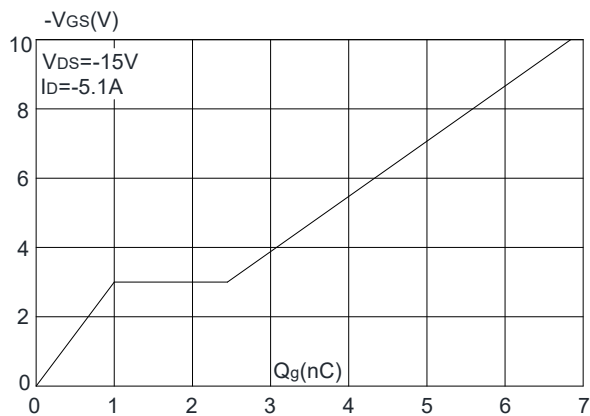


Figure 5: Gate Charge Characteristics

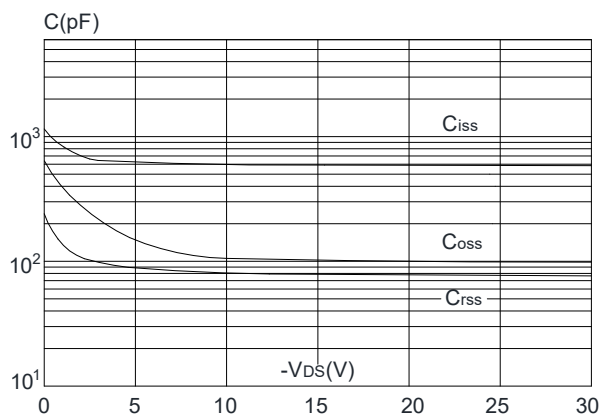


Figure 6: Capacitance Characteristics

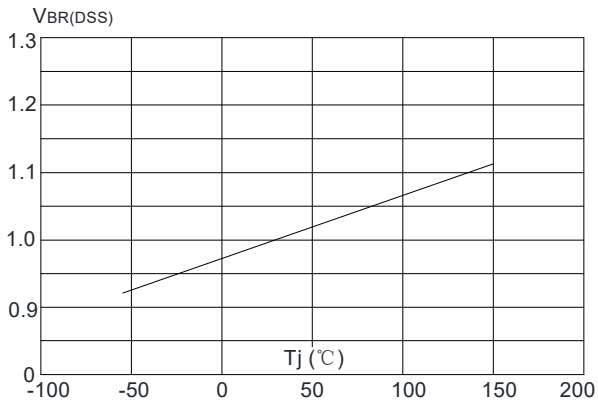


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

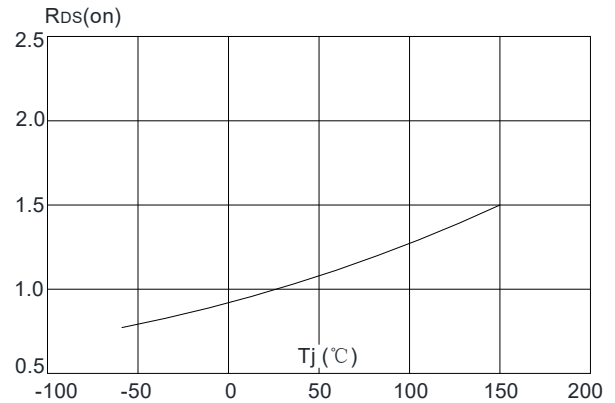


Figure 8: Normalized on Resistance vs. Junction Temperature

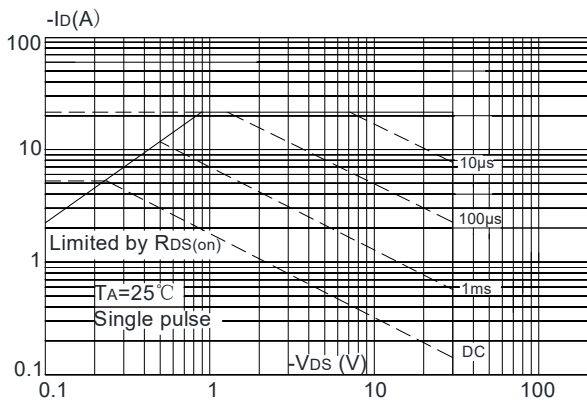


Figure 9: Maximum Safe Operating Area

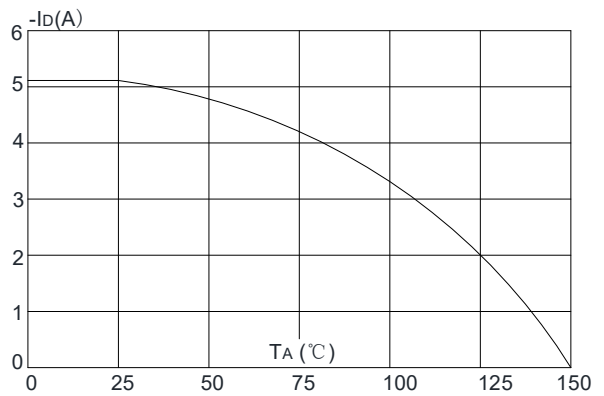


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

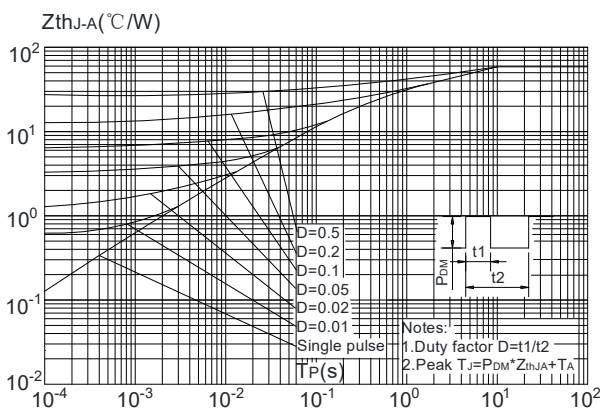
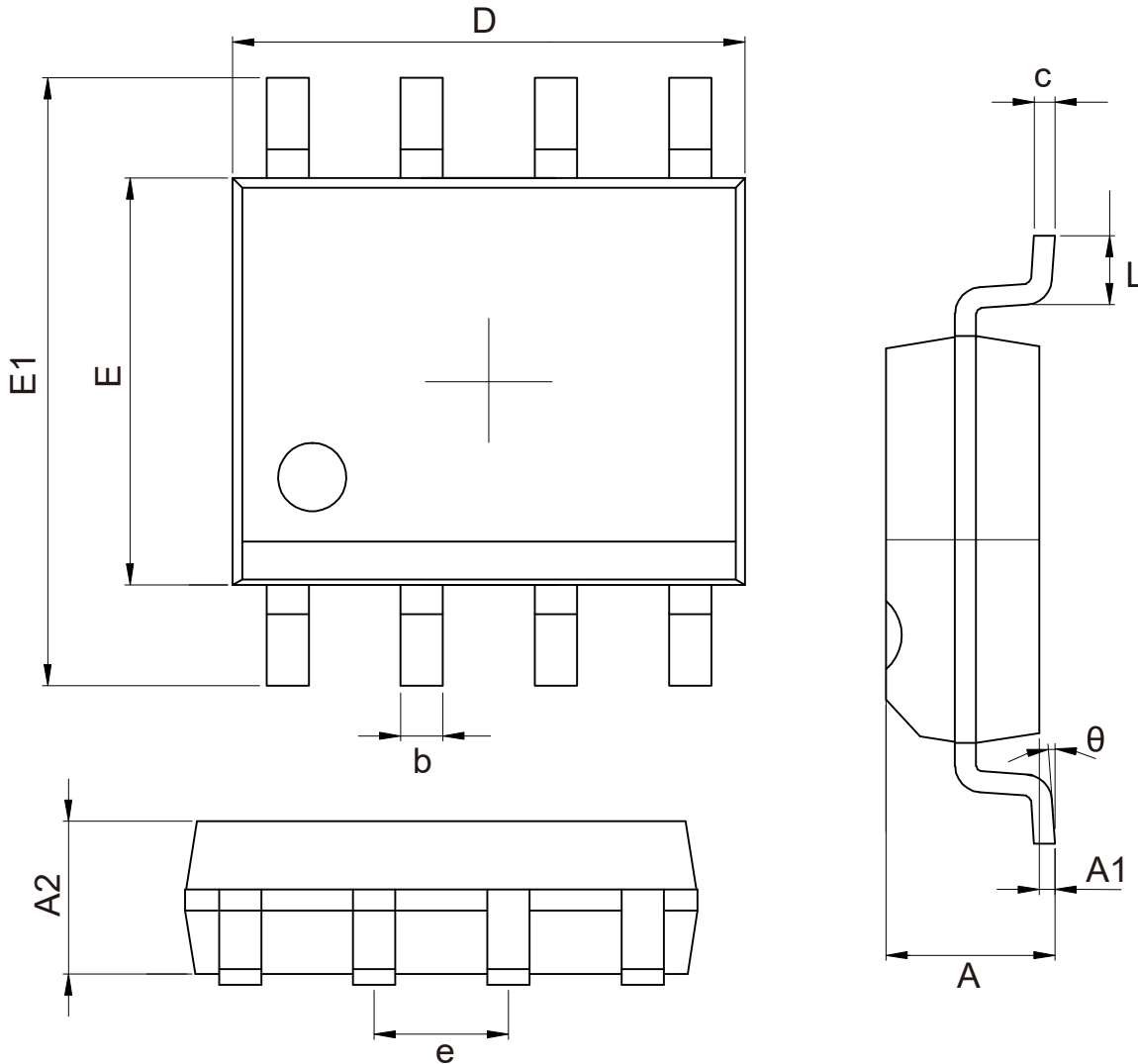


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

SOP-8DPackage Information:



COMMON DIMENSIONS			
UNITS MEASURE=MILLIMETER			
SYMBOL	MIN	NOM	MAX
A	1.350	---	1.750
A1	0.100	---	0.250
A2	1.350	---	1.550
b	0.330	---	0.510
c	0.170	---	0.250
D	4.700	---	5.100
E	3.800	3.900	4.000
E1	5.800	---	6.200
e	1.270BSC		
L	0.400	---	1.270
θ	0°	--	8°

Unit:mm

Marking Information:

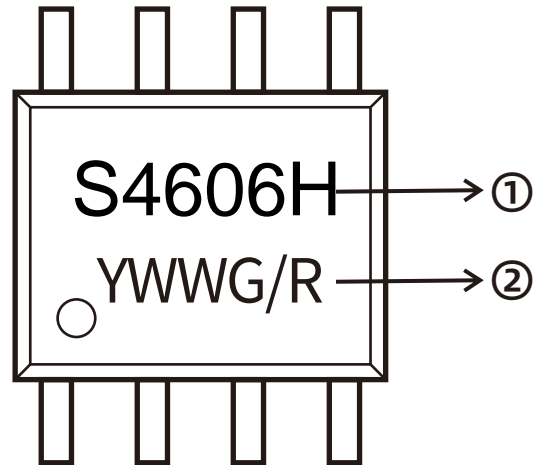
①. Part NO.


②. Date Code(YWWG / R)

Y : Year Code , last digit of the year

WW : Week Code(01-53)

G/R : G(Green) /R(Lead Free)

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