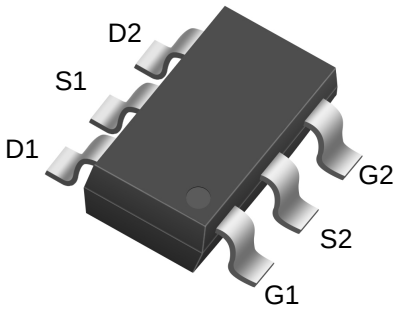
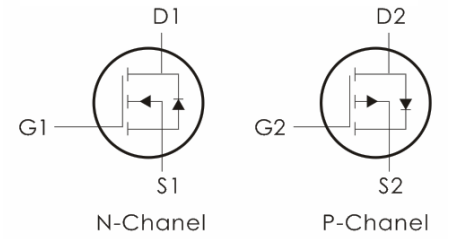
Description：

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}=20V,I_D=7A,$R_{DS(ON)}$<20mΩ @V_{GS}=4.5V（Type：15mΩ）

P-Channel: V_{DS}=-20V,I_D=-6A,$R_{DS(ON)}$<31mΩ @V_{GS}=-4.5V（Type：26mΩ）

1) Low gate charge.
2) Green device available.
3) Advanced high cell denity trench technology for ultra low $R_{DS(ON)}$.
4) Excellent package for good heat dissipation.
5) MSL3

Package Marking and Ordering Information：

Part NO.	Marking	Package	Packing
DO4604A	4604A	SOT-23-6	3000pcs/Reel

Absolute Maximum Ratings：（T_A=25℃ unless otherwise noted）

Symbol	Parameter	N-Channel	P-Channel	Units
V_{DS}	Drain-Source Voltage	20	-20	V
V_{GS}	Gate-Source Voltage	±12	±12	V
I_D	Continuous Drain Current- T_A=25℃ [1]	7	-6	A
	Continuous Drain Current-T_A=100℃ [1]	4.9	-4.2	
I_{DM}	Pulsed Drain Current [2]	28	-24	A
P_D	Power Dissipation - T_A=25℃	1	1	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150		℃

Thermal Characteristics：

Symbol	Parameter	N-CH	P-CH	Units
$R_{\theta JA}$	Thermal Resistance,Junction to Ambient	125	125	℃/W

Electrical Characteristics: (T_A=25℃ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Sourtce Breakdown Voltage	V_{GS}=0V,I_D=250μA	20	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{GS}=0V, V_{DS}=20V	---	---	1	μA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±12V, V_{DS}=0A	---	---	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate-Source Threshold Voltage	V_{GS}=V_{DS}, I_D=250μA	0.5	0.7	1	V
$R_{DS(ON)}$	Drain-Source On Resistance[3]	V_{GS}=4.5V,I_D=4A	---	15	20	mΩ
		V_{GS}=2.5V,I_D=3A	---	18	23	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=10V, V_{GS}=0V, f=1MHz	---	750	---	pF
C_{oss}	Output Capacitance		---	135	---	
C_{rss}	Reverse Transfer Capacitance		---	75	---	
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	V_{DS}=10V, I_D=3.5A, R_{ENG}=3Ω ,V_{GS}=4.5V	---	9	---	ns
t_r	Rise Time		---	30	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	35	---	ns
t_f	Fall Time		---	10	---	ns
Q_g	Total Gate Charge	V_{GS}=4.5V, V_{DS}=10V, I_D=3.5A	---	12	---	nC
Q_{gs}	Gate-Source Charge		---	2.3	---	nC
Q_{gd}	Gate-Drain “Miller” Charge		---	2.9	---	nC
Drain-Source Diode Characteristics						
V_{SD}	Diode Forward Voltage	V_{GS}=0V, I_{SD}=6.8A	---	---	1.2	V
I_S	Continuous Drain Curren	V_D=V_G=0V	---	---	7	A
I_{SM}	Pulsed Drain Current		---	---	28	A

Notes:

1. Computed continuous current assumes the condition of $T_{j,Max}$ while the actual continuous current depends on the thermal & electro-mechanical application board design
2. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

N-Typical Characteristics： (T_A=25℃ unless otherwise noted)

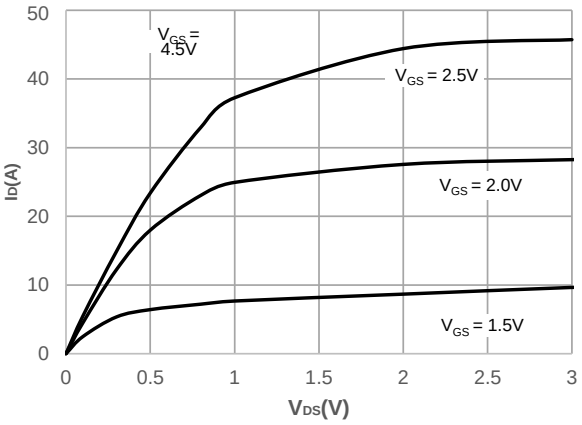


Figure 1: Output Characteristics

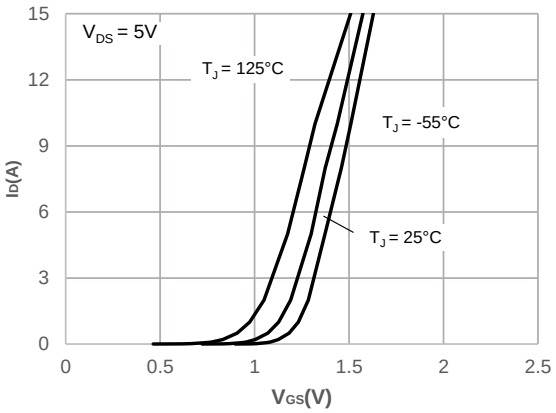


Figure 2: Typical Transfer Characteristics

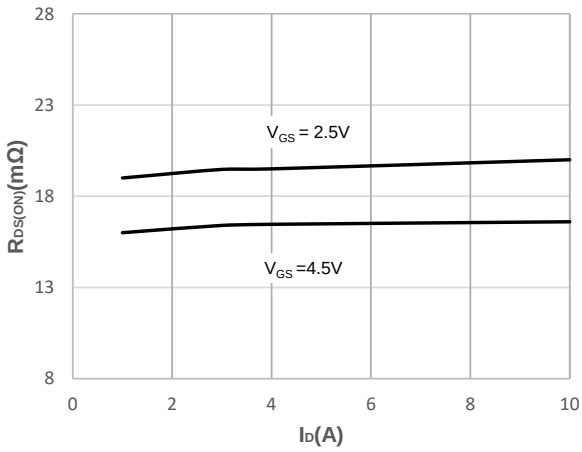


Figure 3: On-resistance vs. Drain Current

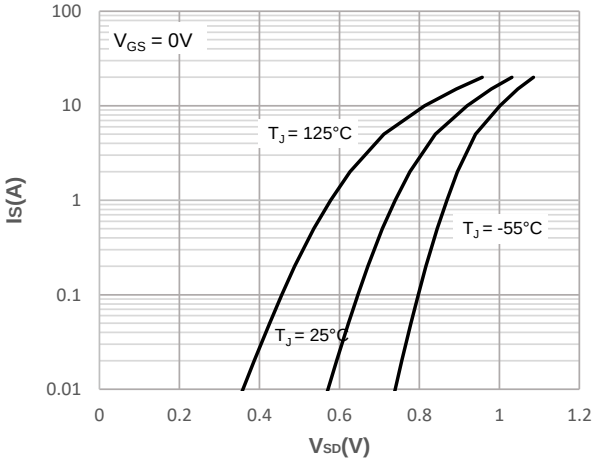


Figure 4: Body Diode Characteristics

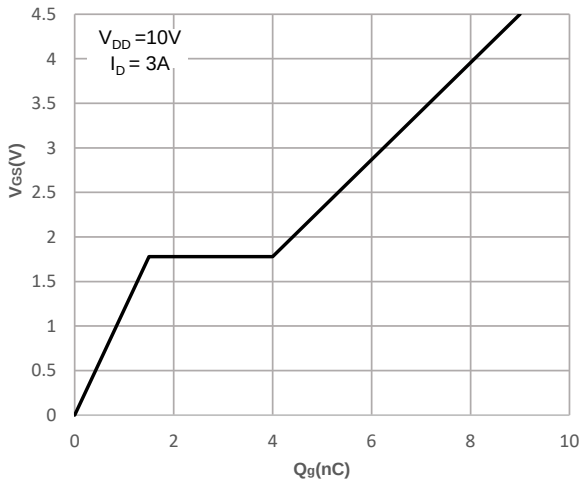


Figure 5: Gate Charge Characteristics

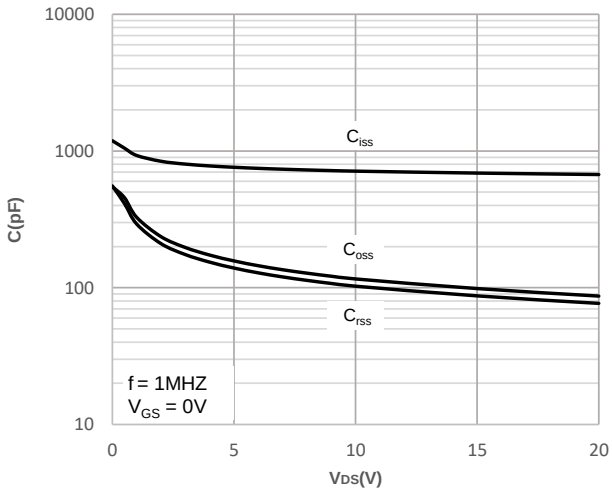


Figure 6: Capacitance Characteristics

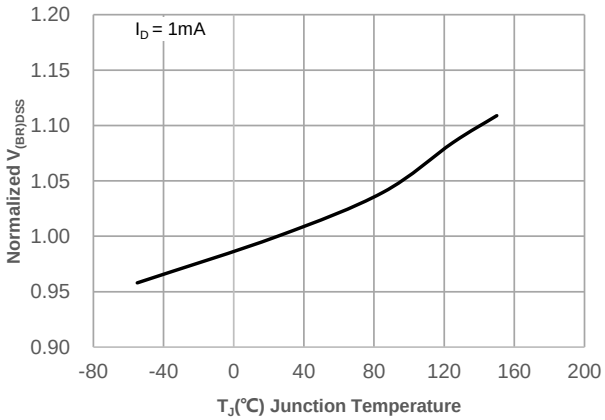


Figure 7: Normalized Breakdown voltage vs. Junction Temperature

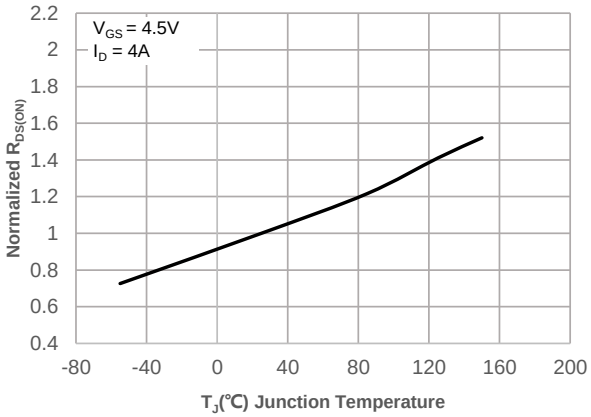


Figure 8: Normalized on Resistance vs. Junction Temperature

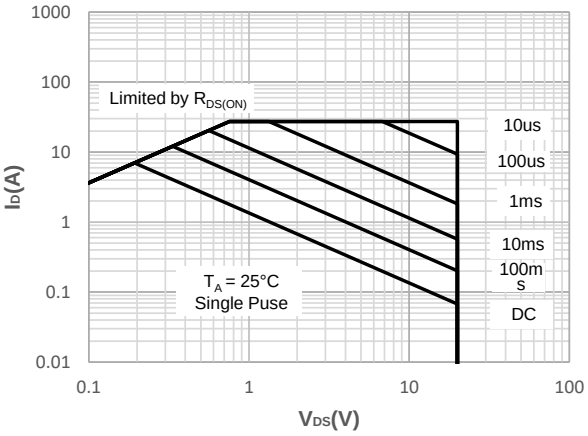


Figure 9: Maximum Safe Operating Area

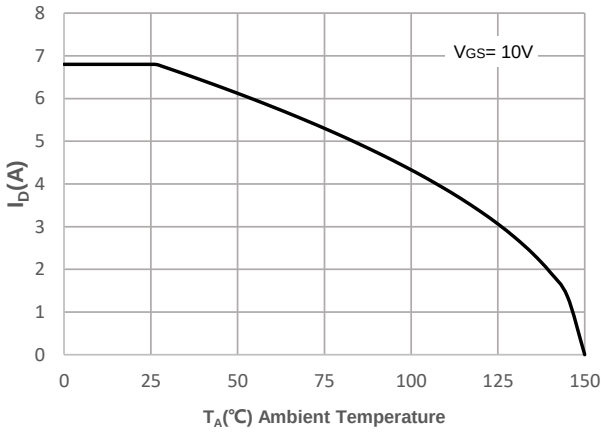


Figure 10: Maximum Continuous Drian Current vs. Ambient Temperature

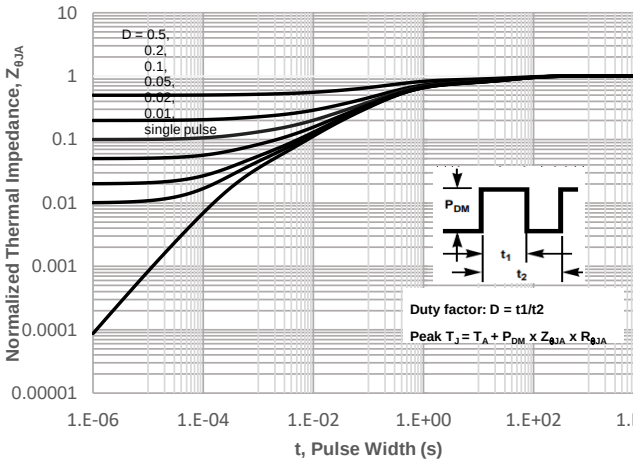


Figure 11: Normalized Maximum Transient Thermal Impedance

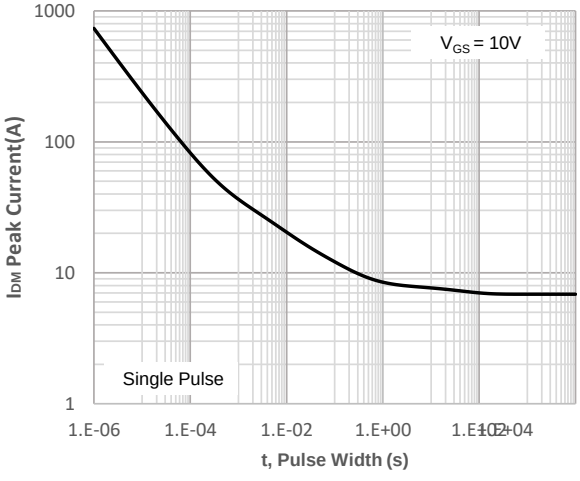


Figure 12: Peak Current Capacity

P-Channel Electrical Characteristics: (T_A=25℃ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Sourtce Breakdown Voltage	V_{GS}=0V,I_D=250μA	-20	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{GS}=0V, V_{DS}=-20V	---	---	-1	μA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±12V, V_{DS}=0A	---	---	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate-Source Threshold Voltage	V_{GS}=V_{DS}, I_D=250μA	-0.5	---	-1	V
$R_{DS(ON)}$	Drain-Source On Resistance[3]	V_{GS}=-4.5V,I_D=-4.1A	---	26	31	mΩ
		V_{GS}=-2.5V,I_D=-3A	---	31	36	
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=10V, V_{GS}=0V, f=1MHz	---	900	---	pF
C_{oss}	Output Capacitance		---	138	---	
C_{rss}	Reverse Transfer Capacitance		---	89	---	
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	V_{DD}= -10V， I_D=-3.3A V_{GS}= -4.5V, R_{GEN}=1Ω	---	10	---	ns
t_r	Rise Time		---	33	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	52	---	ns
t_f	Fall Time		---	53	---	ns
Q_g	Total Gate Charge	V_{GS}=-10V,V_{DS}=-4.5V, I_D=-2A	---	9.24	---	nC
Q_{gs}	Gate-Source Charge		---	1.4	---	nC
Q_{gd}	Gate-Drain “Miller” Charge		---	1.9	---	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		---	---	-24	A
V_{SD}	Source-Drain Diode Forward Voltage	V_{GS}=0V,I_S=-4.1A	---	---	-1.2	V

Notes:

1. Computed continuous current assumes the condition of $T_{j,Max}$ while the actual continuous current depends on the thermal & electro-mechanical application board design
2. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

P-Typical Characteristics: (T_A=25℃ unless otherwise noted)

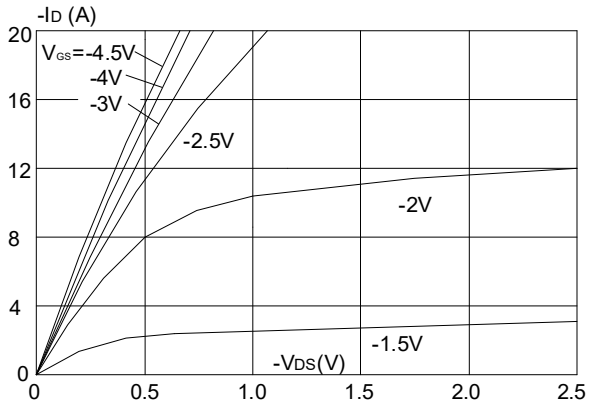


Figure1: Output Characteristics

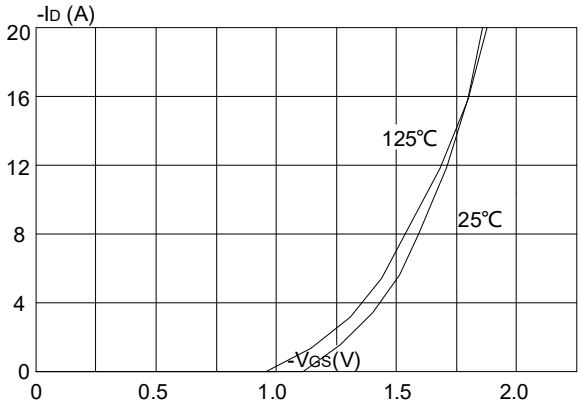


Figure 2: Typical Transfer Characteristics

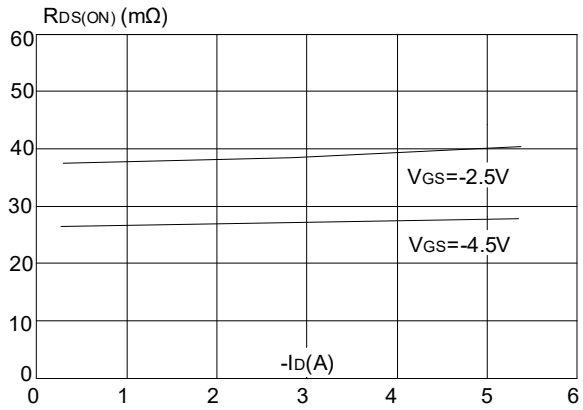


Figure 3: On-resistance vs. Drain Current

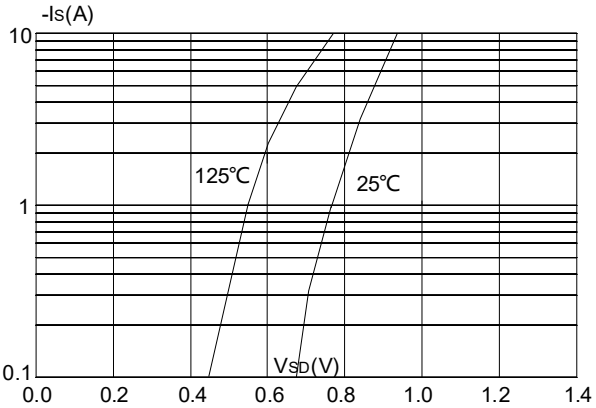


Figure 4: Body Diode Characteristics

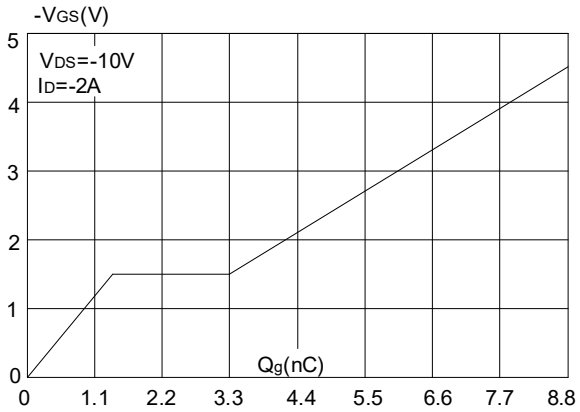


Figure 5: Gate Charge Characteristics

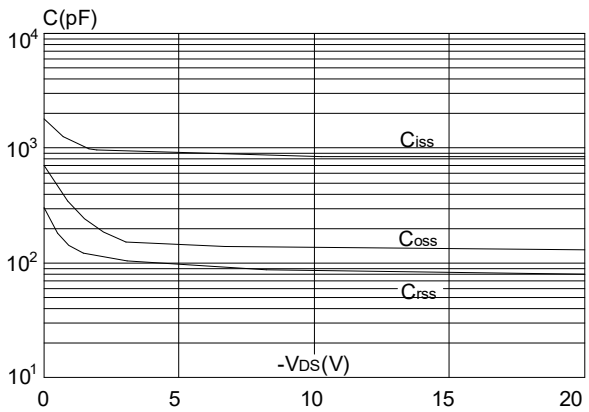


Figure 6: Capacitance Characteristics

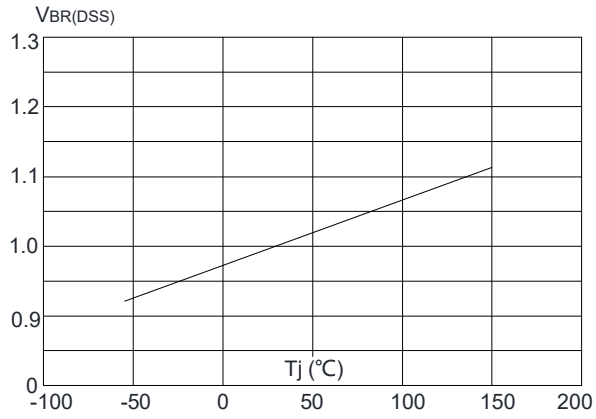


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

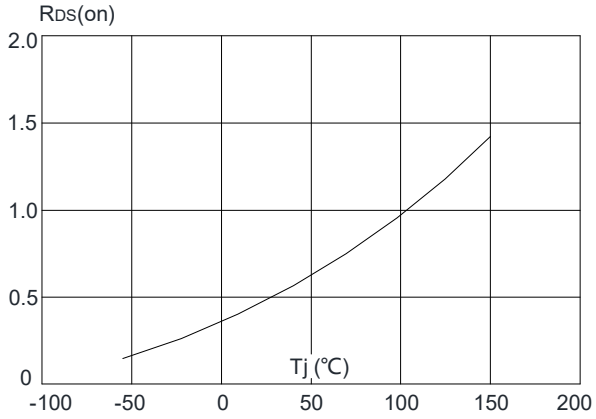


Figure 8: Normalized on Resistance vs. Junction Temperature

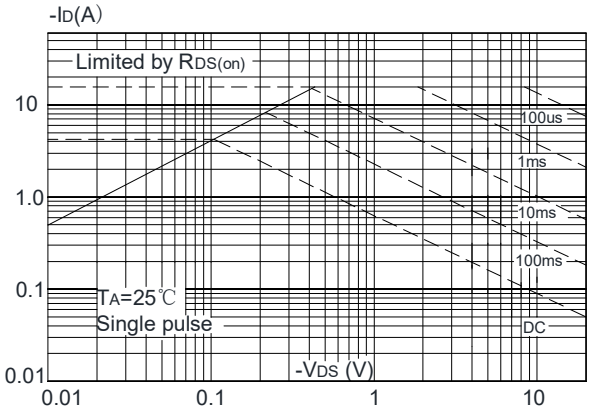


Figure 9: Maximum Safe Operating Area

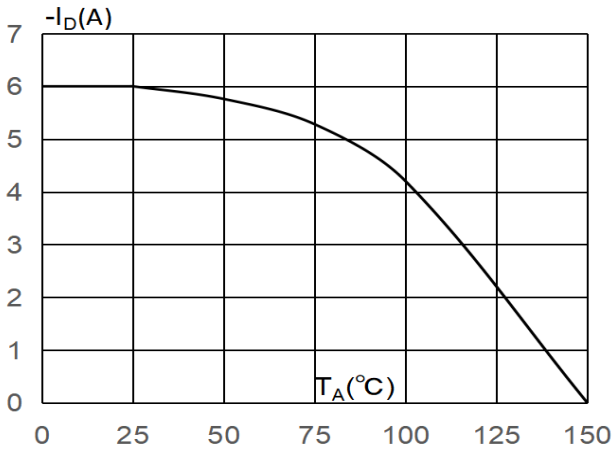


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

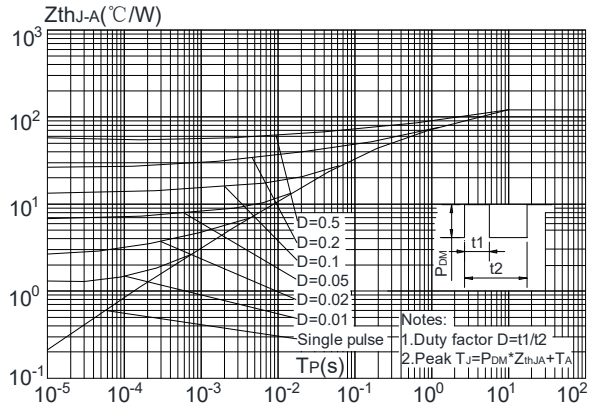
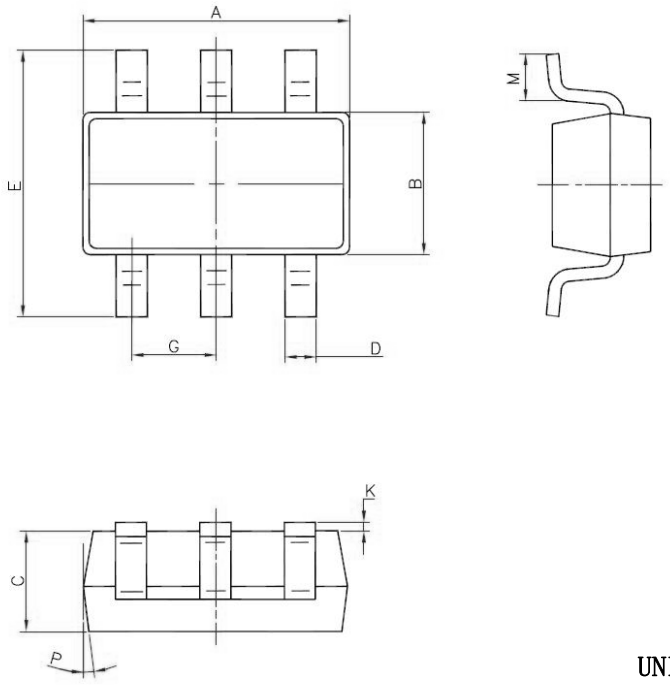


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

SOT-23-6 Package Outline Data

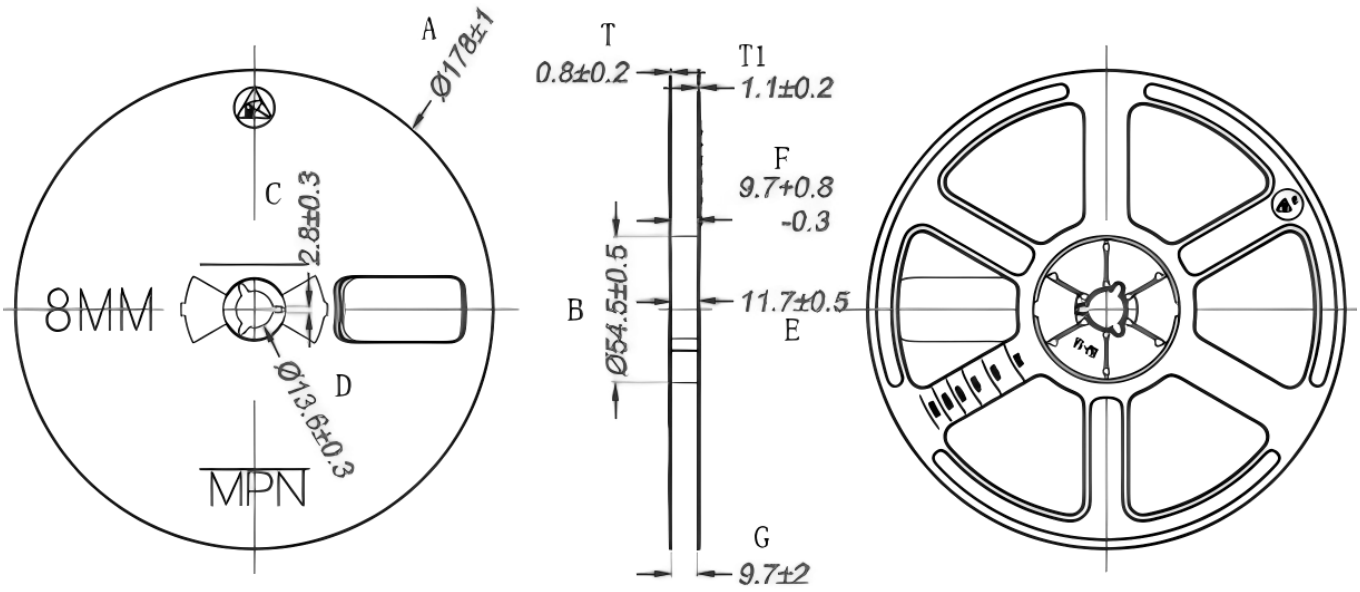


UNIT: mm

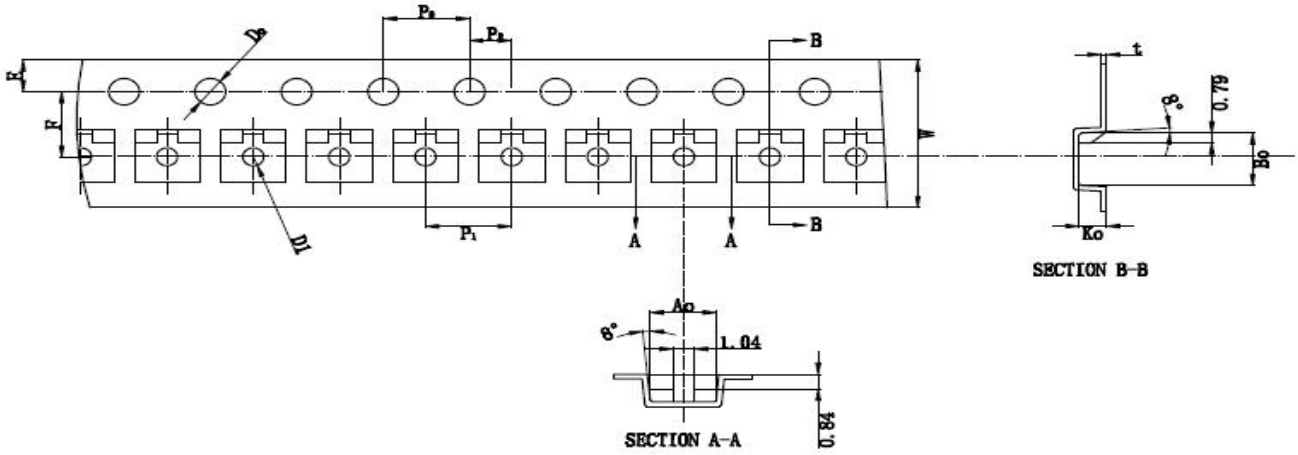
DIM	MILLIMETERS
A	2.82~3.02
B	1.60 ± 0.10
C	1.10 ± 0.05
D	0.40 ± 0.10
E	2.65~2.95
G	0.95typ
K	0.00~0.10
M	0.20MIN
P	9 ± 2°

Tape & Reel Information

Dimensions in mm

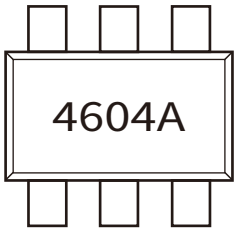


PKG TYPE	W	P	E	F	D	D1	Po	Po10	P2	A0	B0	K0	T
SOT23-6	8.00	4.00	1.75	3.50	1.50	1.00	4.00	40.00	2.00	3.13	3.22	1.30	0.20
Tolerance	±0.2	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.2	±0.1	±0.1	±0.1	±0.1	±0.03



Pulling direction

Marking Information：



Previous Version

Version	Date	Subjects (major changes since last revision)
1.2	2026-05-02	Release of final version

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