

TM01G02MI6

N+P-Channel Enhancement Mode Mosfet

General Description

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

Applications

- Load switch
- PWM

General Features

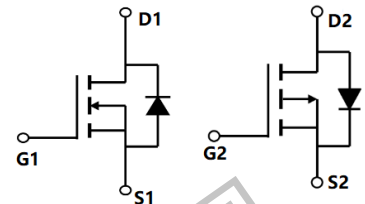
N Channel

$V_{DS} = 20V, I_D = 1.1A$
 $R_{DS(ON)} = 500m\Omega (typ.) @ V_{GS} = 4.5V$

P Channel

$V_{DS} = -20V, I_D = -0.8A$
 $R_{DS(ON)} = 1000m\Omega (typ.) @ V_{GS} = -4.5V$

100% UIS Tested
100% R_g Tested



Absolute Maximum Ratings: ($T_C = 25^\circ C$ 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- $T_J = 150^\circ C$	1.1	-0.8	A
	Continuous Drain Current- $T_C = 100^\circ C$	5	-4	
P_D	Power Dissipation	0.8	0.8	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +175		$^\circ C$

Thermal Characteristics:

Symbol	Parameter	N-CH	P-CH	Units
R	Thermal Resistance, Junction to Ambient	156	156	$^\circ C/W$

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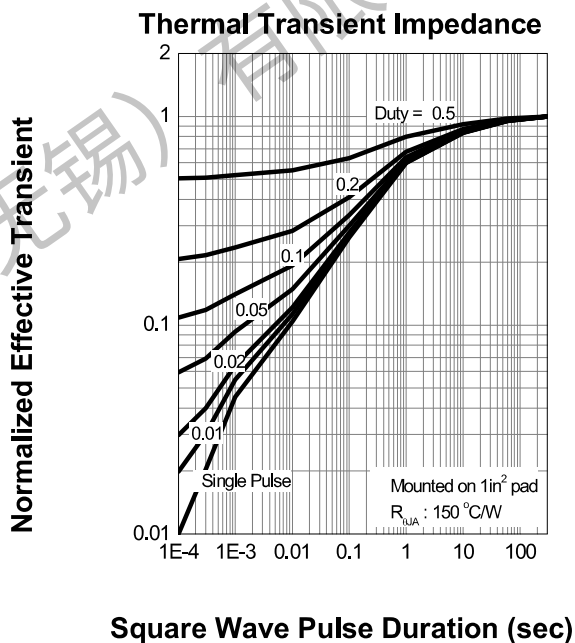
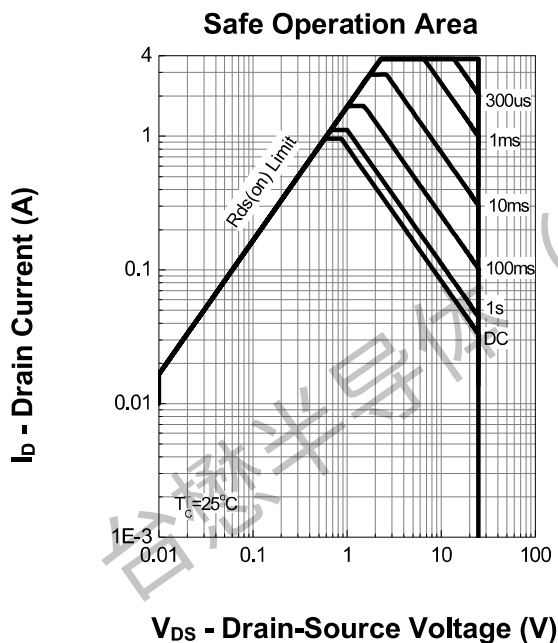
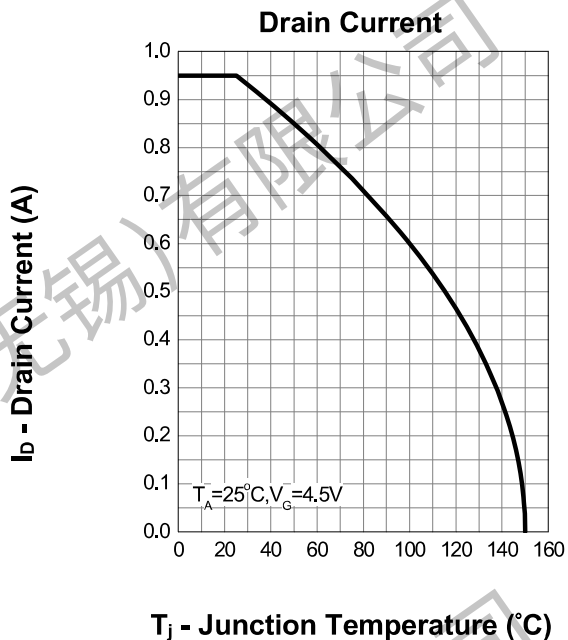
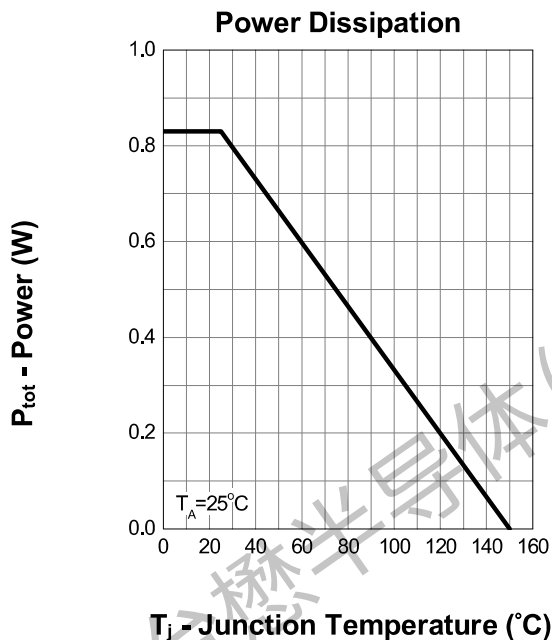
N-Channel Electrical Characteristics: ($T_C=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250 μA	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 =250 μA	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	---	
Q _g	Gate Charge	V _{GS} = 4.5 V, V _{DS} = 10 V, I _{DS} = 0.95 A		0.6	---	nC
Q _{gs}	Gate-Source Charge			0.26	---	
Q _{gd}	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

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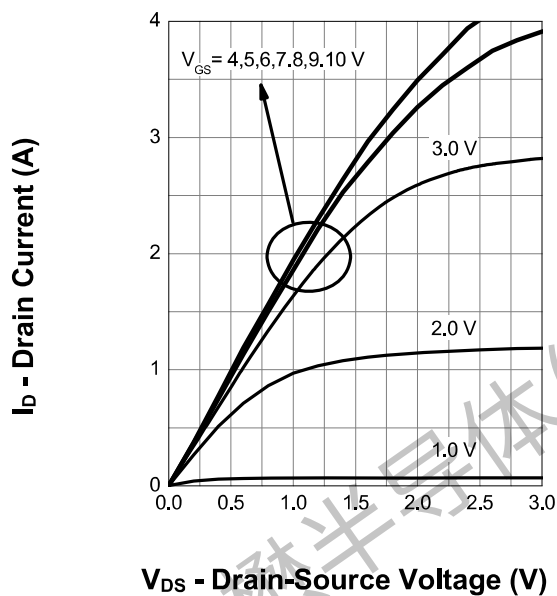
N-Typical Characteristics



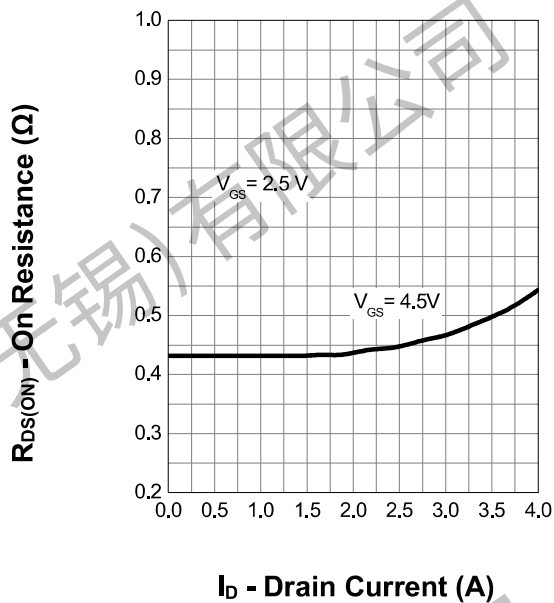
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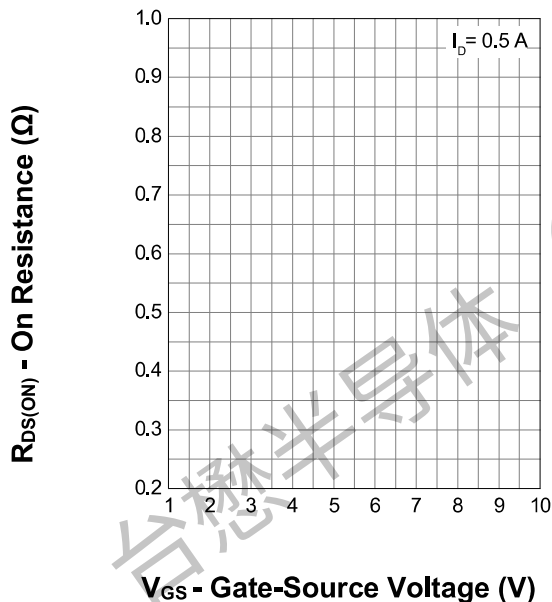
Output Characteristics



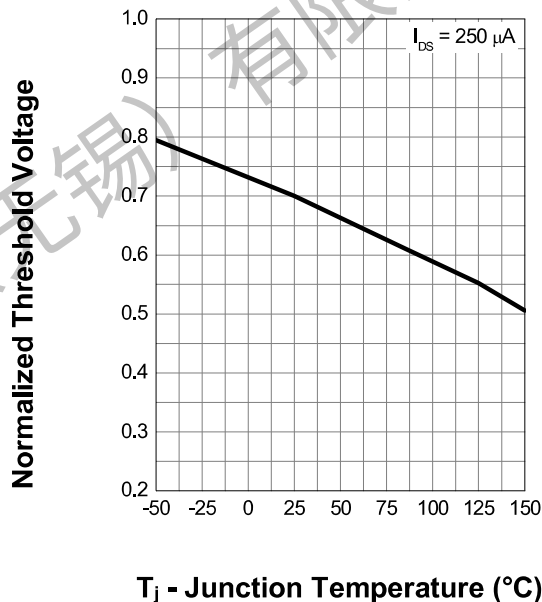
Drain-Source On Resistance



Transfer Characteristics

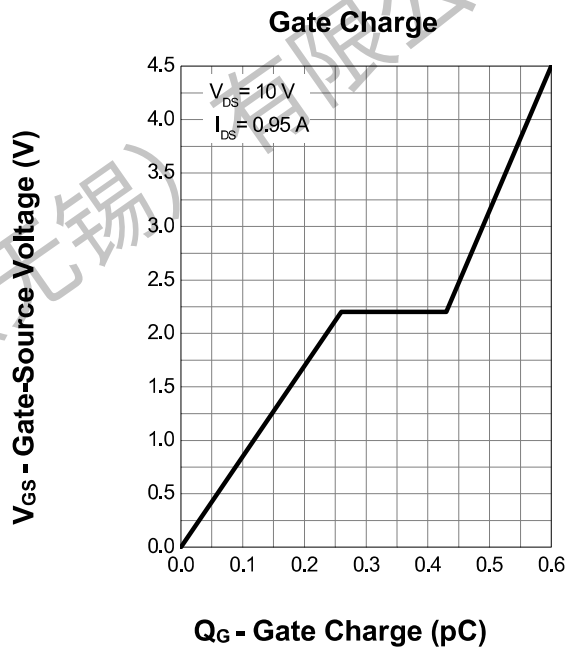
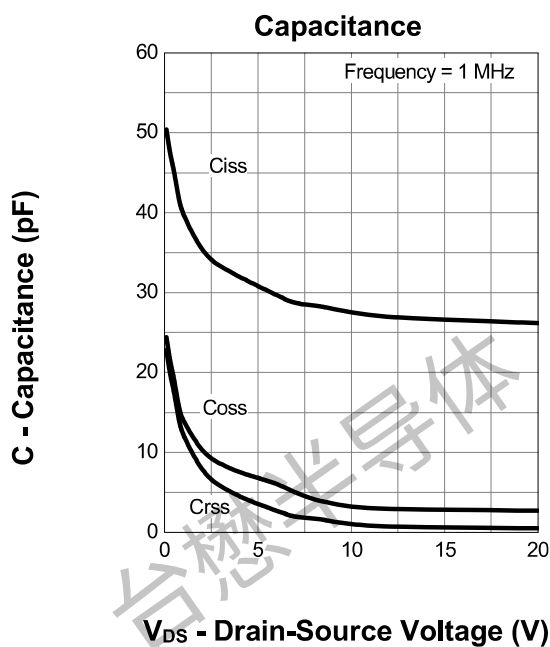
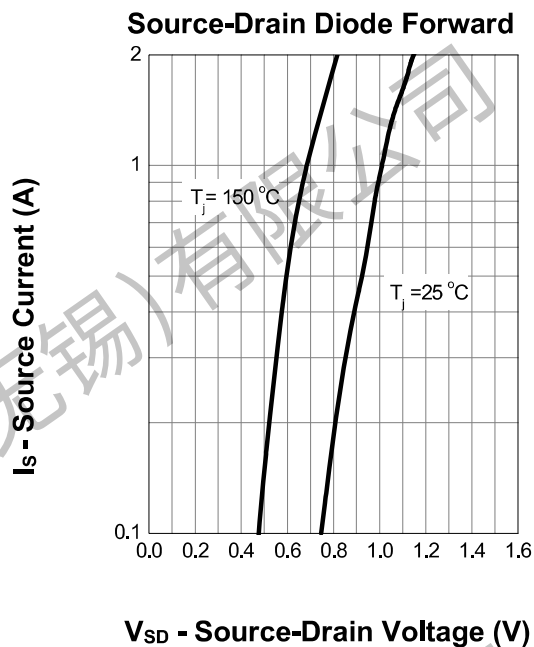
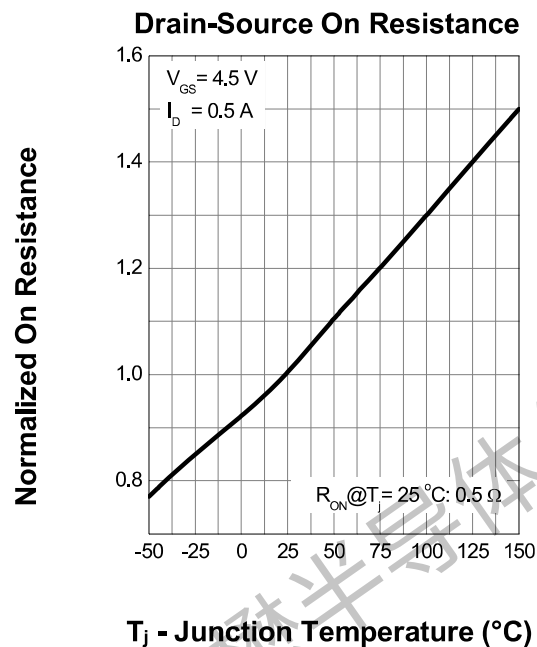


Gate Threshold Voltage



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P-Channel Electrical Characteristics: ($T_C=25^{\circ}\text{C}$ 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	-20	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{GS} =0V, V _{DS} =-30V	---	---	1	μ A
I _{GSS}	Gate-Source Leakage Current	V _{GS} =± 8V, V _{DS} =0A	---	---	± 10	μ A
On Characteristics ³						
V _{GS(th)}	GATE-Source Threshold Voltage	V _{GS} =V _{DS} , I _D =250 μ A	-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

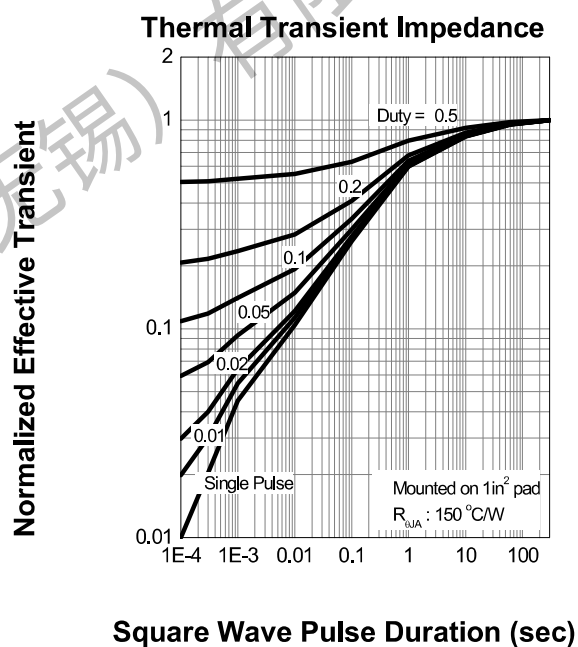
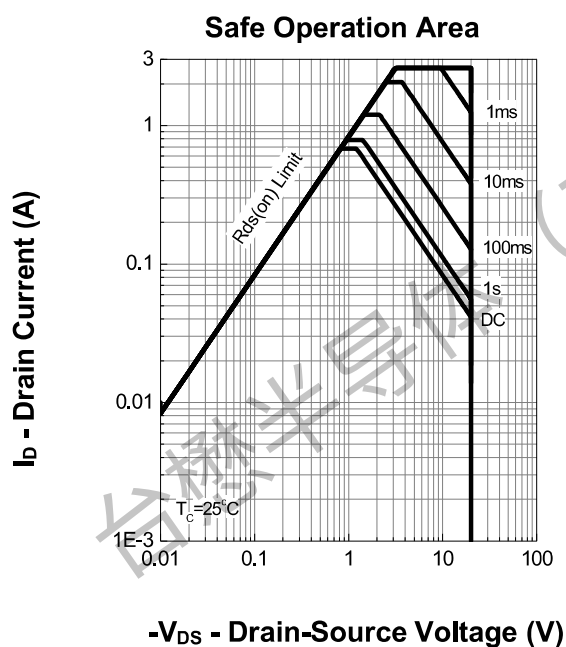
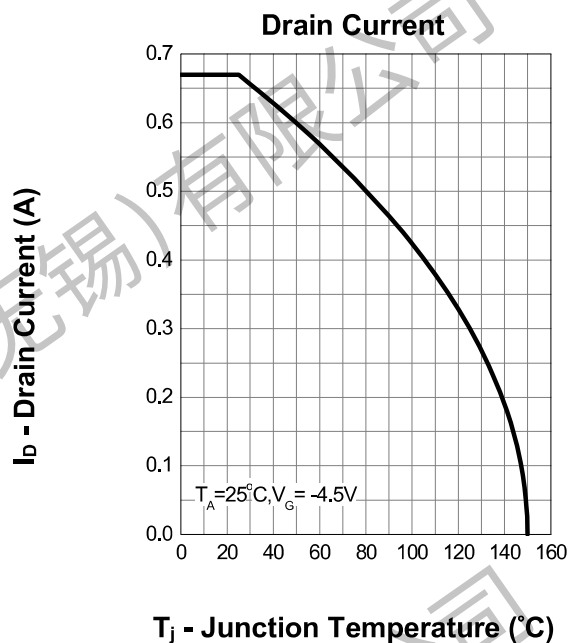
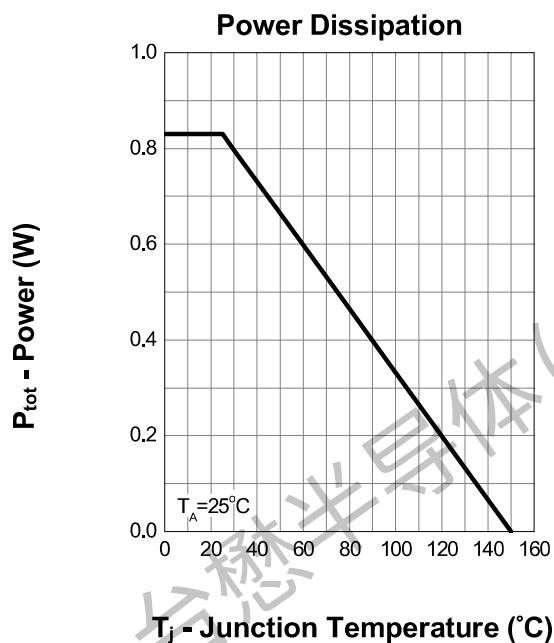
Notes :

- a : Pulse test ; pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
b : Guaranteed by design, not subject to production testing

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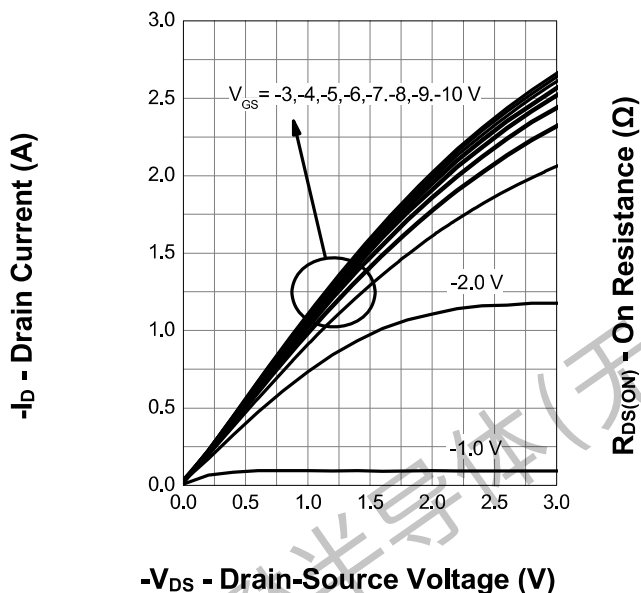
P-Typical Characteristics



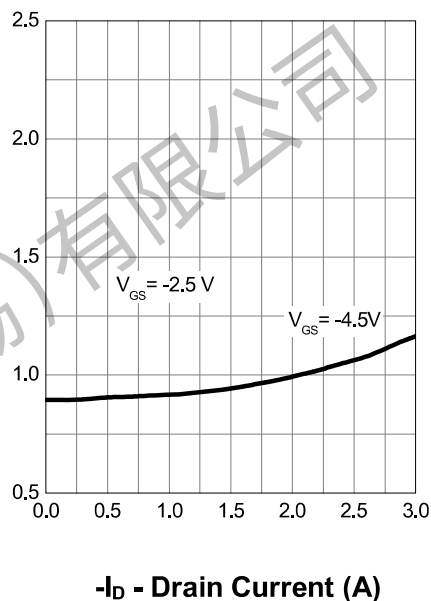
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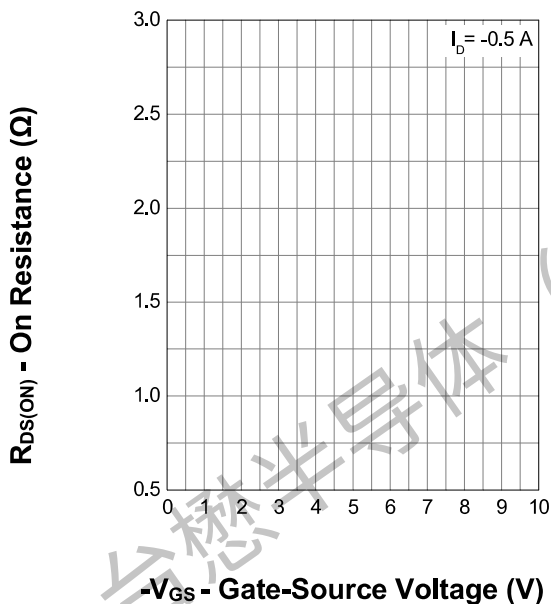
Output Characteristics



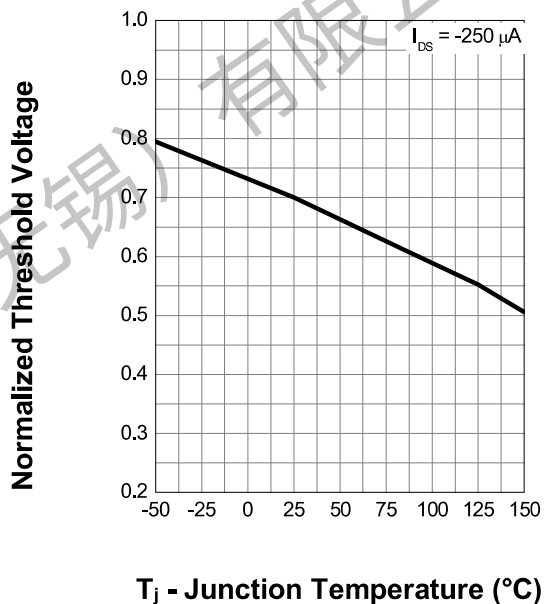
Drain-Source On Resistance



Transfer Characteristics



Gate Threshold Voltage

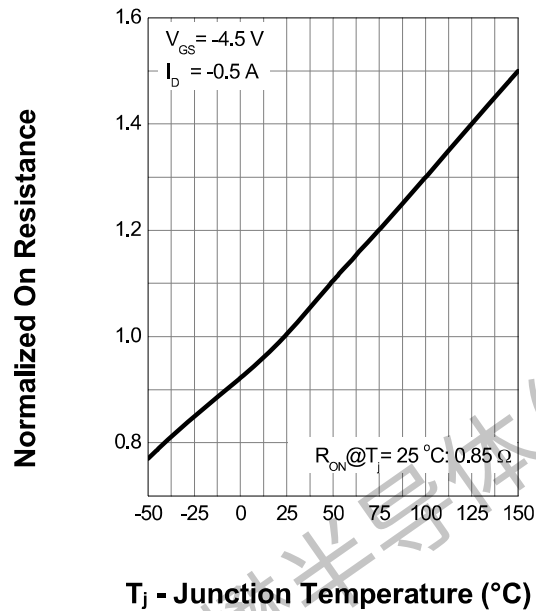




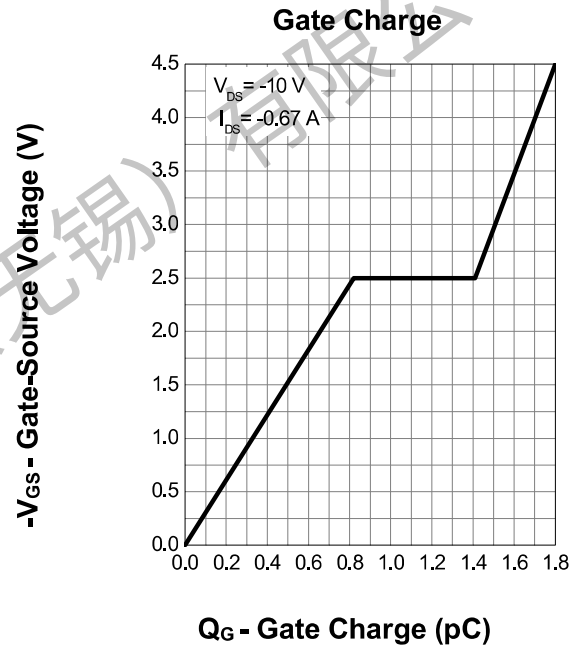
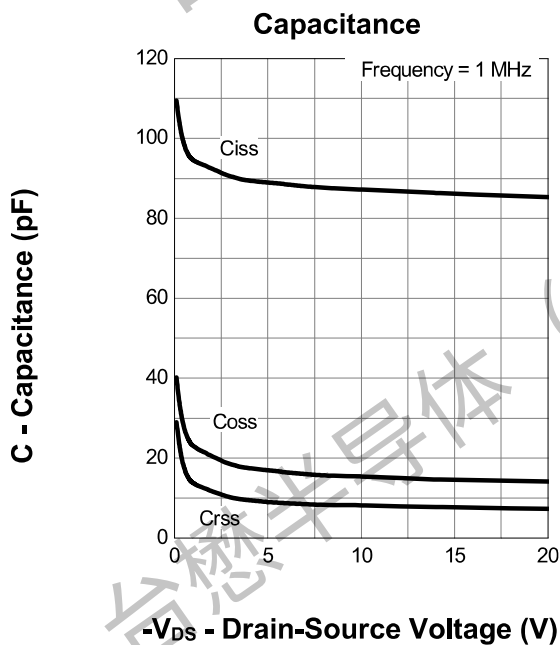
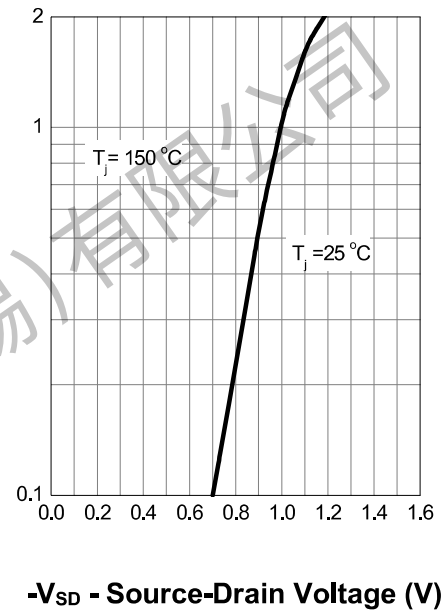
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Drain-Source On Resistance



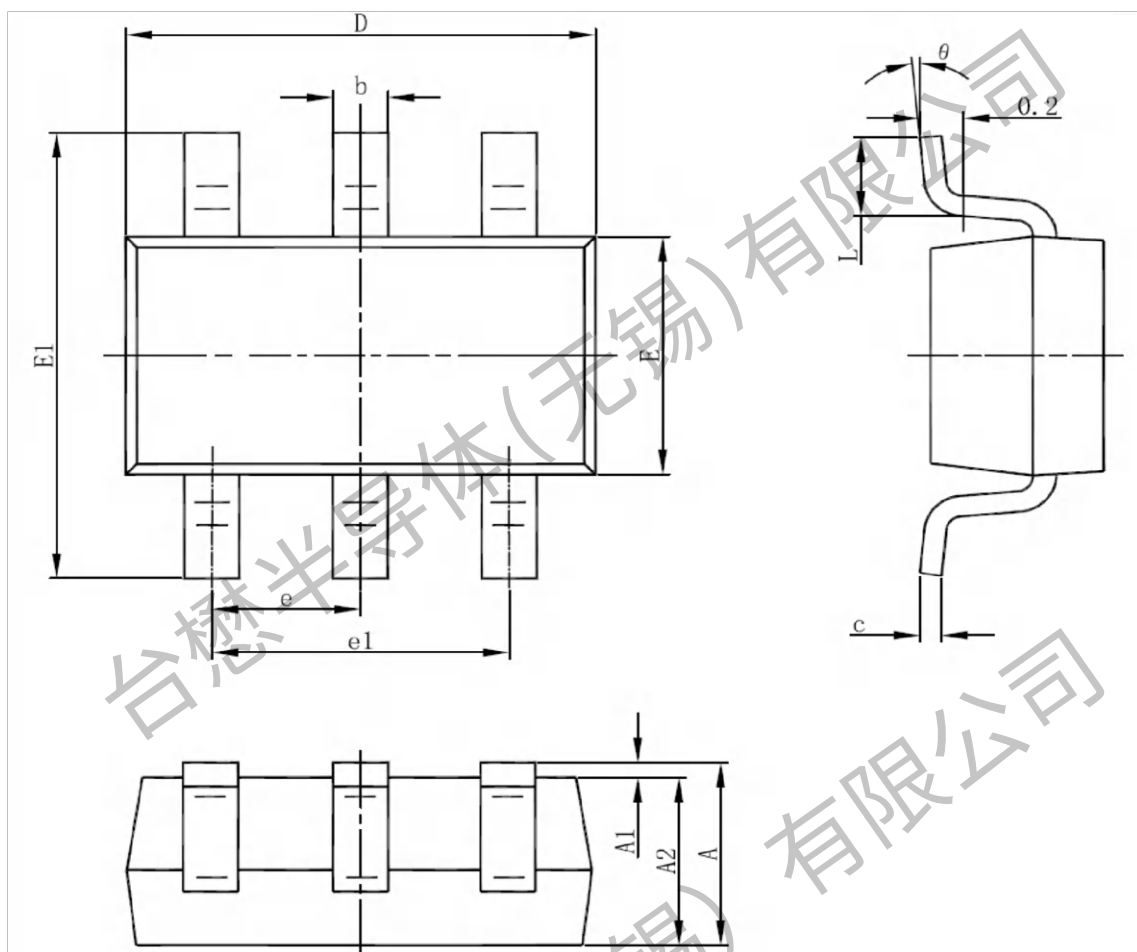
Source-Drain Diode Forward



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Package Mechanical Data:SOT-23-6L

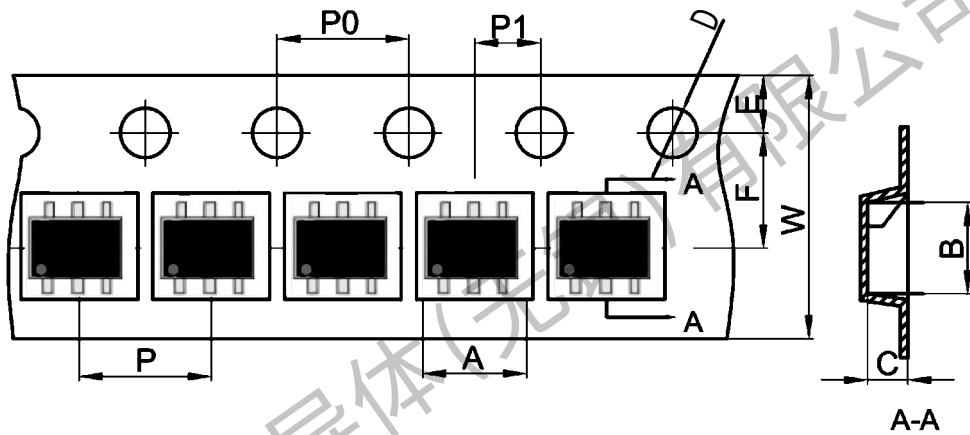


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)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

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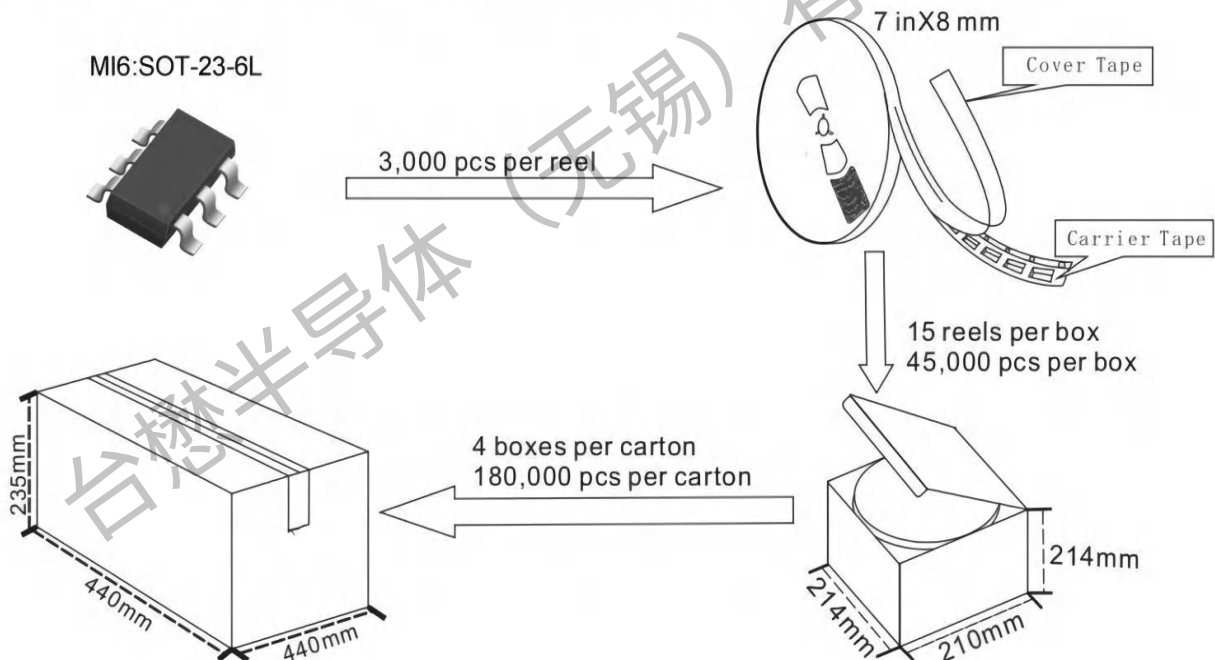
SOT-23-6L Embossed Carrier Tape



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	