TM04G03MI6

N+P-Channel Enhancement Mode Mosfet

General Description

- Low $R_{DS(ON)}$
- RoHS and Halogen-Free Compliant

Applications

- Load switch
- PWM

General Features

N Channl

V_{DS} =30V, I_D =5.6A

$R_{DS(ON)}$=26mΩ(Typ.) @ V_{GS}=10V

P Channl

V_{DS} = -30V,I_D = -3.9A

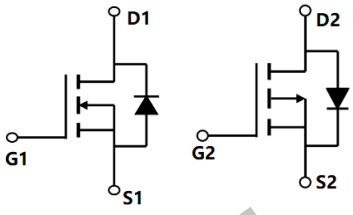
$R_{DS(ON)}$=52mΩ(Typ.) @ V_{GS}=-10V

100% UIS Tested

100% R_g Tested

Green Product

MI6:SOT-23-6L



Marking: 04G03

Absolute Maximum Ratings: (T_C=25℃ 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-TC=25℃	5.6	-3.9	A
	Continuous Drain Current-TC=100℃	3.6	-2.6	
I_{DM}	300μs Pulsed Drain Current	21	-15	A
P_D	Power Dissipation	1.4	1.4	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +175		℃

Thermal Characteristics:

Symbol	Parameter	Typ.	Max.	Units
$R_{\theta JA}$	Thermal Resistance Junction-Ambient	---	85	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case	---	50	℃/W

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N-Channel Electrical Characteristics (T_J=25 ℃, unless otherwise noted)

Symbol	Parameter	Test Conditions	N Channel			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_{DS}=250μA	30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=24V, V_{GS}=0V	-	-	1	μA
		T_J=85°C	-	-	30	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_{DS}=250μA	1.5	2.5	3.5	V
I_{GSS}	Gate Leakage Current	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
$R_{DS(ON)}$ [a]	Drain-Source On-State Resistance	V_{GS}=10V, I_{DS}=4.9A	-	26	35	mΩ
		V_{GS}=4.5V, I_{DS}=3A	-	38	58	
Diode Characteristics						
V_{SD} [a]	Diode Forward Voltage	I_{SD}=1A, V_{GS}=0V	-	0.75	1.1	V
t_{rr}	Reverse Recovery Time	I_{SD}=4.9A, dI_{SD}/dt=100A/μs	-	9.2	-	ns
Q_{rr}	Reverse Recovery Charge		-	4.3	-	nC
Dynamic Characteristics [b]						
R_g	Gate Resistance	V_{GS}=0V,V_{DS}=0V,F=1MHz	-	2.3	-	Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=15V, Frequency=1.0MHz	-	215	-	pF
C_{oss}	Output Capacitance		-	37	-	
C_{rss}	Reverse Transfer Capacitance		-	28	-	
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=15V, R_L=15Ω, I_{DS}=1A, V_{GEN}=10V, R_G=6Ω	-	5.3	8	ns
T_r	Turn-on Rise Time		-	11	16	
$t_{d(OFF)}$	Turn-off Delay Time		-	12	17	
T_f	Turn-off Fall Time		-	2.6	4	
Gate Charge Characteristics [b]						
Q_g	Total Gate Charge	V_{DS}=15V, I_{DS}=4.9A, V_{GS}=4.5V	-	3	-	nC
		V_{DS}=15V, I_{DS}=4.9A, V_{GS}=10V	-	5.8	-	
Q_{gs}	Gate-Source Charge	V_{DS}=15V, V_{GS}=10V, I_{DS}=4.9A	-	1.1	-	
Q_{gd}	Gate-Drain Charge		-	1.5	-	
Q_{gth}	Threshold Gate Charge		-	0.5	-	

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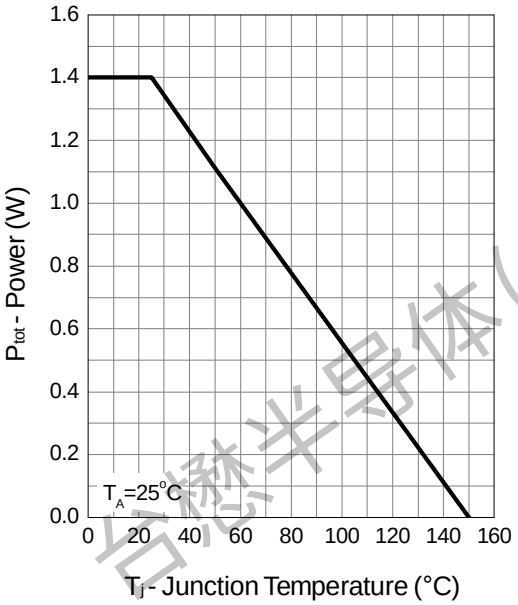
P-Channel Electrical Characteristics (T_J=25 ℃, unless otherwise noted)

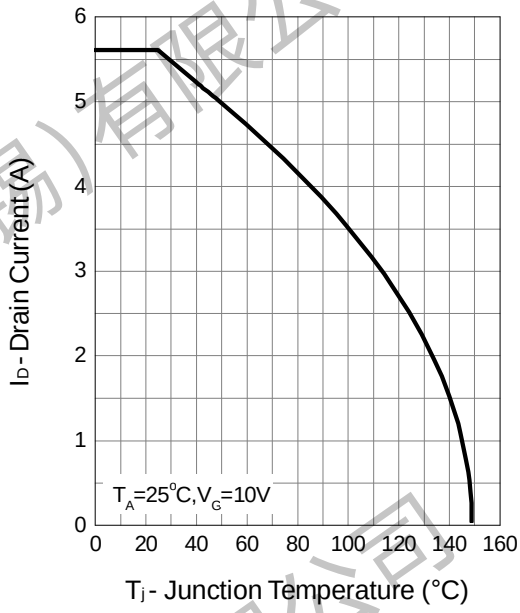
Symbol	Parameter	Test Conditions	P Channel			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_{DS}=-250μA	-30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=-24V, V_{GS}=0V	-	-	-1	μA
		T_J=85°C	-	-	-30	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_{DS}=-250μA	-1.5	-2.5	-3.5	V
I_{GSS}	Gate Leakage Current	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
$R_{DS(ON)}$ [a]	Drain-Source On-State Resistance	V_{GS}=-10V, I_{DS}=-3A	-	52	62	mΩ
		V_{GS}=-4.5V, I_{DS}=-1.9A	-	65	88	
Diode Characteristics						
V_{SD} [a]	Diode Forward Voltage	I_{SD}=-1A, V_{GS}=0V	-	-0.75	-1.1	V
t_{rr}	Reverse Recovery Time	I_{SD}=-3A, dI_{SD}/dt=100A/μs	-	19	-	ns
Q_{rr}	Reverse Recovery Charge		-	14	-	nC
Dynamic Characteristics [b]						
R_g	Gate Resistance	V_{GS}=0V,V_{DS}=0V,F=1MHz	-	7	-	Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=-15V, Frequency=1.0MHz	-	229	-	pF
C_{oss}	Output Capacitance		-	42	-	
C_{rss}	Reverse Transfer Capacitance		-	33	-	
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=-15V, R_L=15Ω, I_{DS}=-1A, V_{GEN}=-10V, R_G=6Ω	-	7.2	-	ns
T_r	Turn-on Rise Time		-	9.3	-	
$t_{d(OFF)}$	Turn-off Delay Time		-	15.4	-	
T_f	Turn-off Fall Time		-	3.6	-	
Gate Charge Characteristics [b]						
Q_g	Total Gate Charge	V_{DS}=-15V, I_{DS}=-3A, V_{GS}=-4.5V	-	3.3	-	nC
		V_{DS}=-15V, I_{DS}=-3A, V_{GS}=-10V	-	6.5	-	
Q_{gs}	Gate-Source Charge	V_{DS}=-15V, V_{GS}=-10V, I_{DS}=-3A	-	1.1	-	
Q_{gd}	Gate-Drain Charge		-	1.1	-	
Q_{gth}	Threshold Gate Charge		-	0.6	-	

N-Channel Typical Characteristics

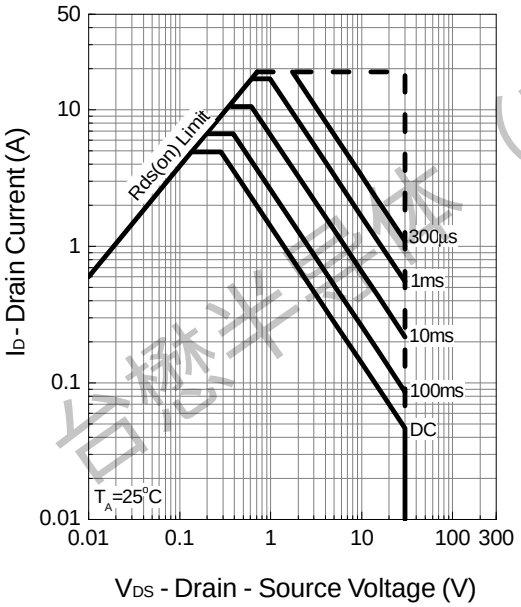
Power Dissipation



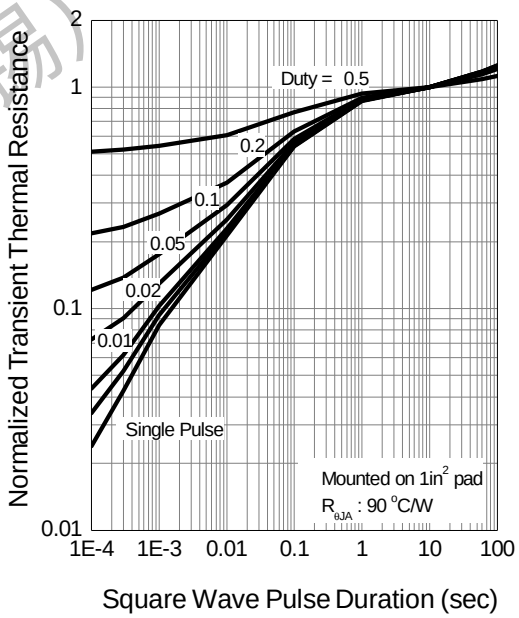
Drain Current



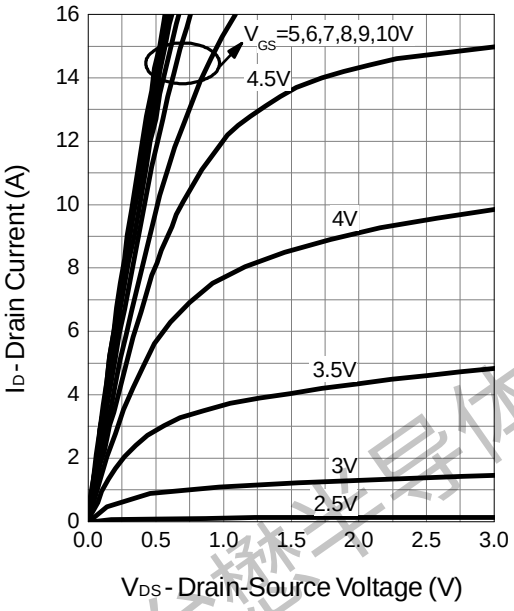
Safe Operation Area



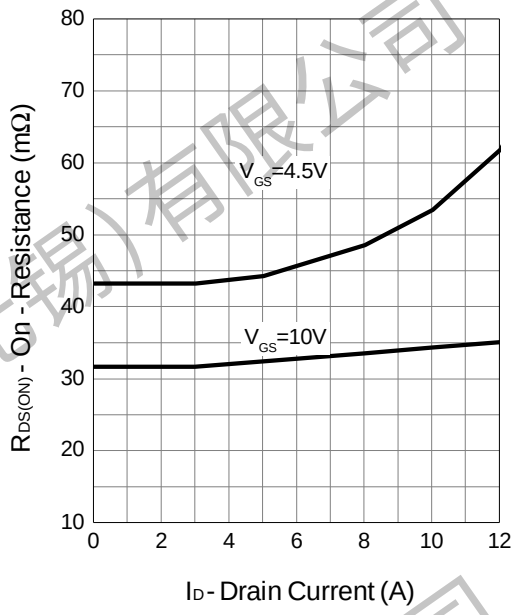
Thermal Transient Impedance



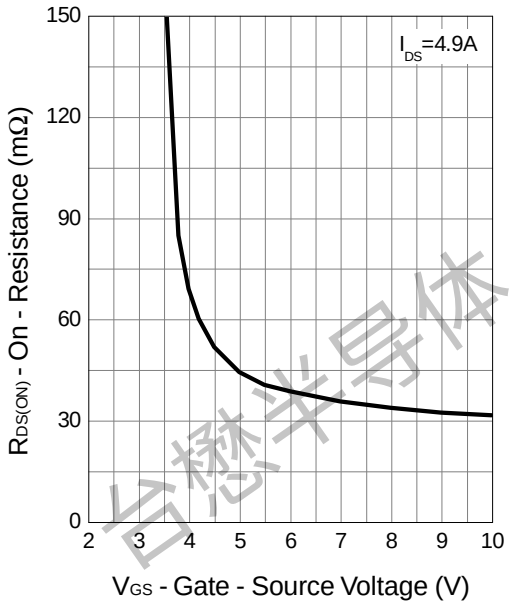
Output Characteristics



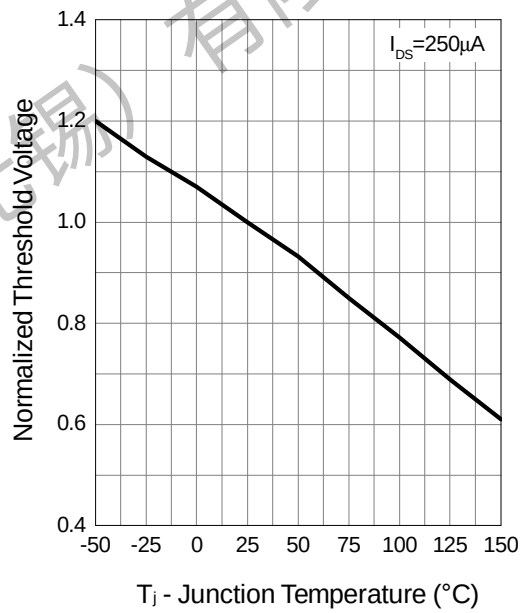
Drain-Source On Resistance



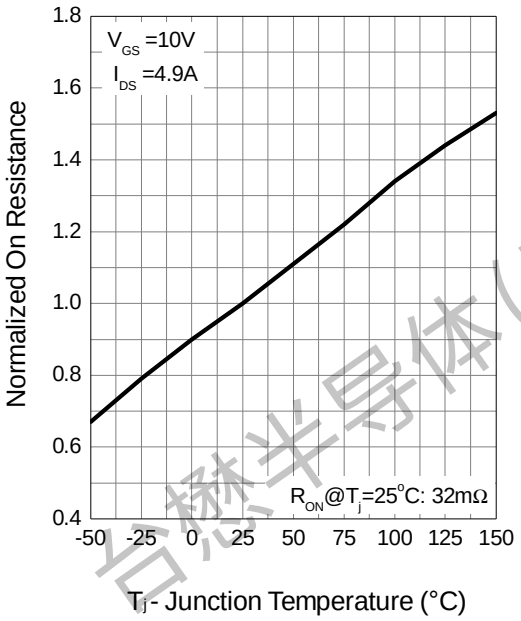
Gate-Source On Resistance



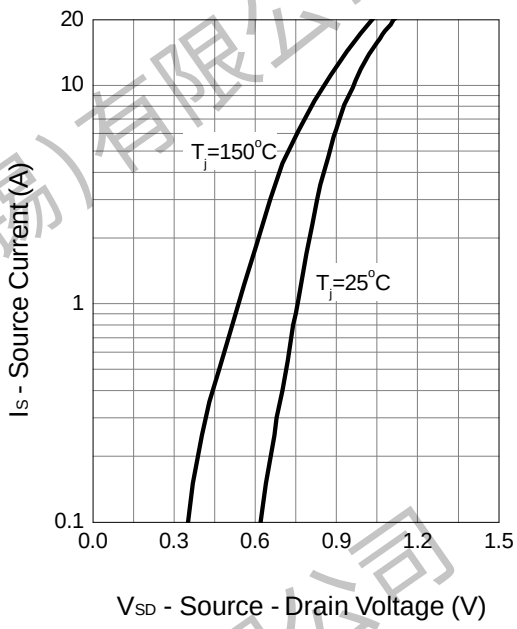
Gate Threshold Voltage



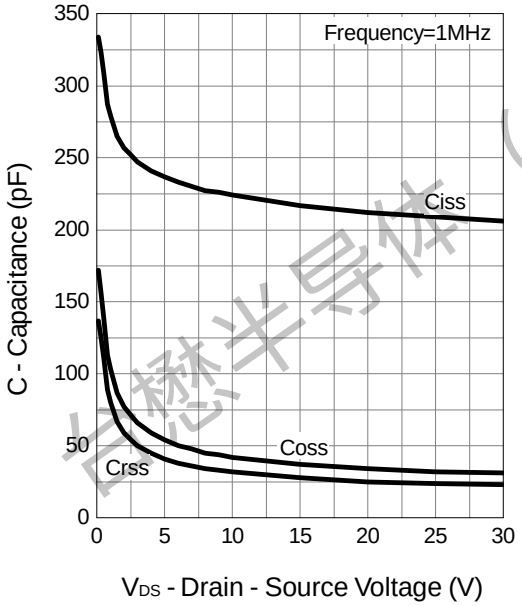
Drain-Source On Resistance



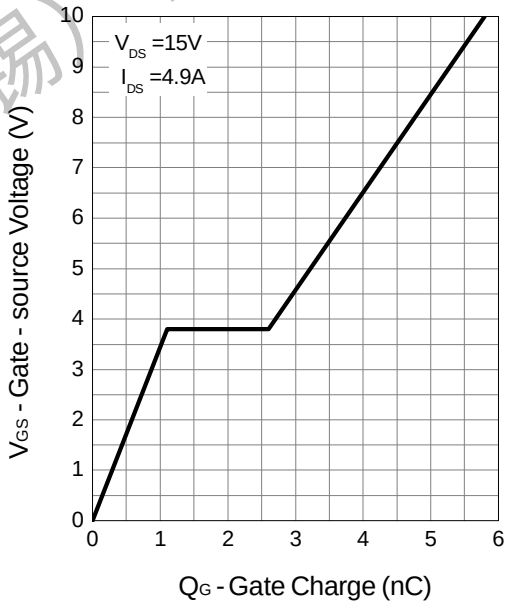
Source-Drain Diode Forward



Capacitance



Gate Charge



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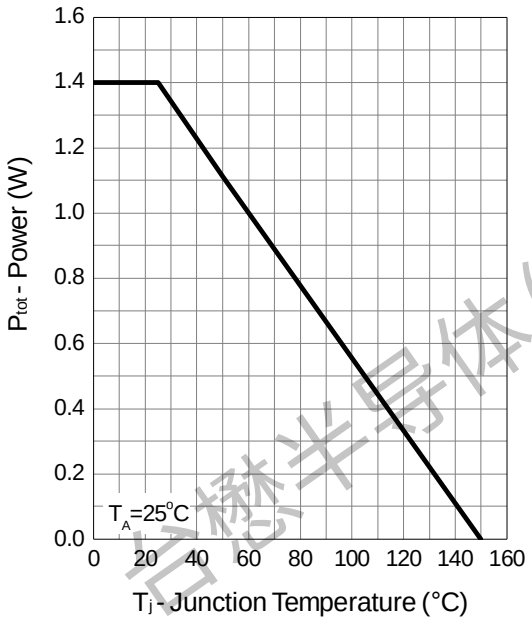
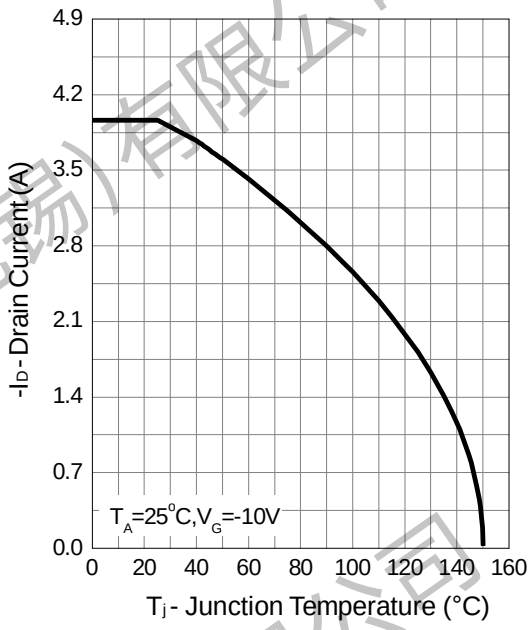
P-Typical Characteristics

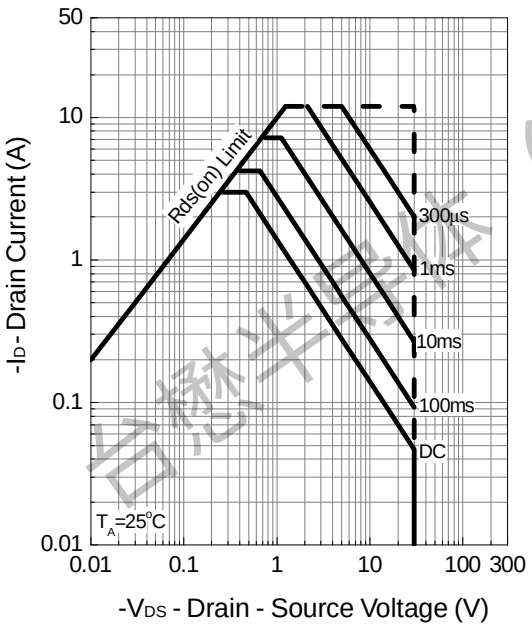
Power Dissipation



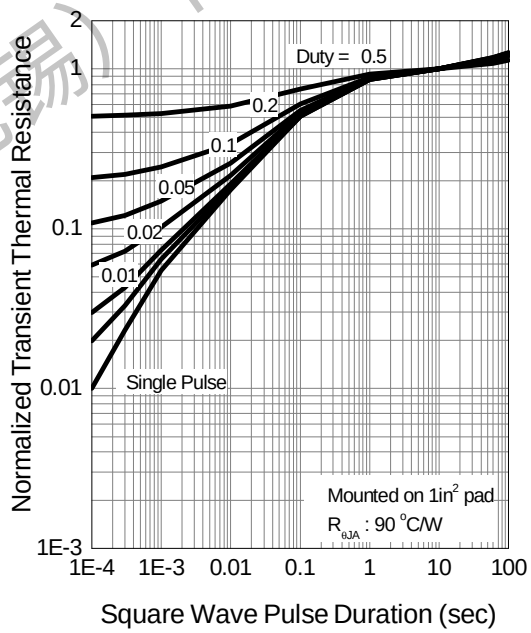
Drain Current



Safe Operation Area



Thermal Transient Impedance



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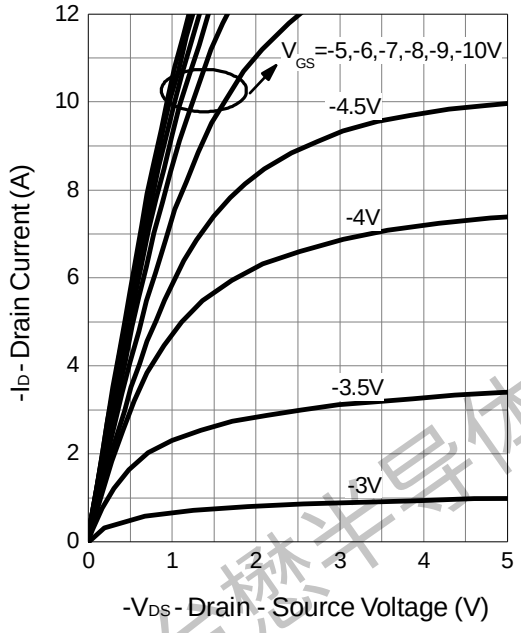
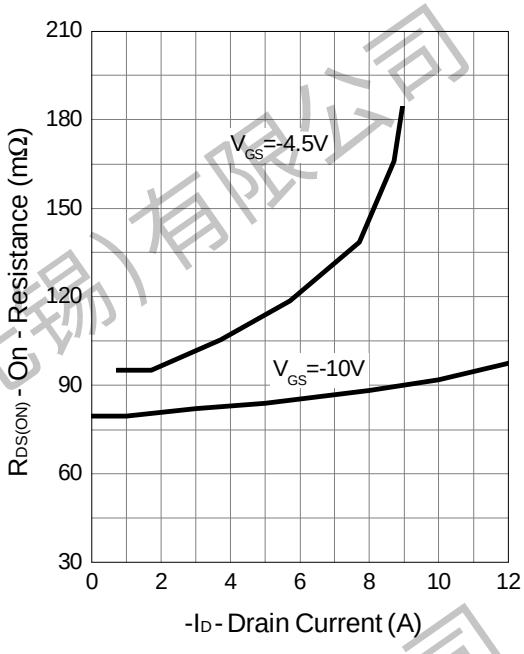
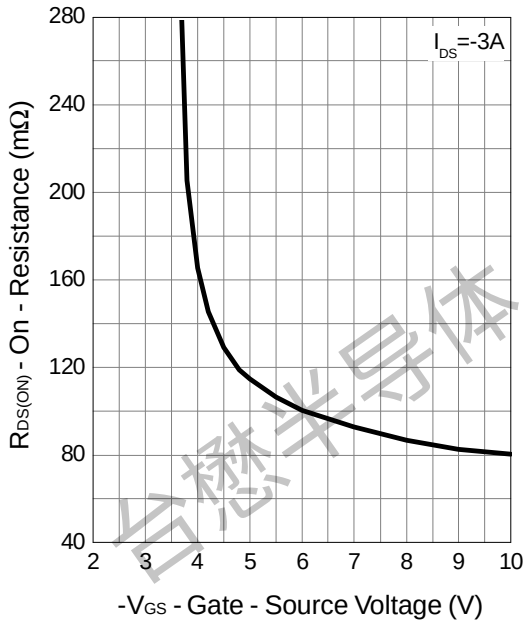
Output Characteristics



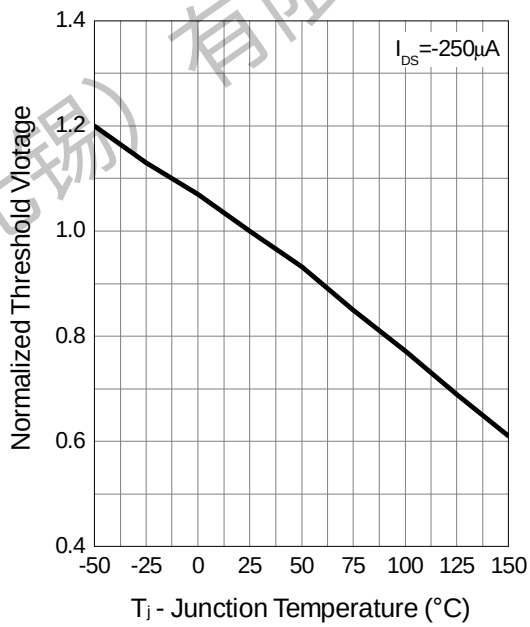
Drain-Source On Resistance



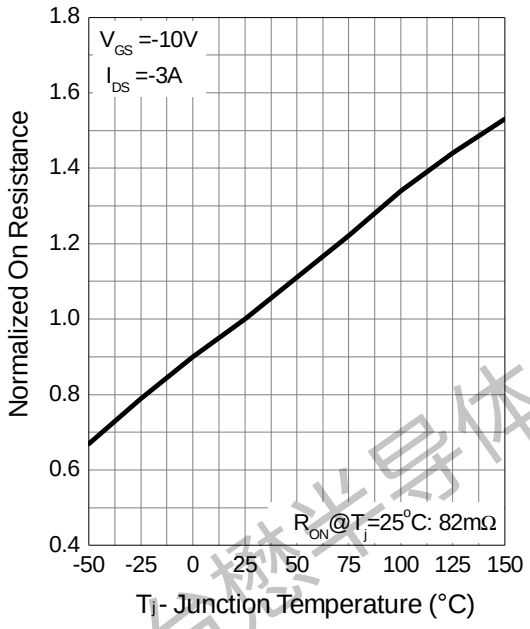
Gate-Source On Resistance



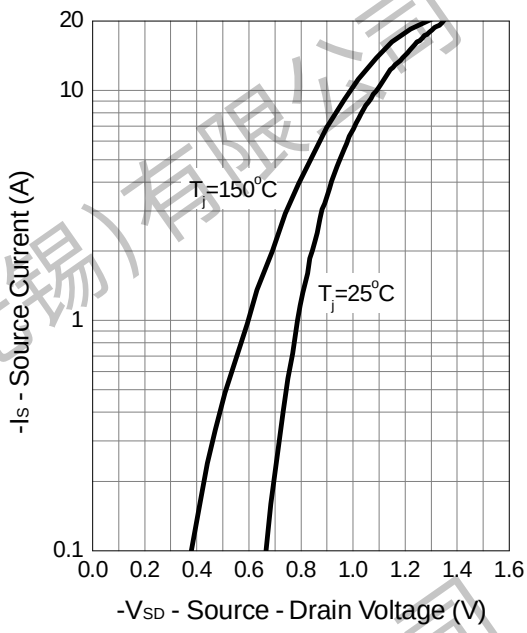
Gate Threshold Voltage



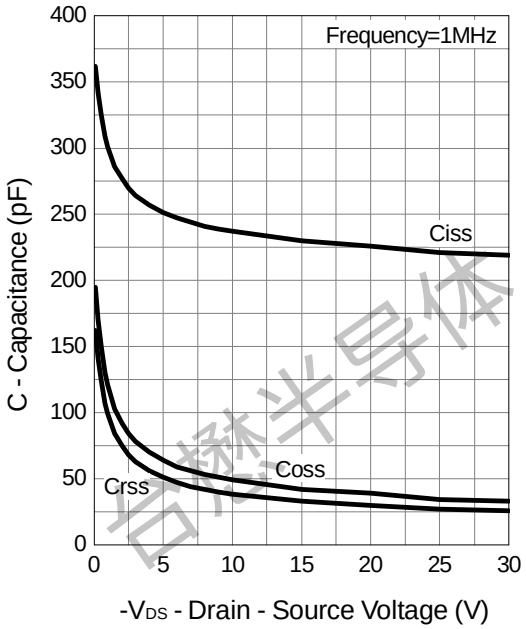
Drain-Source On Resistance



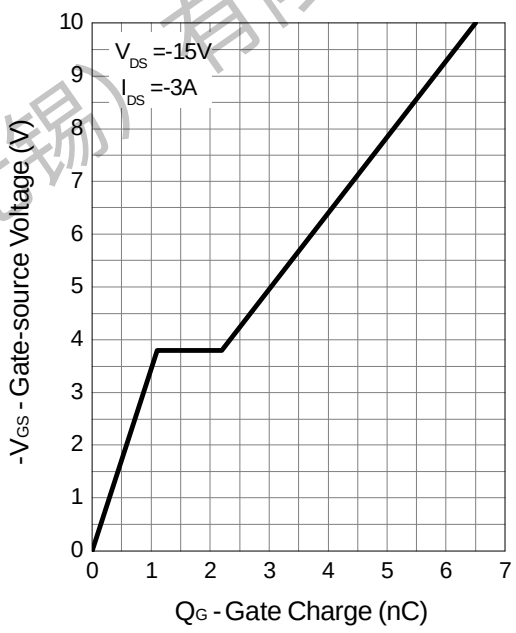
Source-Drain Diode Forward



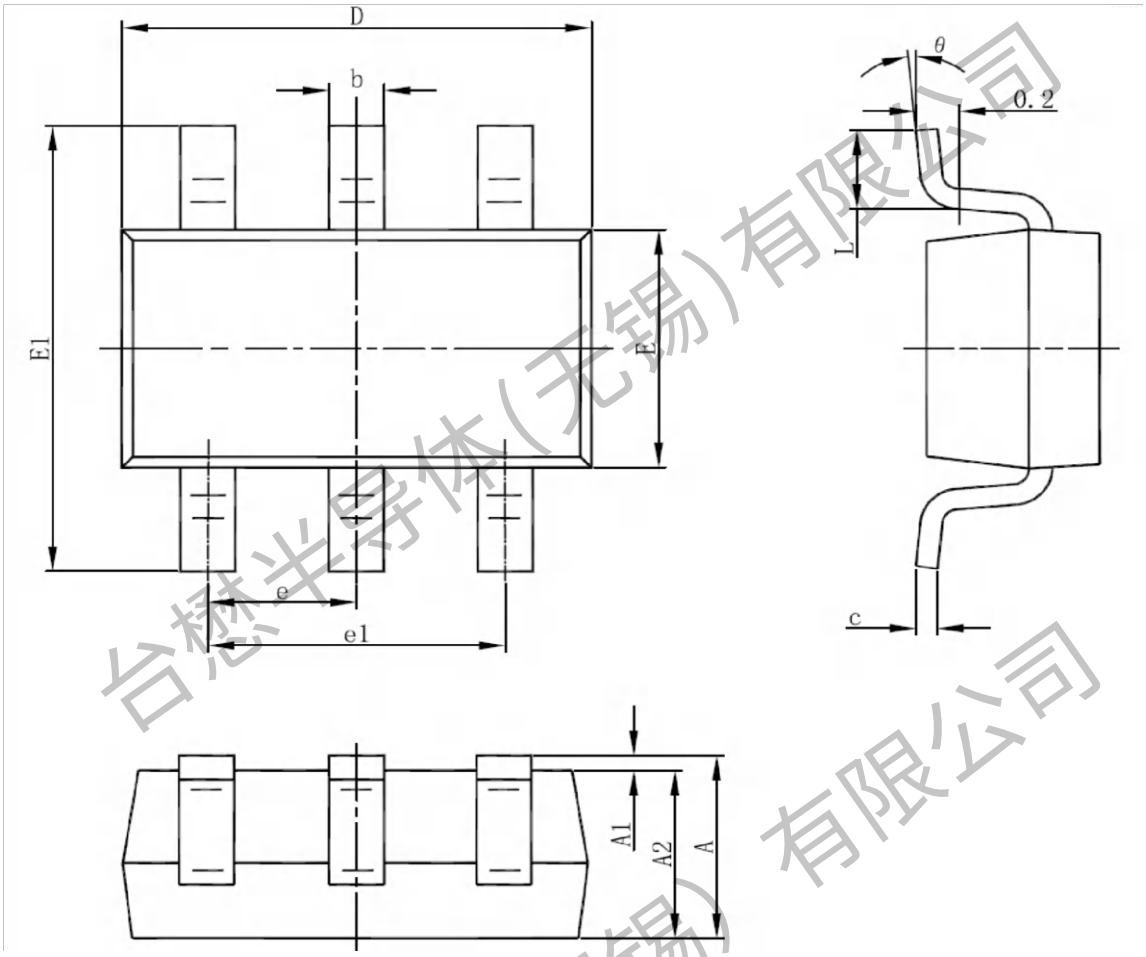
Capacitance



Gate Charge

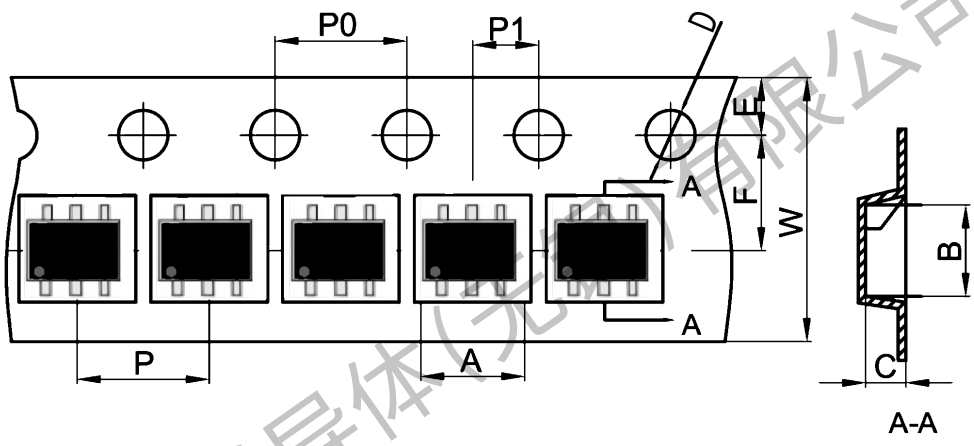


Package Mechanical Data:SOT-23-6L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

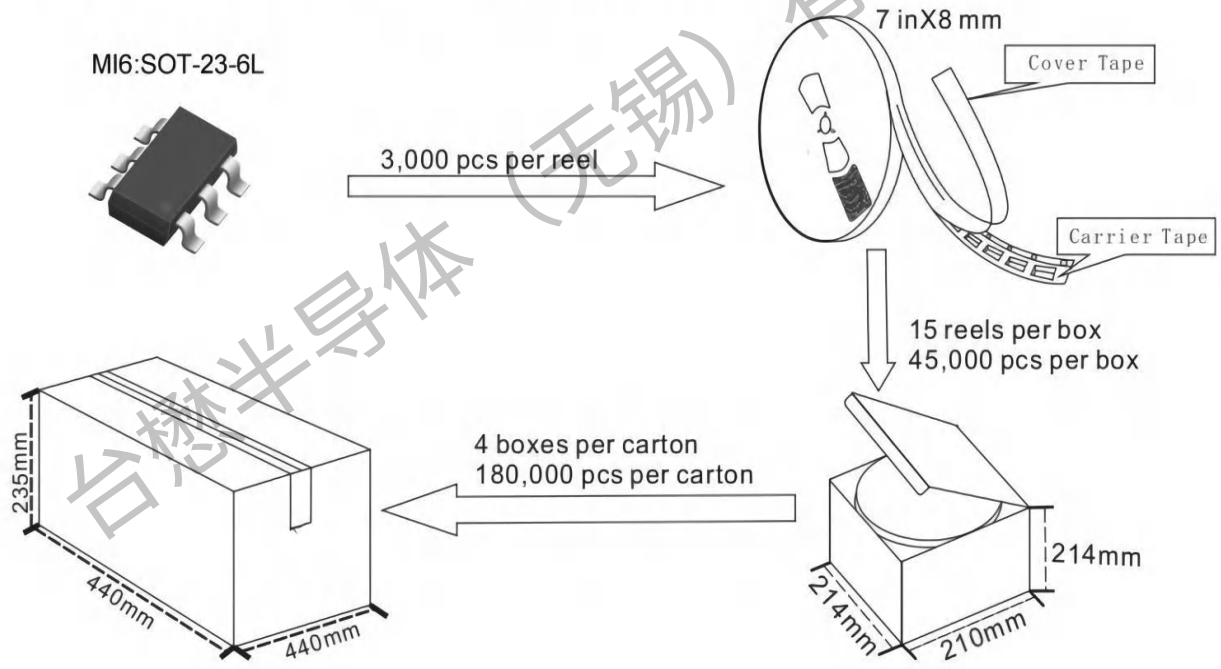
SOT-23-6L Embossed Carrier Tape



Dimensions are in millimeter										
Pkg type	A	B	C	D	E	F	P0	P	P1	W
SOT-23-6L	3.15	2.77	1.22	Ø1.50	1.75	3.50	4.00	4.00	2.00	8.00

SOT-23-6L Packing

The method of packaging and dimension are shown as below figure. (Dimension in mm)



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Revision history:

Date	Rev	Description	Page
2023.06.22	23.06	Original	