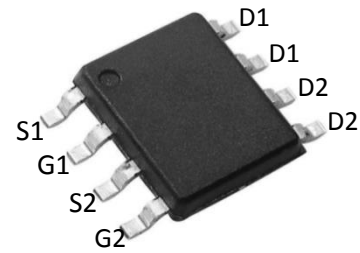


Description:

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.

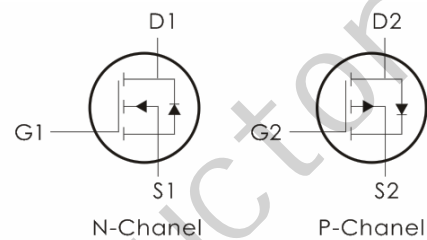


Features:

N-Channel: $V_{DS}=40V, I_D=8A, R_{DS(ON)} < 22m\Omega @ V_{GS}=10V$

P-Channel: $V_{DS}=-40V, I_D=-6A, R_{DS(ON)} < 53m\Omega @ V_{GS}=-10V$

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



Absolute Maximum Ratings: ($T_A=25^\circ C$ unless otherwise noted)

Symbol	Parameter	N-Channel	P-Channel	Units
V_{DS}	Drain-Source Voltage	40	-40	V
V_{GS}	Gate-Source Voltage	± 20	± 20	V
I_D	Continuous Drain Current- $T_A=25^\circ C$	8	-6	A
	Continuous Drain Current- $T_A=100^\circ C$	5.2	-3.9	
I_{DM}	Pulsed Drain Current ^{note1}	32	-24	A
E_{AS}	Single Pulsed Avalanche Energy ^{note2}	13	17.6	mJ
P_D	Power Dissipation - $T_A=25^\circ C$	2.0	3.2	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150		$^\circ C$

Thermal Characteristics:

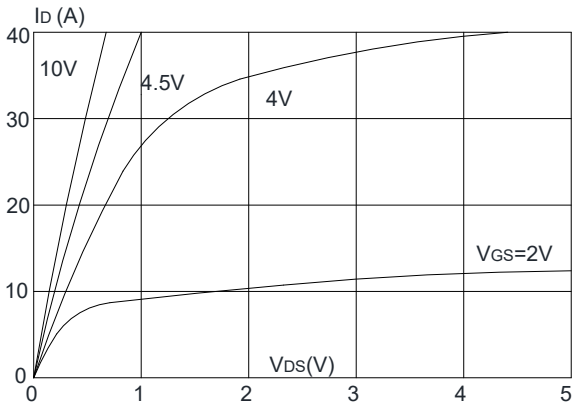
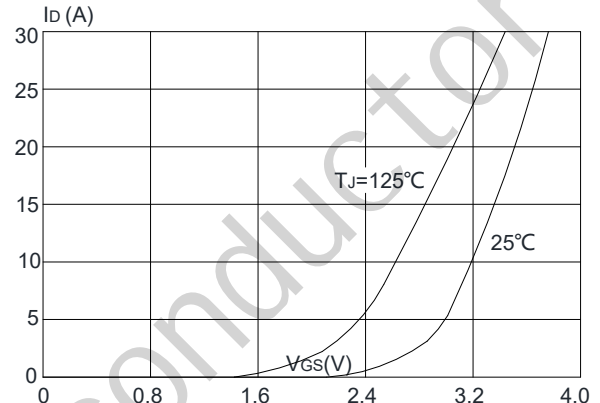
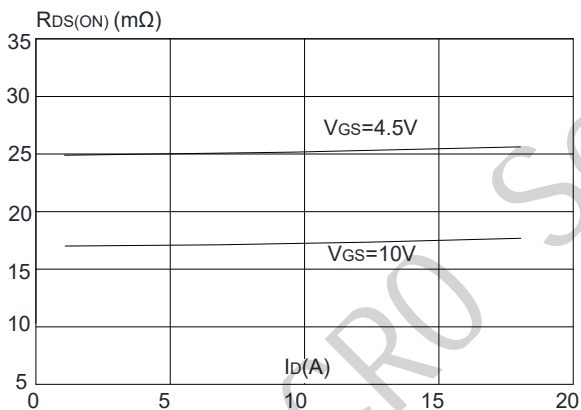
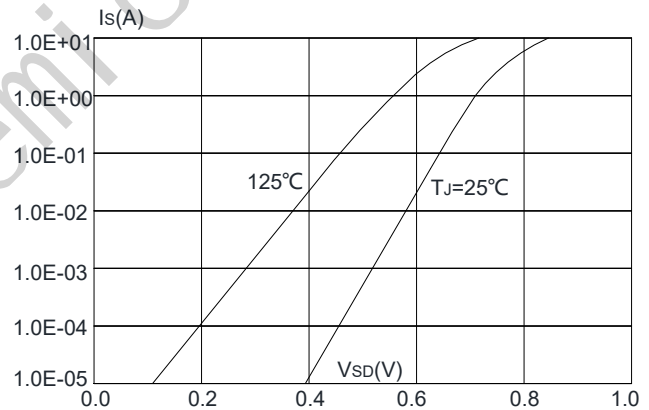
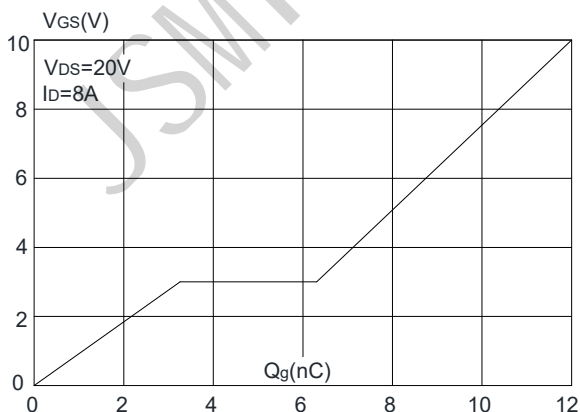
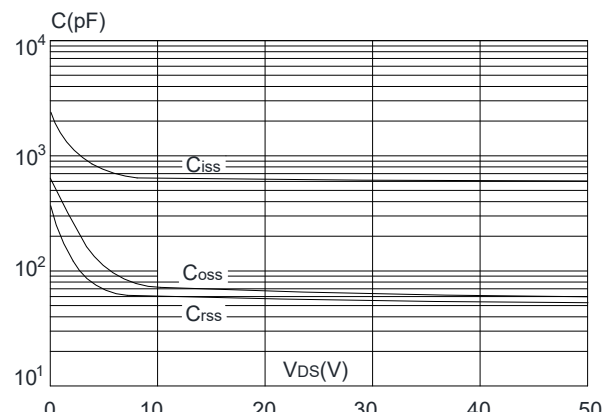
Symbol	Parameter	N-CH	P-CH	Units
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	62.5	39	$^\circ C/W$

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\ \mu\text{A}$	40	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{GS}=0V, V_{DS}=40V$	---	---	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	1.5	2.5	V
$R_{DS(on)}$	Drain-Source On Resistance ^{note3}	$V_{GS}=10V, I_D=8A$	---	17	22	m Ω
		$V_{GS}=4.5V, I_D=5A$	---	25	35	
Dynamic Characteristics⁴						
C_{iss}	Input Capacitance	$V_{DS}=20V, V_{GS}=0V, f=1\text{MHz}$	---	620	---	pF
C_{oss}	Output Capacitance		---	65	---	
C_{rss}	Reverse Transfer Capacitance		---	55	---	
Q_g	Gate Charge	$V_{GS}=8V, V_{DS}=20V$ $I_D=10A$	---	12	---	nC
Q_{gs}	Gate-Source Charge		---	3.2	---	
Q_{gd}	Gate-Drain Charge		---	3.1	---	
Switching Characteristics⁴						
$t_{d(on)}$	Turn-On Delay Time	$V_{DS}=20V, R_L=2.5\ \Omega,$ $R_{REN}=3\ \Omega, V_{GS}=10V$	---	4	---	ns
t_r	Rise Time		---	3	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	15	---	ns
t_f	Fall Time		---	2	---	ns
Drain-Source Diode Characteristics						
I_S	Continuous Drain to Source Diode	---	---	---	8	A
I_{SM}	Pulsed Drain to Source Diode	---	---	---	32	A
V_{SD}	Source-Drain Diode Forward Voltage	$V_{GS}=0V, I_S=8A$	---	---	1.2	V

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition : $T_J=25^\circ\text{C}$, $V_{DD}=20\text{V}$, $V_G=10\text{V}$, $L=0.5\text{mH}$, $R_g=25\Omega$, $I_{AS}=7.2\text{A}$
 $T_J=25^\circ\text{C}$, $V_{DD}=-20\text{V}$, $V_G=-10\text{V}$, $L=0.5\text{mH}$, $R_g=25\Omega$, $I_{AS}=-8.4\text{A}$
3. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$

Typical Performance Characteristics-N

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

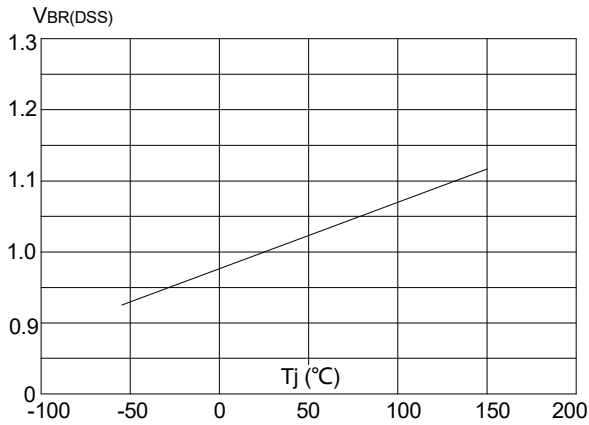


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

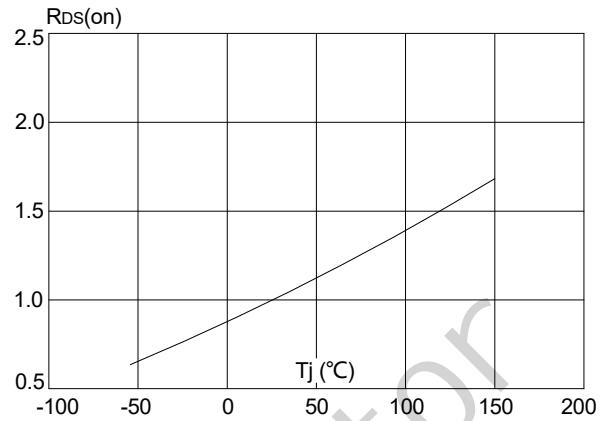


Figure 8: Normalized on Resistance vs. Junction Temperature

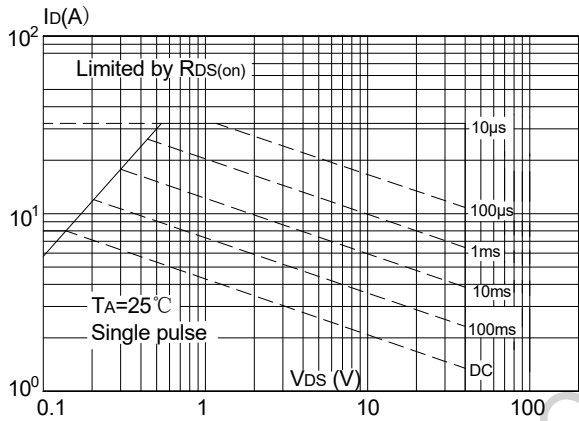


Figure 9: Maximum Safe Operating Area

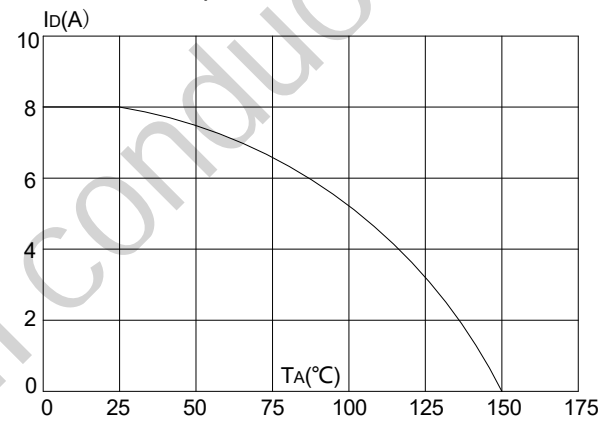


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

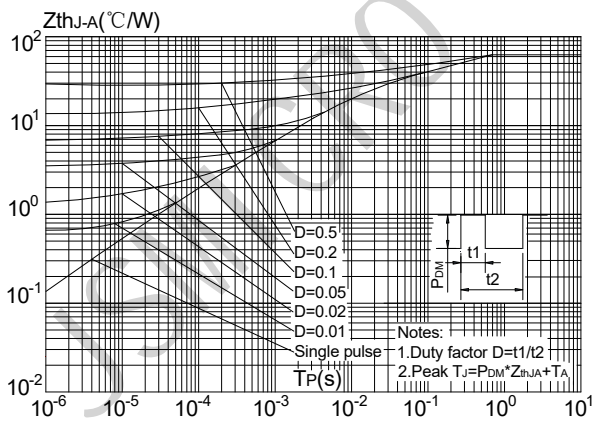


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\ \mu\text{A}$	-40	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{GS}=0V, V_{DS}=-40V$	---	---	-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 ^{note3}	$V_{GS}=-10V, I_D=-6A$	---	41	53	m Ω
		$V_{GS}=-4.5V, I_D=-4A$	---	58	81	
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS}=-20V, V_{GS}=0V, f=1\text{MHz}$	---	850	---	pF
C_{oss}	Output Capacitance		---	85	---	
C_{rss}	Reverse Transfer Capacitance		---	68	---	
Switching Characteristics⁴						
$t_{d(on)}$	Turn-On Delay Time	$V_{DD}=-20V, R_L=2.3\ \Omega$ $V_{GS}=-10V, R_{GEN}=6\ \Omega$	---	7.5	---	ns
t_r	Rise Time		---	5.5	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	19	---	ns
t_f	Fall Time		---	7	---	ns
Q_g	Total Gate Charge	$V_{GS}=-10V, V_{DS}=-20V, I_D=-6A$	---	13	---	nC
Q_{gs}	Gate-Source Charge		---	3.8	---	nC
Q_{gd}	Gate-Drain "Miller" Charge		---	3.1	---	nC
Drain-Source Diode Characteristics						
I_S	Continuous Drain to Source Diode	---	---	---	-6	A
I_{SM}	Pulsed Drain to Source Diode	---	---	---	-24	---
V_{SD}	Source-Drain Diode Forward Voltage	$V_{GS}=0V, I_S=-6A$	---	---	-1.2	V

Typical Performance Characteristics-P

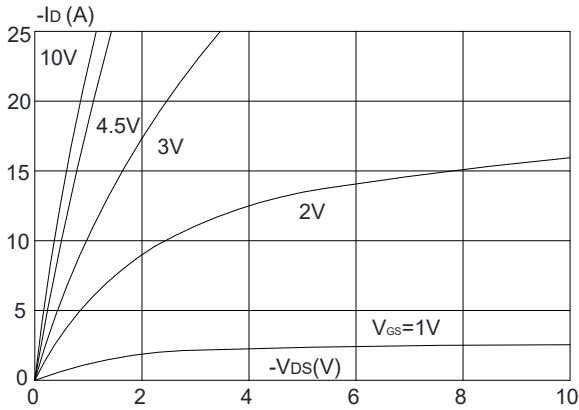


Figure 1: Output Characteristics

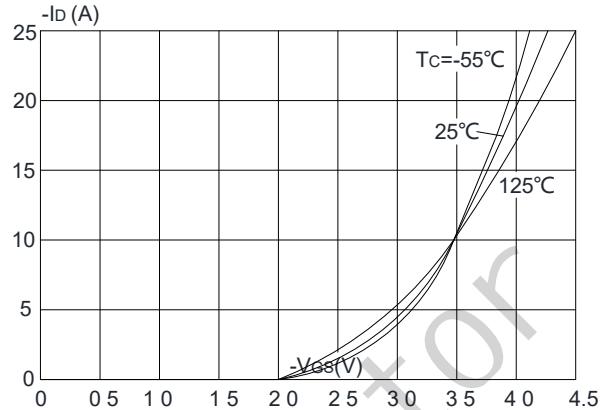


Figure 2: Typical Transfer Characteristics

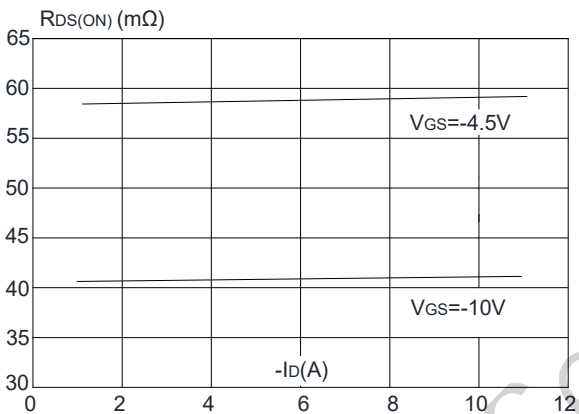


Figure 3: On-resistance vs. Drain Current

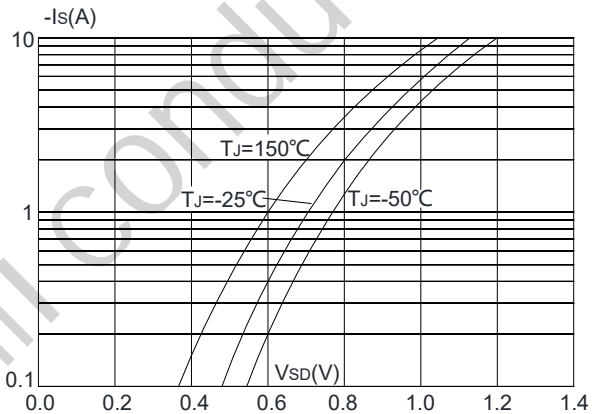


Figure 4: Body Diode Characteristics

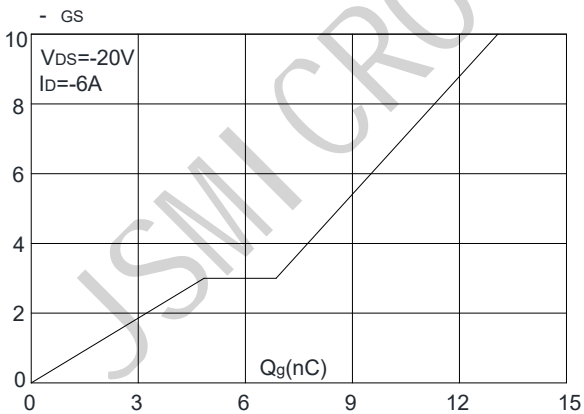


Figure 5: Gate Charge Characteristics

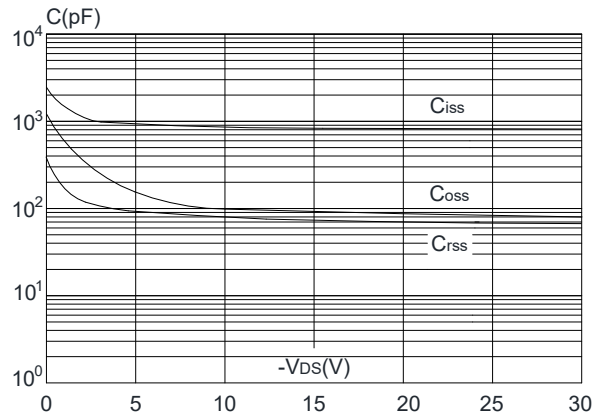


Figure 6: Capacitance Characteristics

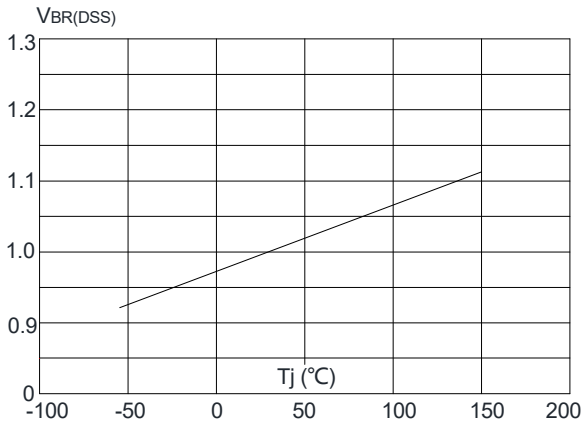


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

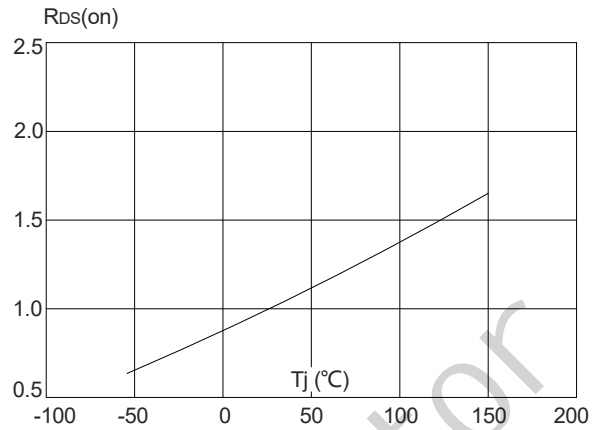


Figure 8: Normalized on Resistance vs. Junction Temperature

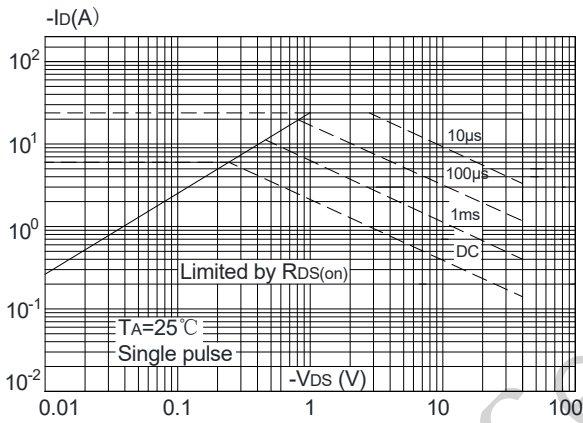


Figure 9: Maximum Safe Operating Area

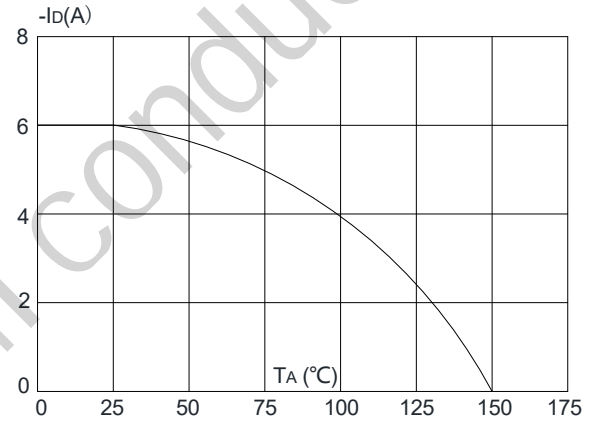


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

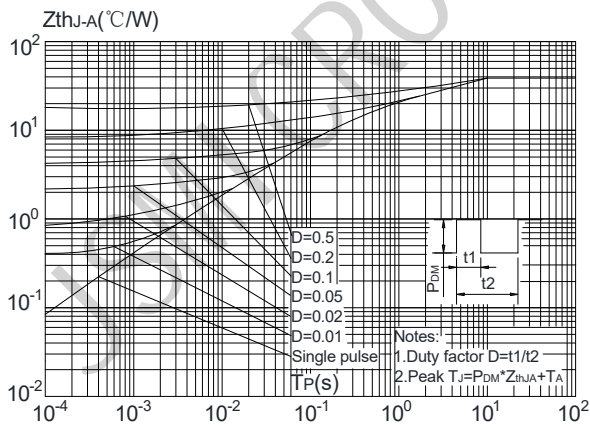
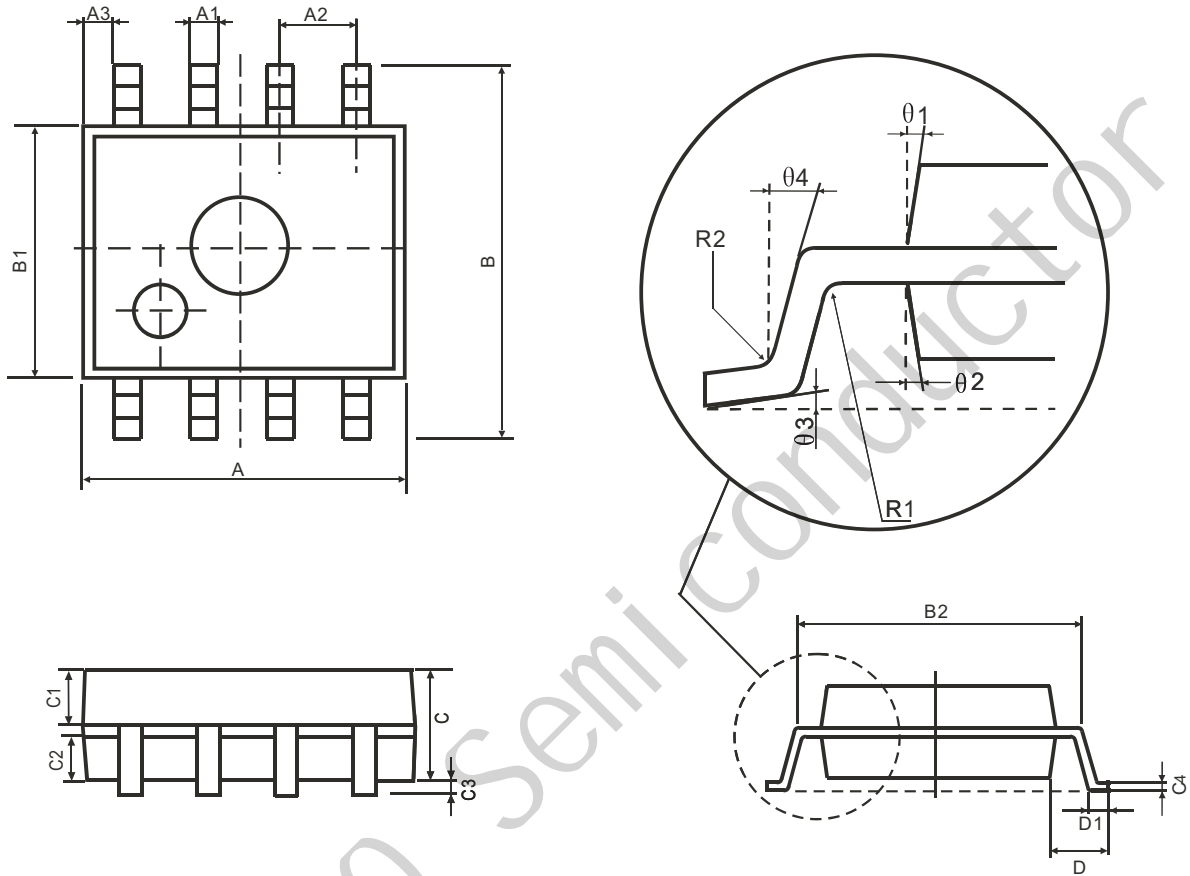


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

外形尺寸图 / Package Dimensions

SOP-8

Dimensions in mm



符号	尺寸(mm)		符号	尺寸(mm)	
	最小值	最大值		最小值	最大值
A	4.95	5.15	C3	0.05	0.20
A1	0.37	0.47	C4	0.20(典型值)	
A2	1.27(典型值)		D	1.05(典型值)	
A3	0.41(典型值)		D1	0.40	0.60
B	5.80	6.20	R1	0.07(典型值)	
B1	3.80	4.00	R2	0.07(典型值)	
B2	5.0(典型值)		θ1	17°(典型值)	
C	1.30	1.50	θ2	13°(典型值)	
C1	0.55	0.65	θ3	4°(典型值)	
C2	0.55	0.65	θ4	12°(典型值)	

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