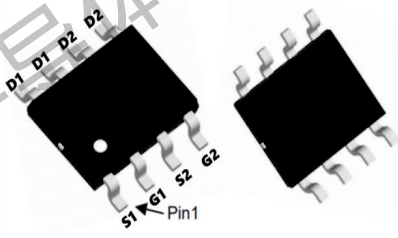
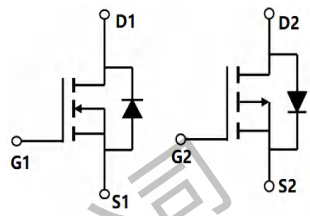


TM4618A

N+P-Channel Enhancement Mode Mosfet

General Description • Low R_{DS(ON)} • RoHS and Halogen-Free Compliant Applications • Load switch • PWM	General Features N Channel V_{DS} = 40V, I_D=12A R_{DS(ON)}=12 mΩ (typ.)@ V_{GS}=10V P Channel V_{DS} = -40V, I_D=-11A R_{DS(ON)}=14 mΩ (typ.)@ V_{GS}=-10V 100% UIS Tested 100% R_g Tested 																																																																			
D1 D1 D2 D2 S1 G1 S2 G2 PIN#1 Marking: 4618A S:SOP-8L  																																																																				
Absolute Maximum Ratings (T_A=25℃ unless otherwise noted) <table><tr><th rowspan="2">Symbol</th><th rowspan="2">Parameter</th><th colspan="2">Rating</th><th rowspan="2">Units</th></tr><tr><th>N-Channel</th><th>P-Channel</th></tr><tr><td>V_{DS}</td><td>Drain-Source Voltage</td><td>40</td><td>-40</td><td>V</td></tr><tr><td>V_{GS}</td><td>Gate-Source Voltage</td><td>±20</td><td>±20</td><td>V</td></tr><tr><td>I_D@T_A=25℃</td><td>Continuous Drain Current, V_{GS} @ 10V</td><td>12</td><td>-11</td><td>A</td></tr><tr><td>I_D@T_A=100℃</td><td>Continuous Drain Current, V_{GS} @ 10V</td><td>6</td><td>-6</td><td>A</td></tr><tr><td>I_{DM}</td><td>Pulsed Drain Current¹</td><td>38</td><td>-40</td><td>A</td></tr><tr><td>EAS</td><td>Single Pulse Avalanche Energy²</td><td>28.5</td><td>50</td><td>mJ</td></tr><tr><td>P_D@T_A=25℃</td><td>Total Power Dissipation</td><td>1.55</td><td>2</td><td>W</td></tr><tr><td>T_{STG}</td><td>Storage Temperature Range</td><td>-55 to 175</td><td>-55 to 175</td><td>℃</td></tr><tr><td>T_J</td><td>Operating Junction Temperature Range</td><td>-55 to 175</td><td>-55 to 175</td><td>℃</td></tr></table> Thermal Data <table><tr><th>Symbol</th><th>Parameter</th><th>Typ.</th><th>Max.</th><th>Unit</th></tr><tr><td>R_{θJA}</td><td>Thermal Resistance Junction-Ambient</td><td>---</td><td>85</td><td>℃/W</td></tr><tr><td>R_{θJC}</td><td>Thermal Resistance Junction-Case</td><td>---</td><td>62.5</td><td>℃/W</td></tr></table>		Symbol	Parameter	Rating		Units	N-Channel	P-Channel	V _{DS}	Drain-Source Voltage	40	-40	V	V _{GS}	Gate-Source Voltage	±20	±20	V	I _D @T _A =25℃	Continuous Drain Current, V _{GS} @ 10V	12	-11	A	I _D @T _A =100℃	Continuous Drain Current, V _{GS} @ 10V	6	-6	A	I _{DM}	Pulsed Drain Current ¹	38	-40	A	EAS	Single Pulse Avalanche Energy ²	28.5	50	mJ	P _D @T _A =25℃	Total Power Dissipation	1.55	2	W	T _{STG}	Storage Temperature Range	-55 to 175	-55 to 175	℃	T _J	Operating Junction Temperature Range	-55 to 175	-55 to 175	℃	Symbol	Parameter	Typ.	Max.	Unit	R _{θJA}	Thermal Resistance Junction-Ambient	---	85	℃/W	R _{θJC}	Thermal Resistance Junction-Case	---	62.5	℃/W
Symbol	Parameter			Rating			Units																																																													
		N-Channel	P-Channel																																																																	
V _{DS}	Drain-Source Voltage	40	-40	V																																																																
V _{GS}	Gate-Source Voltage	±20	±20	V																																																																
I _D @T _A =25℃	Continuous Drain Current, V _{GS} @ 10V	12	-11	A																																																																
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TM4618A

N+P-Channel Enhancement Mode Mosfet

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 μ A	40	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{GS} =0V, V _{DS} =40V	---	---	1	μ A
I _{GSS}	Gate-Source Leakage Current	V _{GS} = ± 20V, V _{DS} =0A	---	---	± 100	nA
On Characteristics ³						
V _{GS(th)}	Gate-Source Threshold Voltage	V _{GS} =V _{DS} , I _D =250 μ A	1.2	1.6	2.0	V
R _{DS(ON)}	Drain-Source On Resistance ⁴	V _{GS} =10V, I _D =10A	---	12	15	m Ω
		V _{GS} =4.5V, I _D =5A	---	15	20	
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =20V, V _{GS} =0V, f=1MHz	---	1274	---	pF
C _{oss}	Output Capacitance		---	91.3	---	
C _{rss}	Reverse Transfer Capacitance		---	75.6	---	
Q _g	Gate Charge	V _{GS} =10V , V _{DS} =20V I _D =10A	---	27.3	---	nC
Q _{gs}	Gate-Source Charge		---	6.3	---	
Q _{gd}	Gate-Drain Charge		---	5.2	---	
Switching Characteristics ⁴						
t _{d(on)}	Turn-On Delay Time	V _{DD} =20V, I _D = 10A, R _{REN} =3 Ω ,V _{GS} =10V	---	7.35	---	ns
t _r	Rise Time		---	11.55	---	ns
t _{d(off)}	Turn-Off Delay Time		---	27.3	---	ns
t _f	Fall Time		---	5.25	---	ns
Drain-Source Diode Characteristics						
I _S	Continuous Drain to Source Diode	V _D =V _G =0V	---	---	12	A
I _{SM}	Pulsed Drain to Source Diode	V _D =V _G =0V	---	---	38	A
V _{SD}	Source-Drain Diode Forward Voltage	V _{GS} =0V, I _S =10A	---	---	1.2	V
T _{rr}	Reverse Recovery Time	I _F =-10A	---	10	---	ns
Q _{rr}	Reverse Recovery Charge	di/dt=100A/us	---	6	---	nC

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
2. E_{AS} condition: Starting $T_J=25^\circ\text{C}$, $V_{DD}=20V$, $V_G=10V$, $R_G=25\Omega$, $L=0.5\text{mH}$, $I_{AS}=11A$
3. $R_{\theta JA}$ is measured with the device mounted on a 1inch² pad of 2oz copper FR4 PCB
4. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 0.5\%$.

TM4618A

N+P-Channel Enhancement Mode Mosfet

N-Typical Characteristics

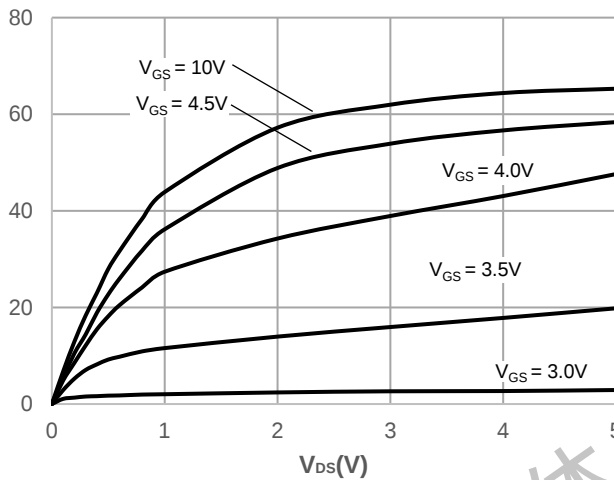


Figure 1: Output Characteristics

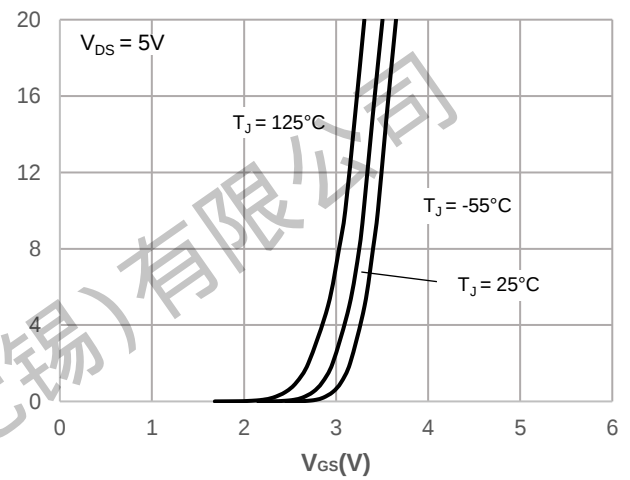


Figure 2: Typical Transfer Characteristics

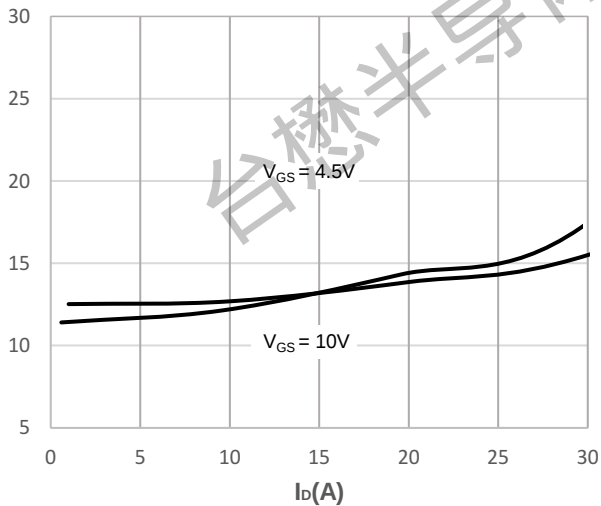


Figure 3: On-resistance vs. Drain Current

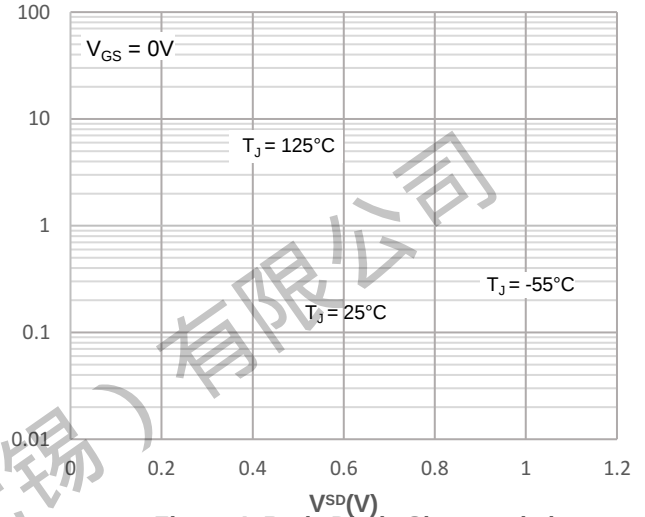


Figure 4: Body Diode Characteristics

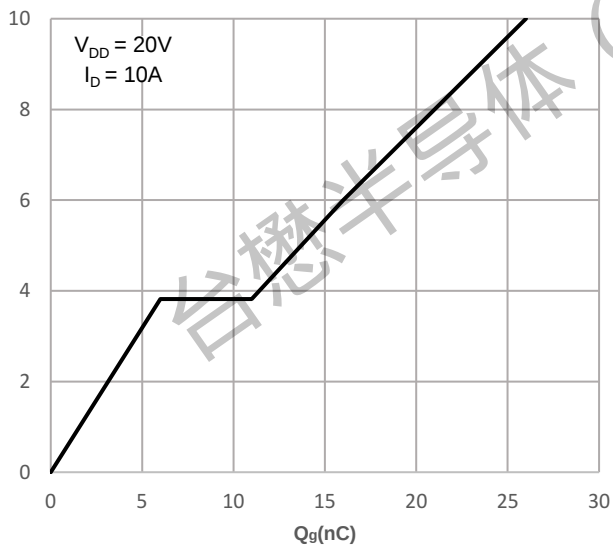


Figure 5: Gate Charge Characteristics

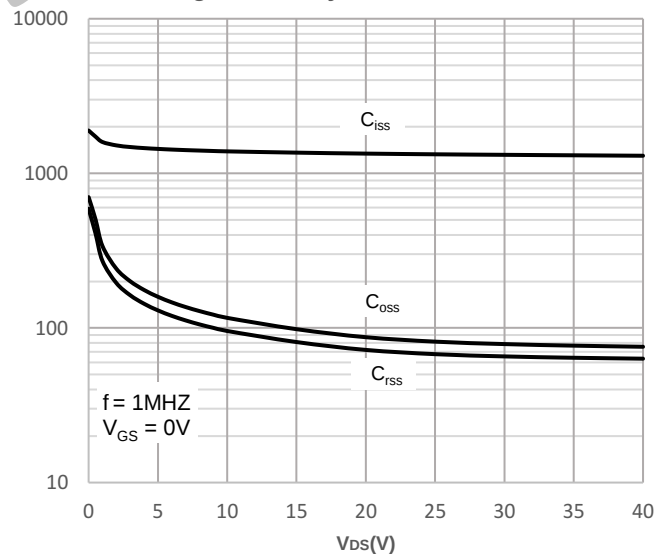


Figure 6: Capacitance Characteristics

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N+P-Channel Enhancement Mode Mosfet

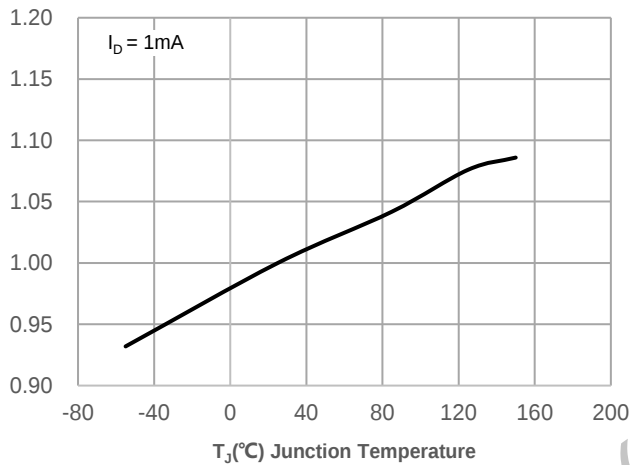


Figure 7: Normalized Breakdown voltage vs. Junction Temperature

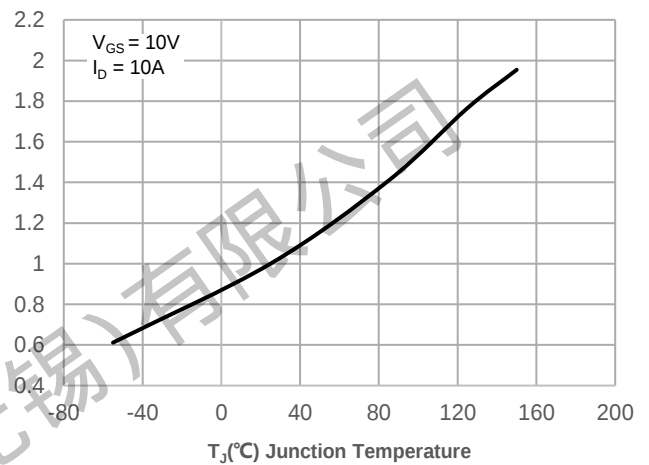


Figure 8: Normalized on Resistance vs. Junction Temperature

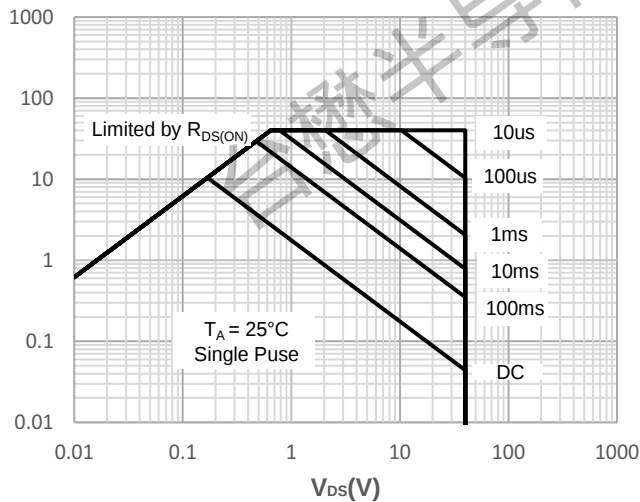


Figure 9: Maximum Safe Operating Area

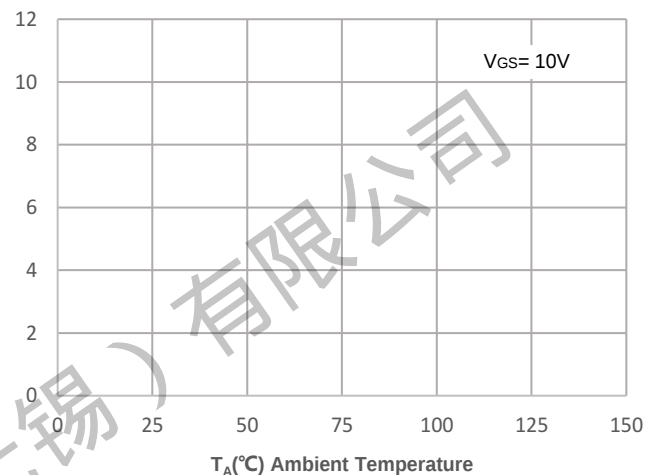


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

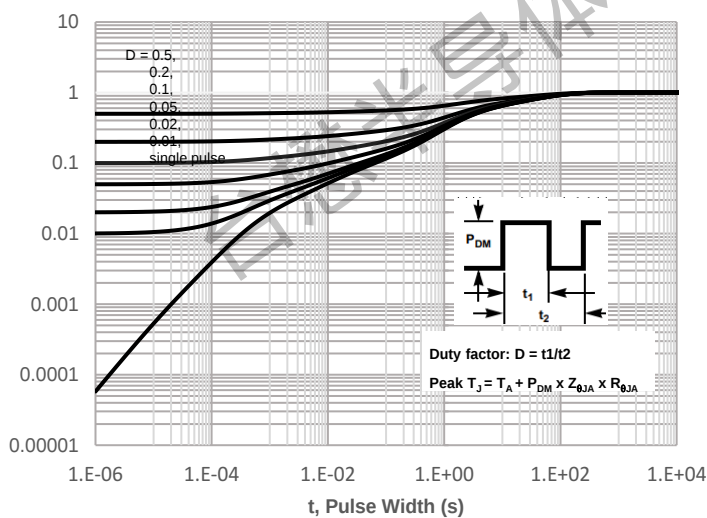


Figure 11: Normalized Maximum Transient Thermal Impedance

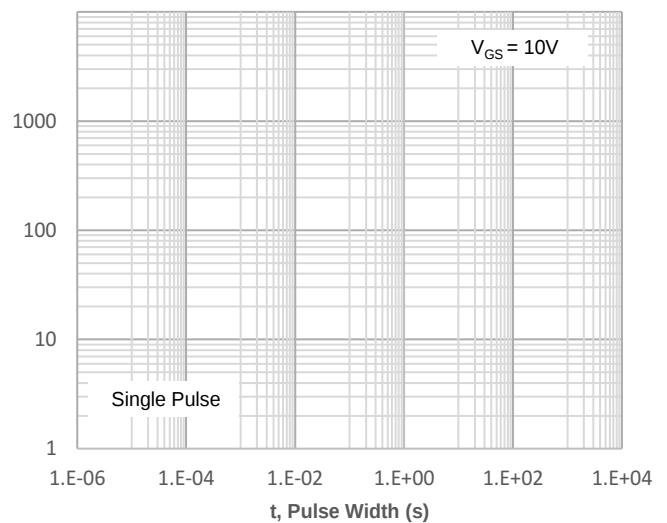


Figure 12: Peak Current Capacity

TM4618A
N+P-Channel Enhancement Mode Mosfet
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 μ A	-40	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{GS} =0V, V _{DS} =-40V	---	---	-1	μ A
I _{GSS}	Gate-Source Leakage Current	V _{GS} =± 20V, V _{DS} =0A	---	---	± 100	nA
On Characteristics ³						
V _{GS(th)}	Gate-Source Threshold Voltage ³	V _{GS} =V _{DS} , I _D =250 μ A	-1.0	-1.75	-2.5	V
R _{DS(ON)}	Drain-Source On Resistance ³	V _{GS} =-10V, I _D =-5A	---	14	18	m Ω
		V _{GS} =-4.5V, I _D =-5A	---	20	24	
Dynamic Characteristics						
C _{iss}	Input Capacitance ⁴	V _{DS} =-20V, V _{GS} =0V, f=1MHz	---	1290	---	pF
C _{oss}	Output Capacitance ⁴		---	185	---	
C _{rss}	Reverse Transfer Capacitance ⁴		---	140	---	
Switching Characteristics ⁴						
t _{d(on)}	Turn-On Delay Time ⁴	V _{DD} =-20V V _{GS} =-10V, R _{GEN} =3 Ω R _L =2 Ω	---	7	---	ns
t _r	Rise Time ⁴		---	6.6	---	ns
t _{d(off)}	Turn-Off Delay Time ⁴		---	22	---	ns
t _f	Fall Time ⁴		---	8	---	ns
Q _g	Total Gate Charge ⁴	V _{GS} =-10V, V _{DS} =-20V, I _D =-5A	---	18	---	nC
Q _{gs}	Gate-Source Charge ⁴		---	2.8	---	nC
Q _{gd}	Gate-Drain “Miller” Charge ⁴		---	5	---	nC
Drain-Source Diode Characteristics						
I _S	Continuous Drain to Source Diode ²	V _D =V _G =0V	---	---	-11	A
V _{SD}	Source-Drain Diode Forward Voltage ³	V _{GS} =0V, I _S =-6A	---	---	1.2	V

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, $t \leq 10$ sec.
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production

TM4618A

N+P-Channel Enhancement Mode Mosfet

P-Typical Characteristics

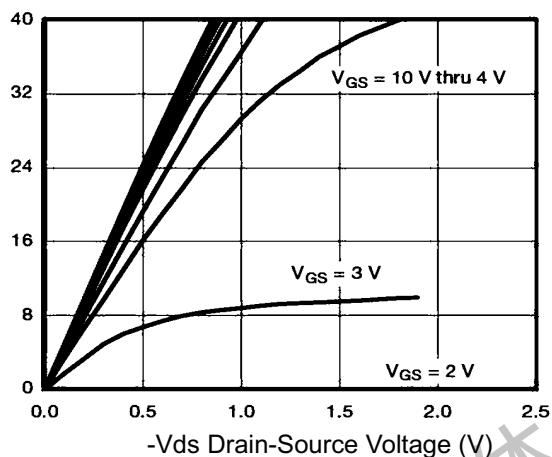


Figure 1 Output Characteristics

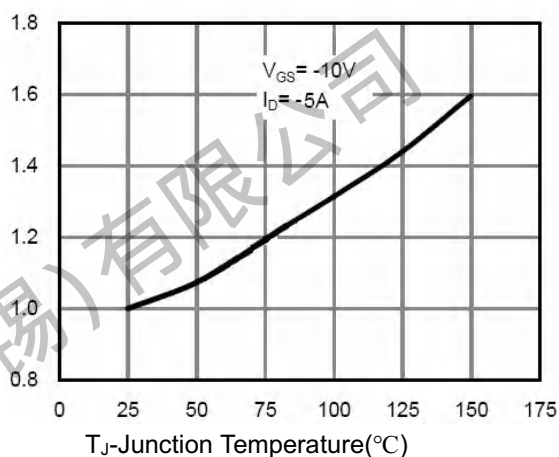


Figure 4 R_{DS(on)}-Junction Temperature

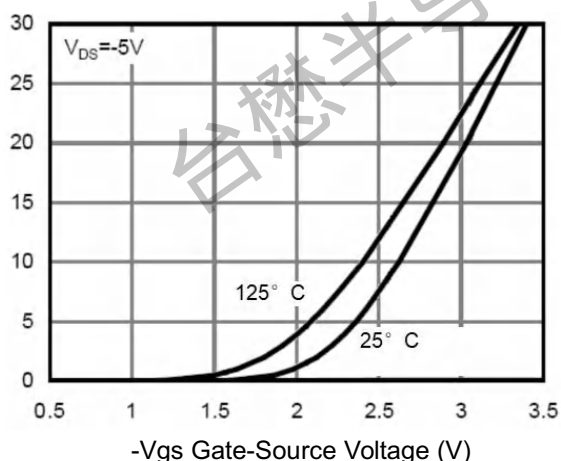


Figure 2 Transfer Characteristics

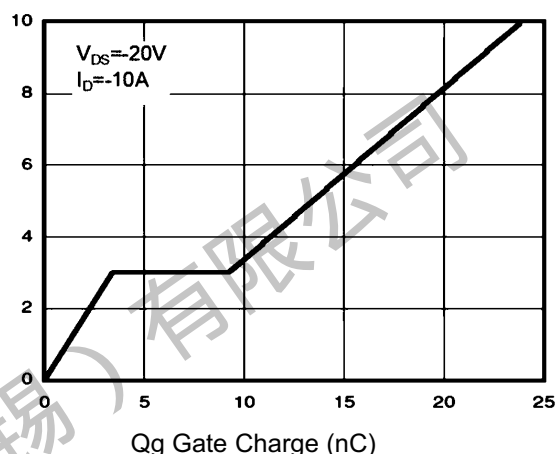


Figure 5 Gate Charge

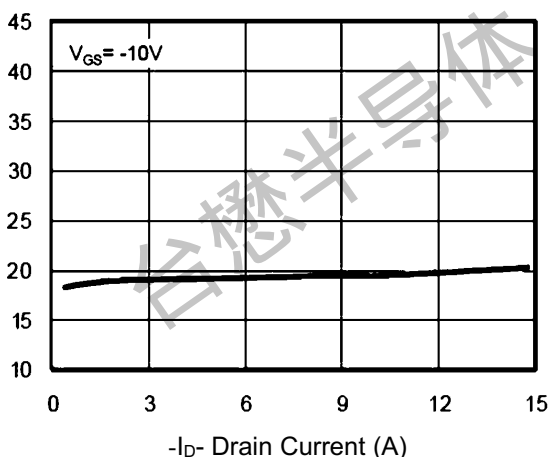


Figure 3 R_{DS(on)}- Drain Current

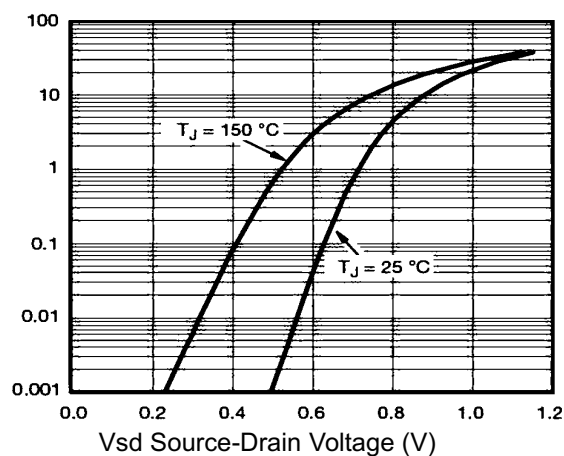


Figure 6 Source- Drain Diode Forward

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N+P-Channel Enhancement Mode Mosfet

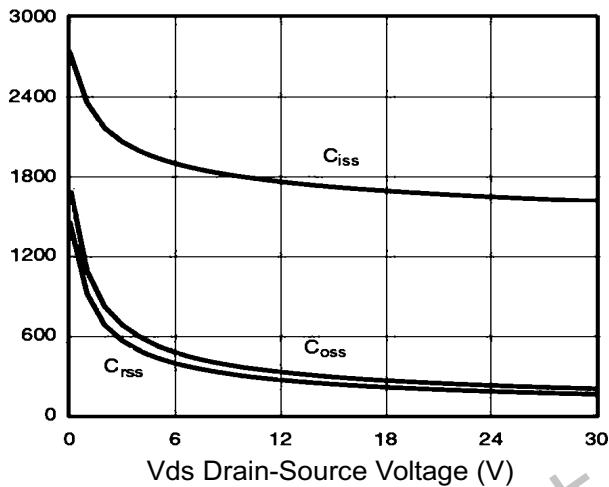


Figure 7 Capacitance vs V_{DS}

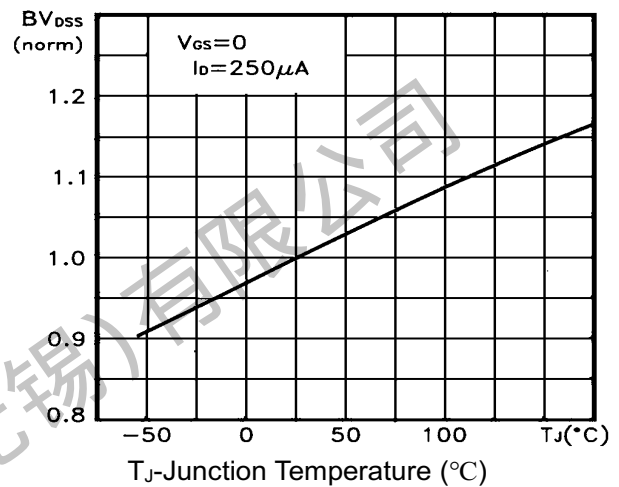


Figure 9 BV_{DSS} vs Junction Temperature

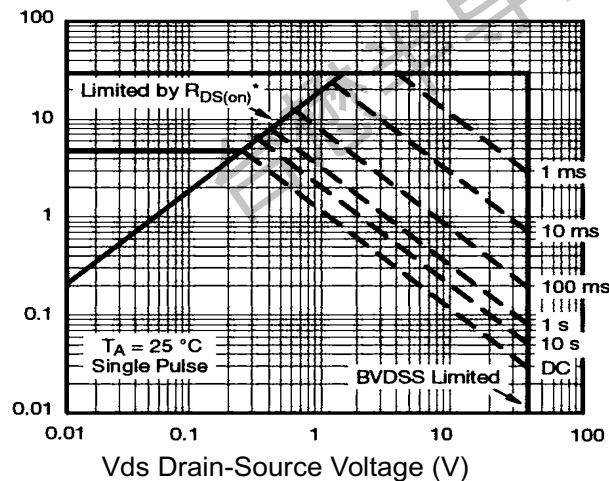


Figure 8 Safe Operation Area

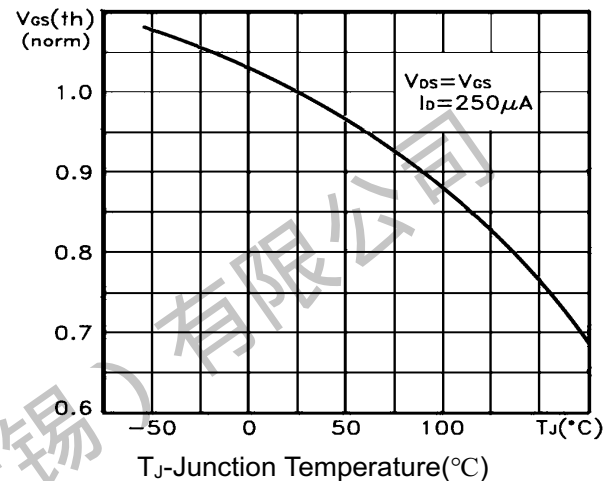


Figure 10 $V_{GS(th)}$ vs Junction Temperature

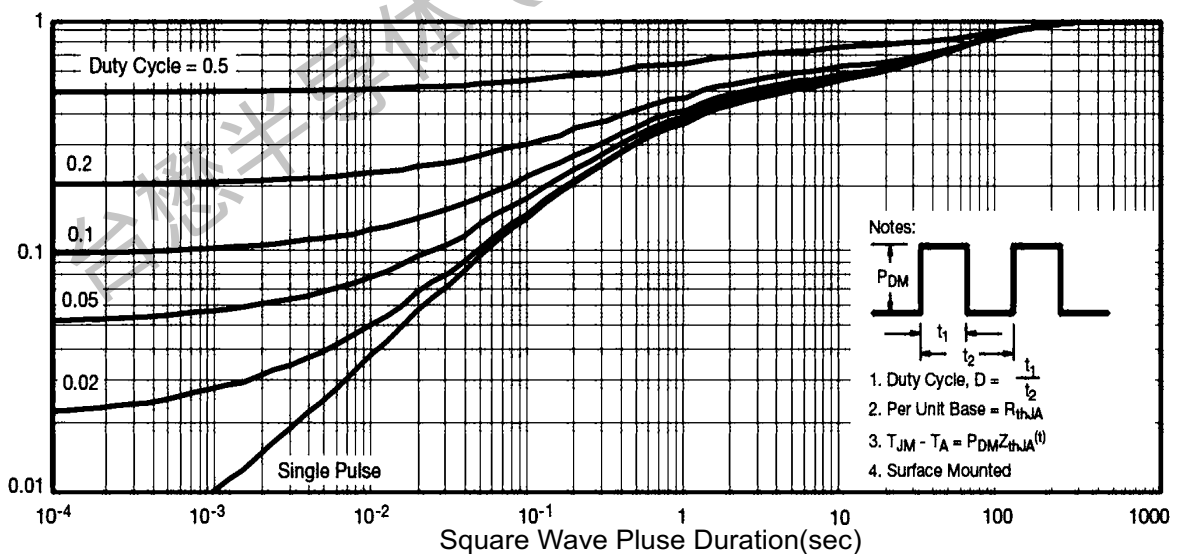
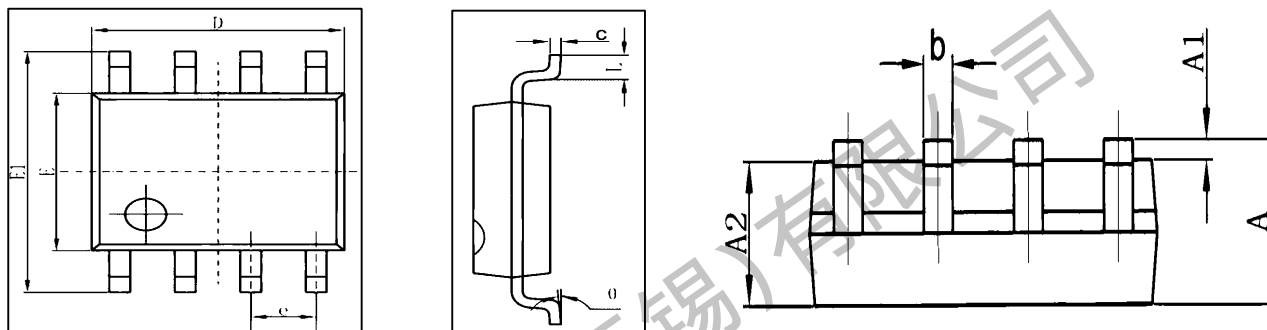


Figure 11 Normalized Maximum Transient Thermal Impedance

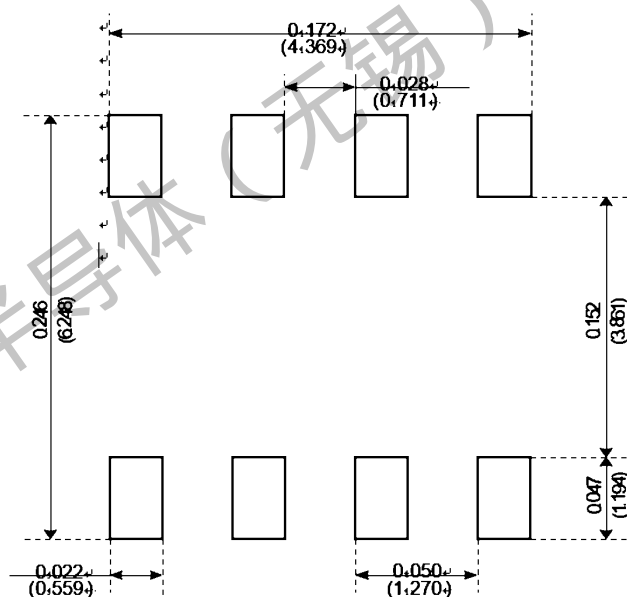
TM4618A

N+P-Channel Enhancement Mode Mosfet

Package Mechanical Data:SOP-8L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270 (BSC)		0.050 (BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

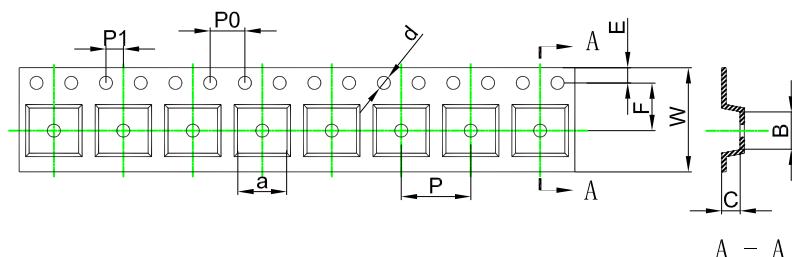


Recommended Minimum Pads

TM4618A

N+P-Channel Enhancement Mode Mosfet

SOP-8L Embossed Carrier Tape



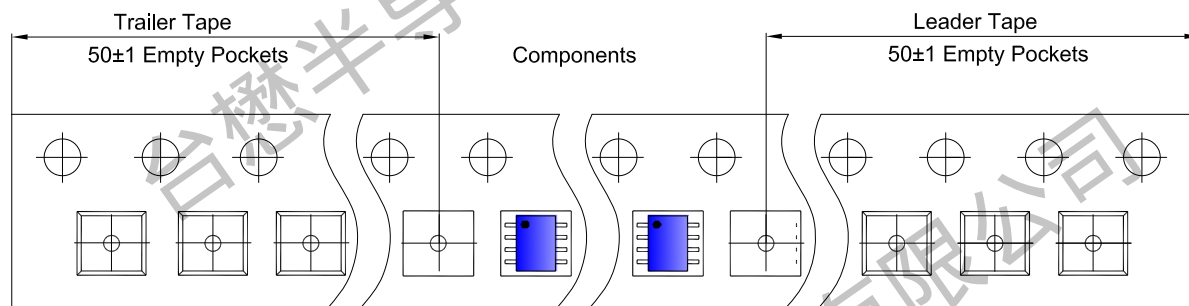
Packaging Description:

SOP-8L parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 2,500 units per 13" or 33cm diameter reel. The reels are clear in color and is made of polystyrene plastic (anti-static coated).

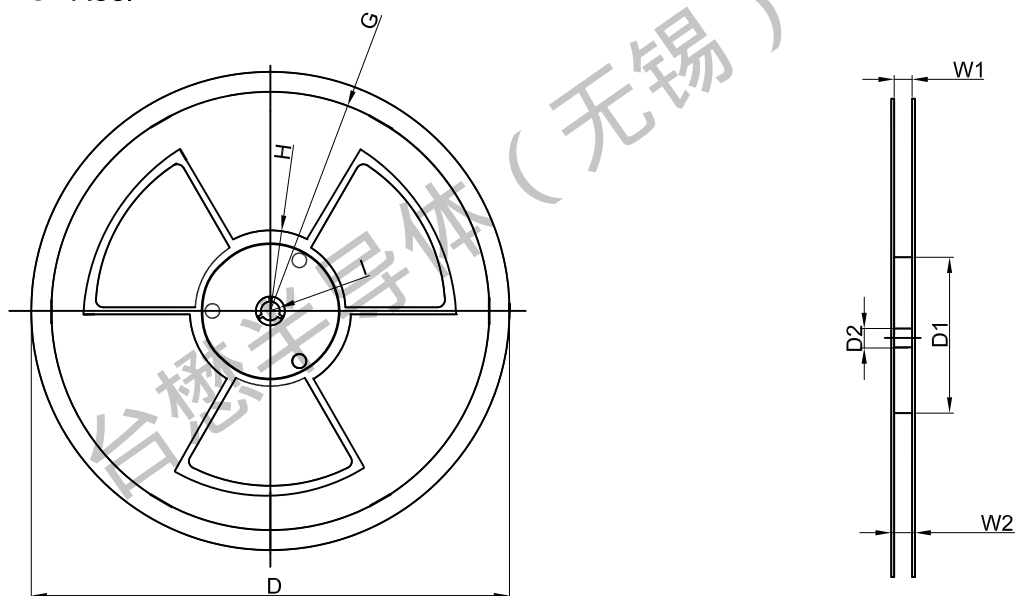
ALL DIM IN mm

Dimensions are in millimeter										
Pkg type	a	B	C	d	E	F	P0	P	P1	W
SOP-8L	6.40	5.40	2.10	Ø1.50	1.75	5.50	4.00	8.00	2.00	12.00

SOP-8L Tape Leader and Trailer



SOP-8L Reel



Dimensions are in millimeter								
Reel Option	D	D1	D2	G	H	I	W1	W2
13"Dia	Ø330.00	100.00	13.00	R135.00	R55.00	R6.50	12.00	14.00

REEL	Reel Size	Box	Box Size(mm)	Carton	Carton Size(mm)	G.W.(kg)
3,000 pcs	13 inch	6,000 pcs	370×355×52	48,000 pcs	400×360×368	

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Revision history:

Date	Rev	Description	Page
2023.11.04	23.11	Original	