TM01G02MI6

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} = 20V,I_D =1.1A

$R_{DS(ON)}$= 500mΩ(typ.) @ V_{GS}=4.5V

P Channel

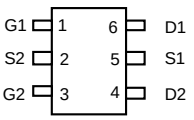
V_{DS} = -20V,I_D = -0.8A

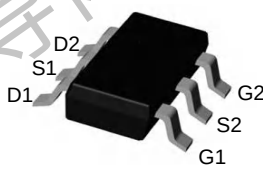
$R_{DS(ON)}$=1000mΩ(typ.)@ V_{GS}=-4.5V

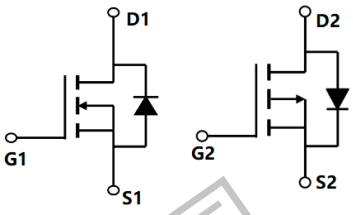
100% UIS Tested

100% R_g Tested

MI6:SOT-23-6L







Marking: 2520

Absolute Maximum Ratings: (T_C=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- Tj=150℃	1.1	-0.8	A
	Continuous Drain Current-TC=100℃	5	-4	
P_D	Power Dissipation	0.8	0.8	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +175		℃

Thermal Characteristics:

Symbol	Parameter	N-CH	P-CH	Units
$R_{\theta JA}$	Thermal Resistance,Junction to Ambient	156	156	℃/W

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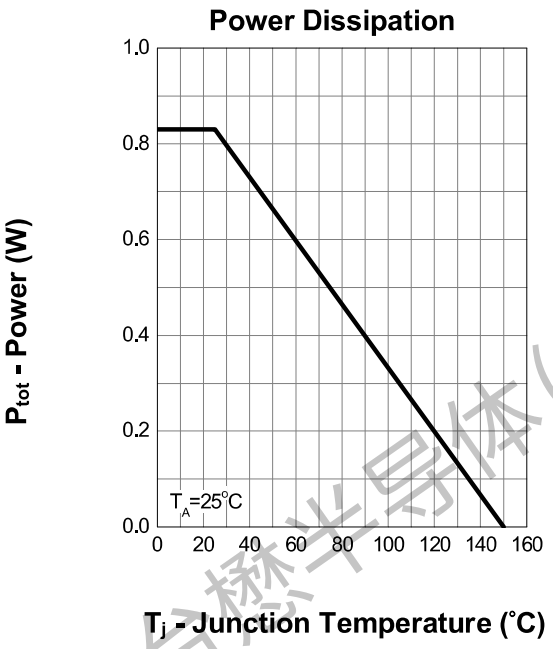
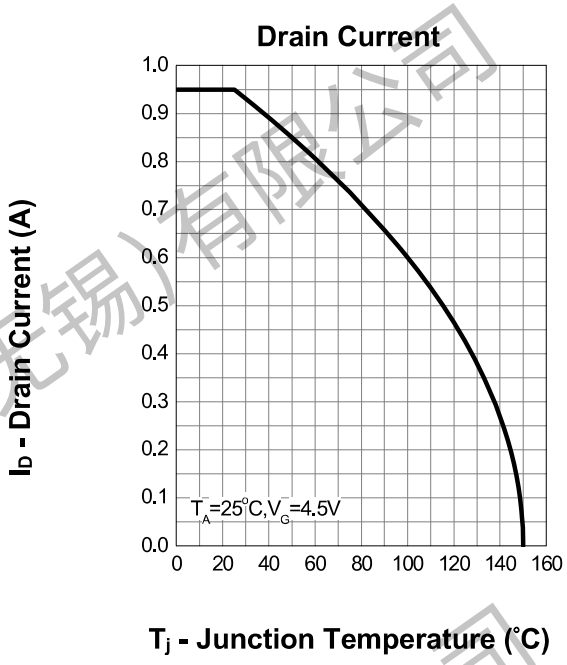
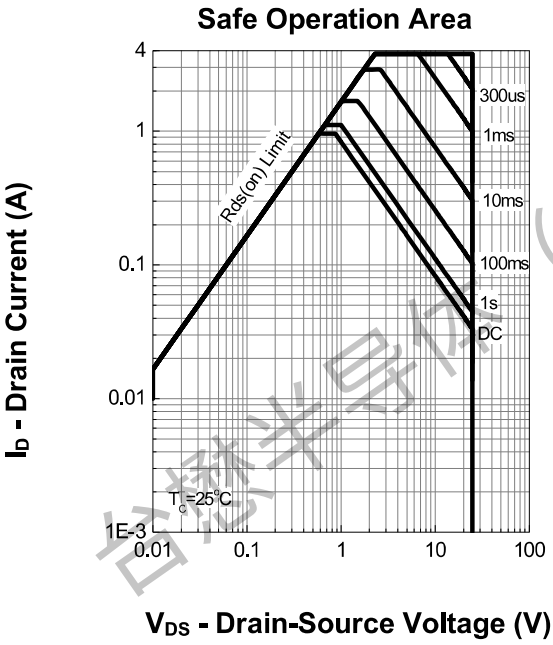
N-Channel Electrical Characteristics: (T_C=25℃ unless otherwise noted)

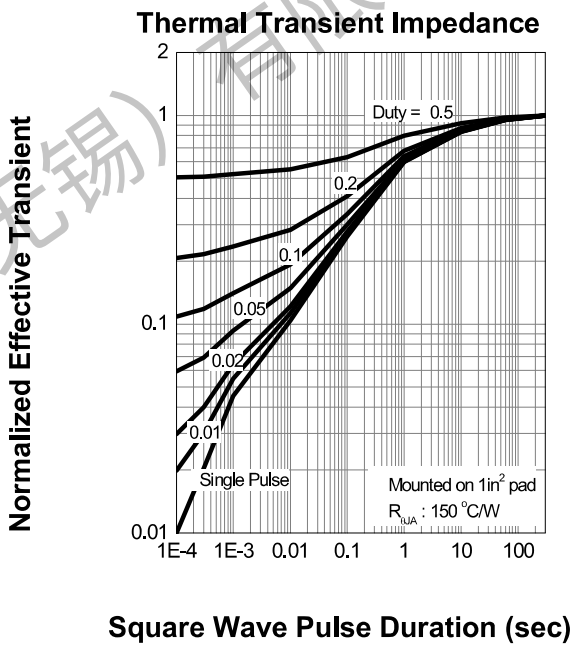
Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Sourtce Breakdown Voltage	V_{GS}=0V,I_D=250μA	20	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{GS}=0V, V_{DS}=25V	---	---	1	μA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±10V, V_{DS}=0A	---	---	±10	μA
On Characteristics[3]						
$V_{GS(th)}$	GATE-Source Threshold Voltage[1]	V_{GS}=V_{DS}, I_D=250μA	0.4	0.75	1.0	V
$R_{DS(ON)}$	Drain-Source On Resistance[1]	V_{GS}=4.5V,I_D=0.5A	---	500	550	mΩ
		V_{GS}=2.5V,I_D=0.2A	---	550	700	
Dynamic Characteristics[4]						
C_{iss}	Input Capacitance	V_{DS}=10V, V_{GS}=0V, f=1MHz	---	30	---	pF
C_{oss}	Output Capacitance		---	3	---	
C_{rss}	Reverse Transfer Capacitance		---	1	---	
Qg	Gate Charge	V_{GS} = 4.5 V, V_{DS} = 10 V, I_{DS} = 0.95 A		0.6	---	nc
Qgs	Gate-Source Charge			0.26	---	
Qgd	Gate-Drain Charge			0.17	---	
Switching Characteristics[4]						
$t_{d(on)}$	Turn-On Delay Time	V_{DS} = 30 V, V_{GEN} = 10 V, R_G = 25 Ω, R_L = 60 Ω, I_{DS} = 0.95 A	---	3.6	---	ns
t_r	Rise Time		---	3.3	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	20	---	ns
t_f	Fall Time		---	11	---	ns
Drain-Source Diode Characteristics						
V_{SD}	Source-Drain Diode Forward Voltage[1]	V_{GS}=0V,I_S=0.5A	---	---	1.3	V

N-Typical Characteristics

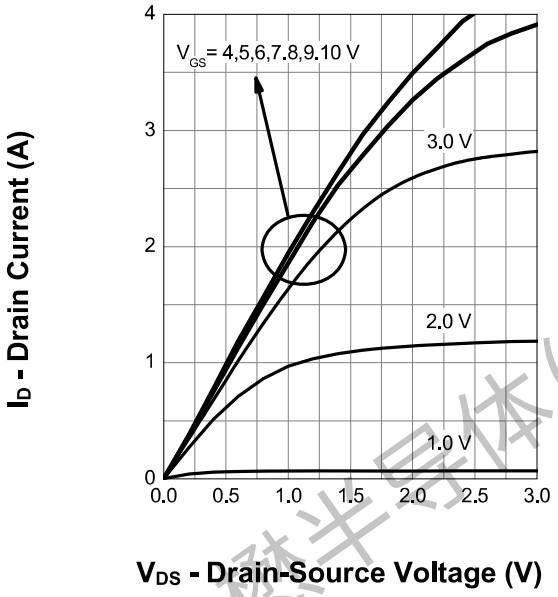




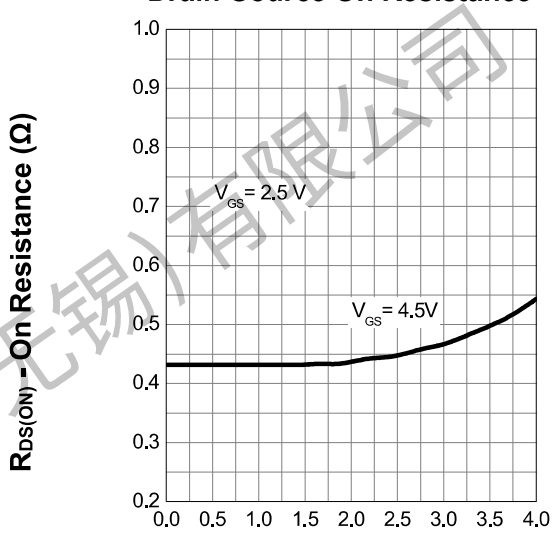




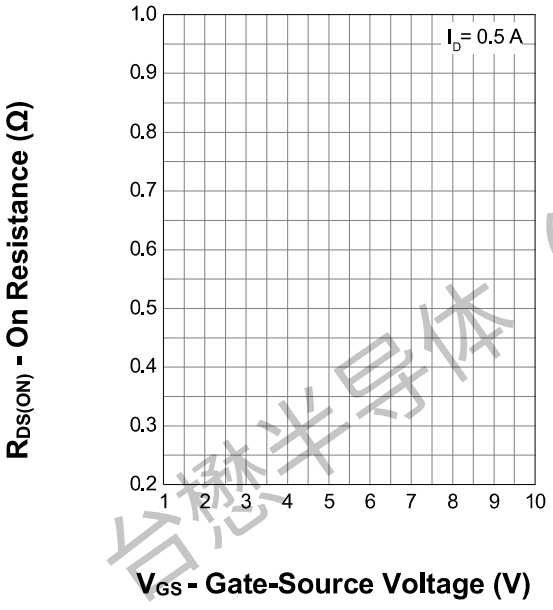
Output Characteristics



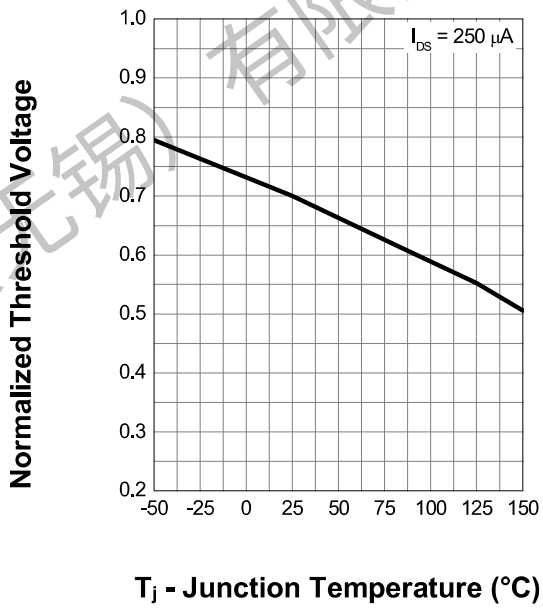
Drain-Source On Resistance



Transfer Characteristics



Gate Threshold Voltage



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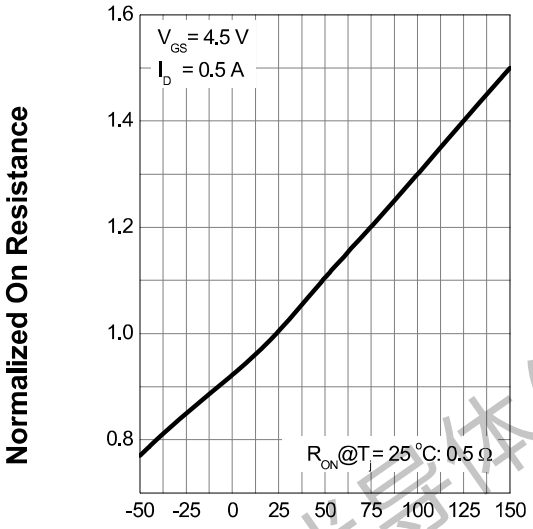
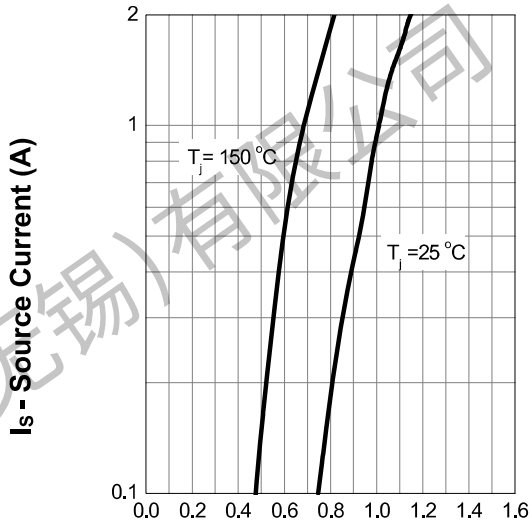
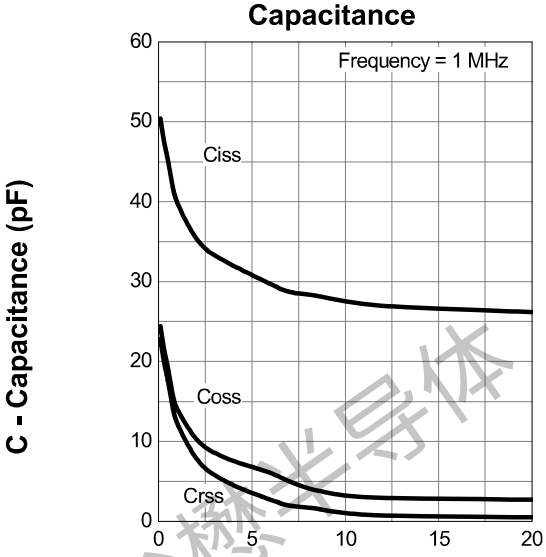
Drain-Source On Resistance



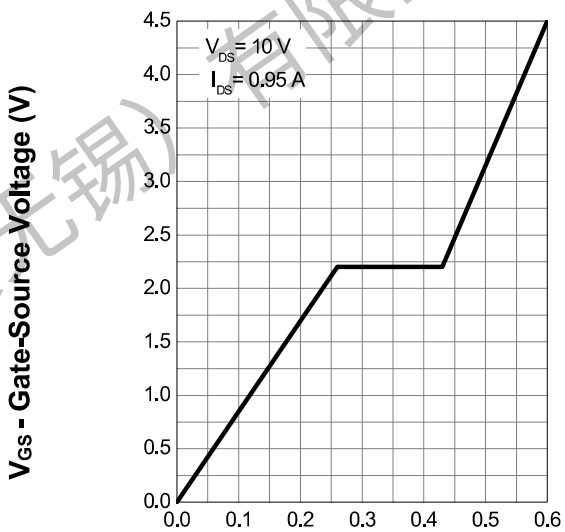
Source-Drain Diode Forward



Capacitance



Gate Charge

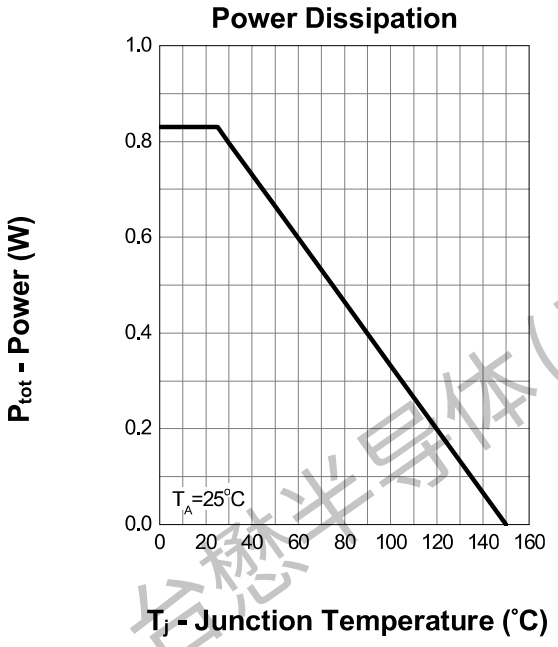


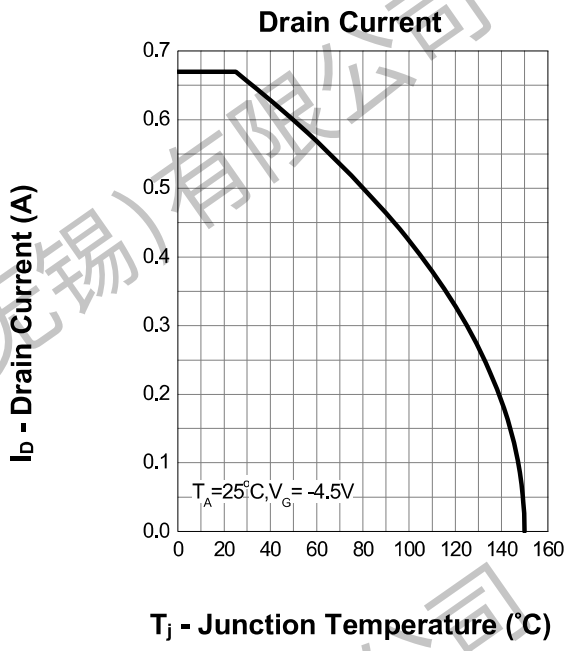
P-Channel Electrical Characteristics: (T_C=25℃ unless otherwise noted)

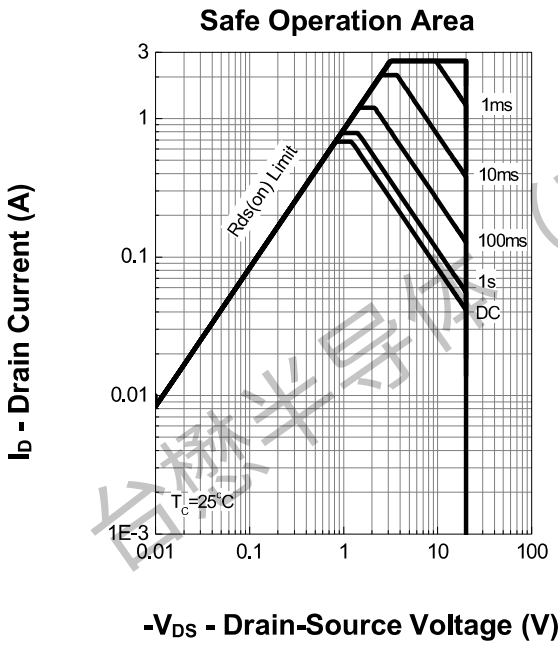
Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Sourtce Breakdown Voltage	V_{GS}=0V,I_D=250μA	-20	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{GS}=0V, V_{DS}=-30V	---	---	1	μA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±8V, V_{DS}=0A	---	---	±10	μA
On Characteristics[3]						
$V_{GS(th)}$	GATE-Source Threshold Voltage	V_{GS}=V_{DS}, I_D=250μA	-0.3	-0.65	-1	V
$R_{DS(ON)}$	Drain-Source On Resistance	V_{GS}=-4.5V,I_D=-0.5A	---	1000	1200	mΩ
		V_{GS}=-2.5V,I_D=-0.2A	---	1300	1500	
Dynamic Characteristics[4]						
C_{iss}	Input Capacitance	V_{DS}=-10V, V_{GS}=0V, f=1MHz	---	87	---	pF
C_{oss}	Output Capacitance		---	15	---	
C_{rss}	Reverse Transfer Capacitance		---	8.2	---	
Switching Characteristics[4]						
$t_{d(on)}$	Turn-On Delay Time	V_{DS} = -30 V, V_{GEN} = -10 V, R_G = 25 Ω, R_L = 60 Ω, I_{DS} = -0.67 A		5.6	---	ns
t_r	Rise Time			5.3	---	ns
$t_{d(off)}$	Turn-Off Delay Time			30	---	ns
t_f	Fall Time			21	---	ns
Q_g	Total Gate Charge	V_{GS}=-10V,V_{DS}=-4.5V,I_D=-0.67A	---	1.8	---	nC
Q_{gs}	Gate-Source Charge		---	0.82	---	nC
Q_{gd}	Gate-Drain “Miller” Charge		---	0.59	---	nC
Drain-Source Diode Characteristics						
V_{SD}	Source-Drain Diode Forward Voltage[1]	V_{GS}=0V,I_S=0.5A	---	---	-1.3	V

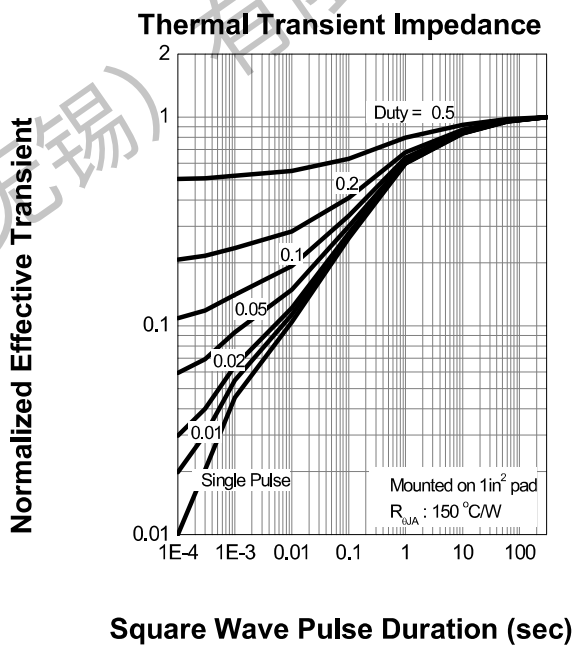
Notes：
a : Pulse test ; pulse width ≤ 300 μs, duty cycle ≤ 2 %
b : Guaranteed by design, not subject to production testing

P-Typical Characteristics

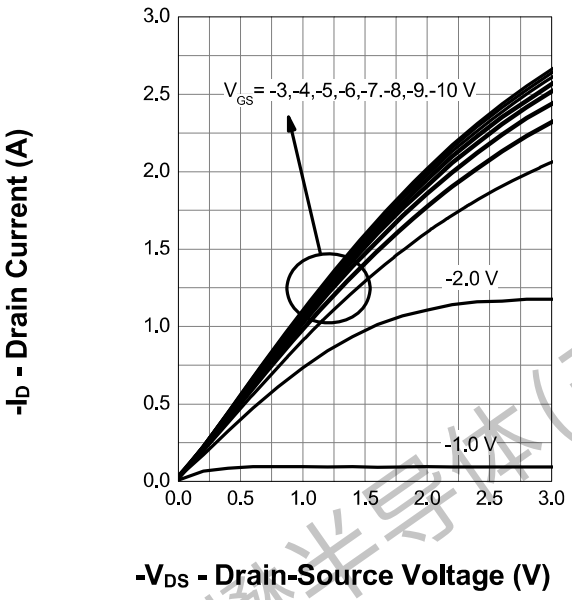




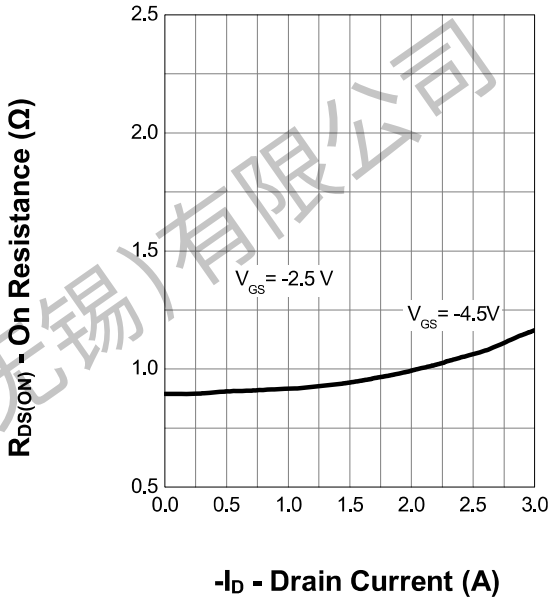




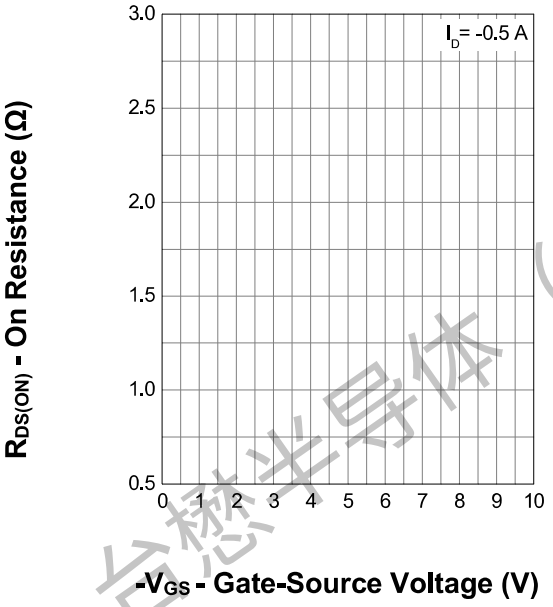
Output Characteristics



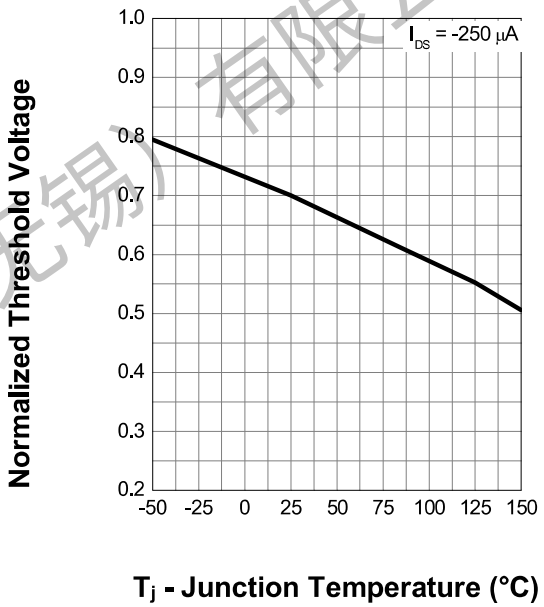
Drain-Source On Resistance



Transfer Characteristics



Gate Threshold Voltage



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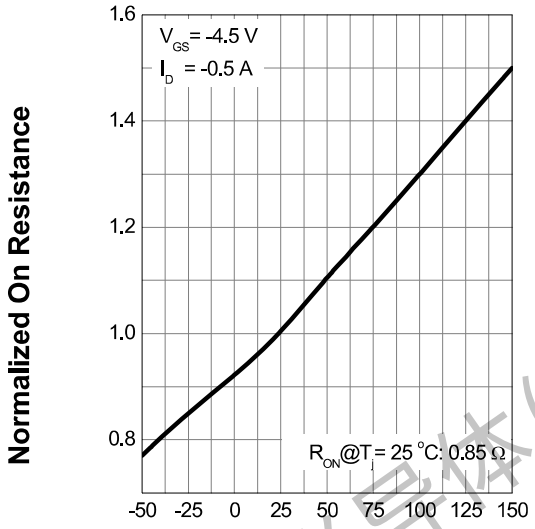
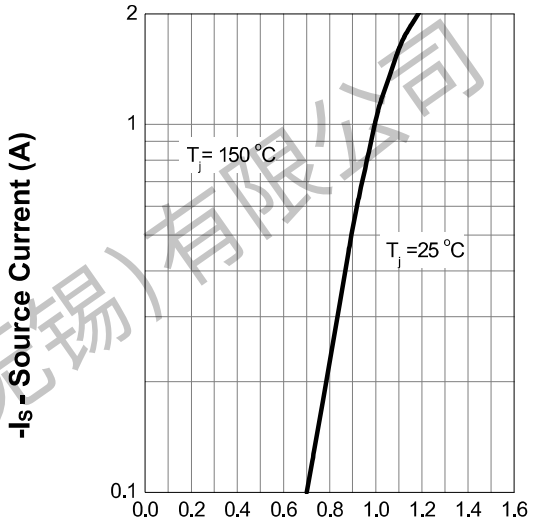
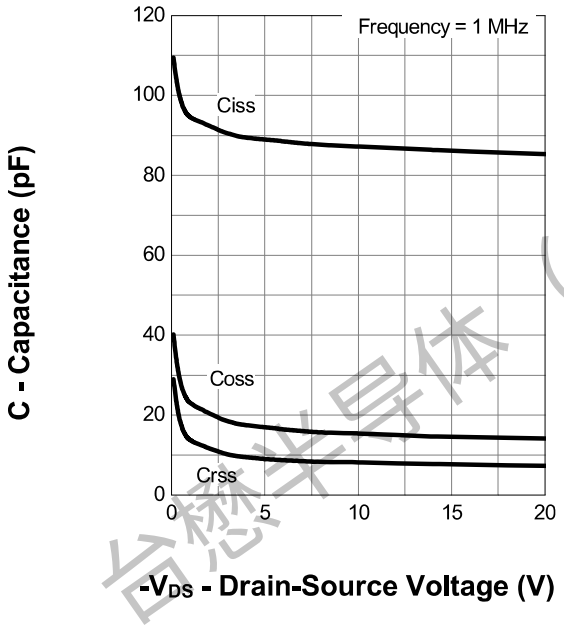
Drain-Source On Resistance



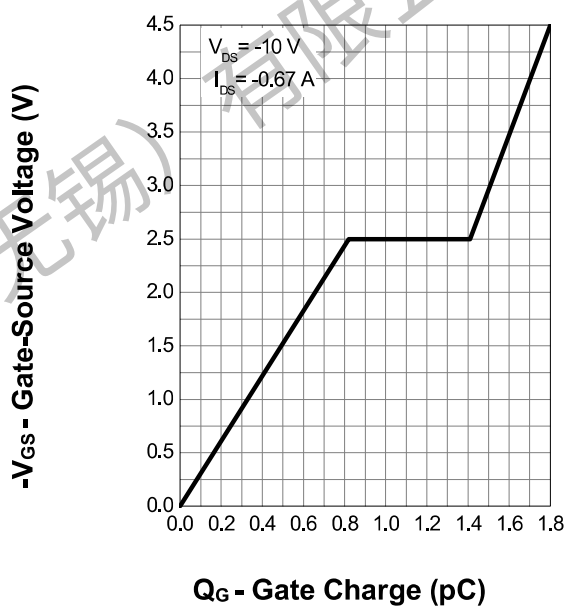
Source-Drain Diode Forward



Capacitance



Gate Charge



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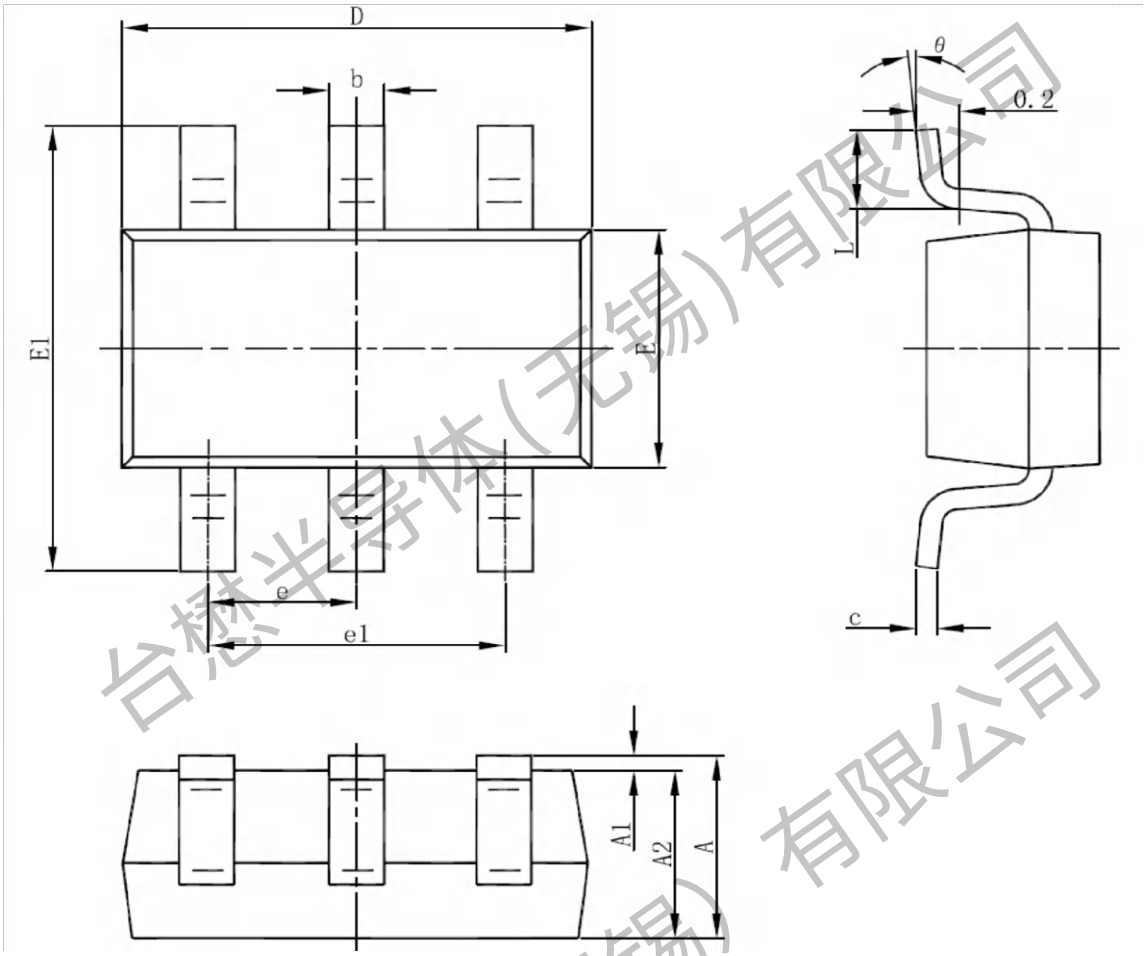
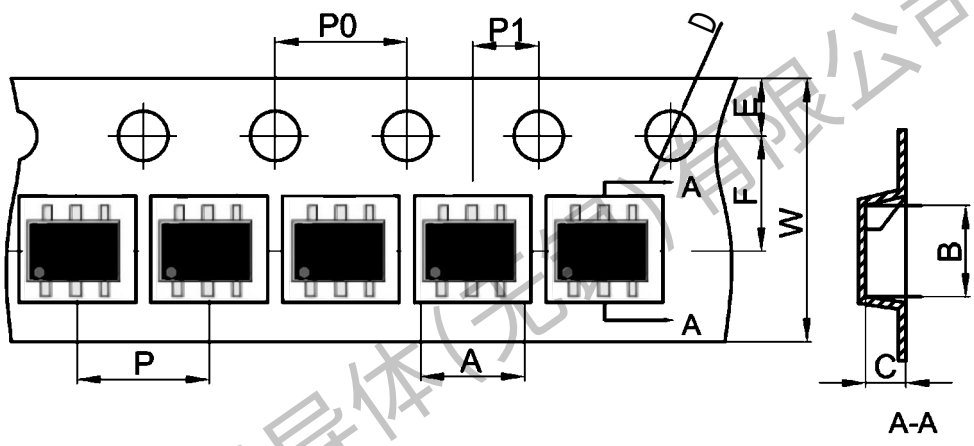
Package Mechanical Data:SOT-23-6L



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°

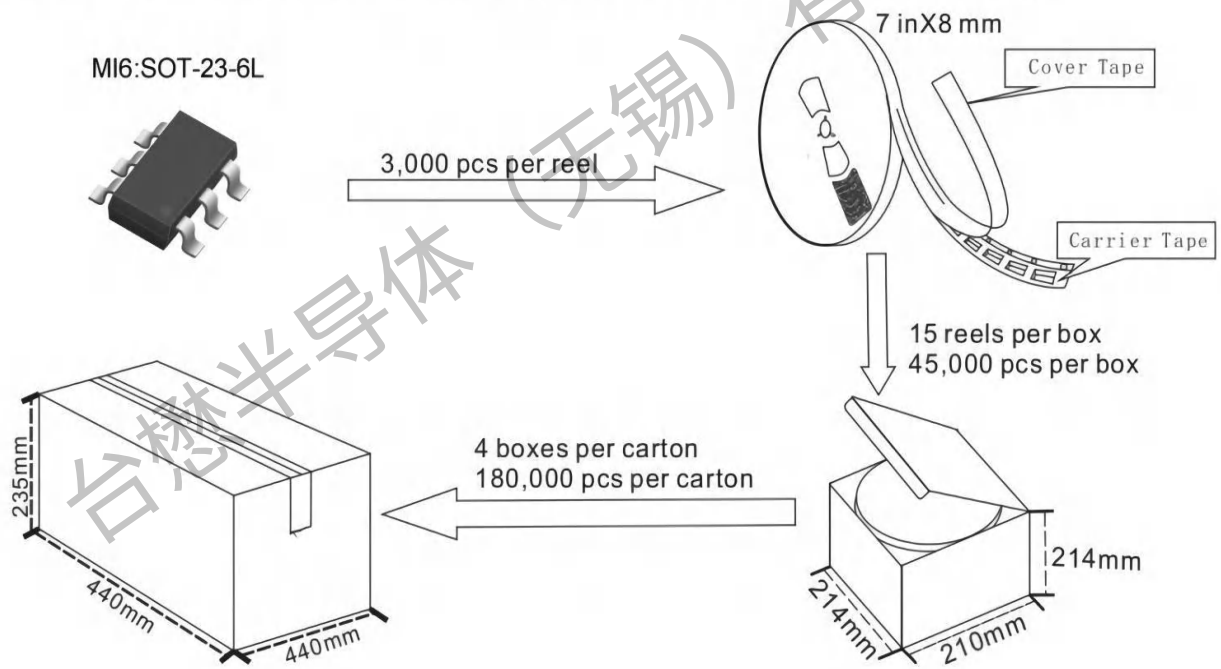
SOT-23-6L Embossed Carrier Tape



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
2023.03.23	23.03	Original	