

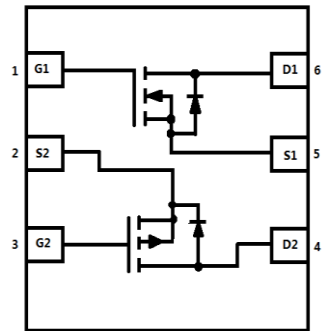
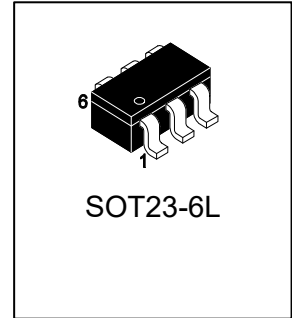
NP2601

S-NP2601

20 V Complementary Trench MOSFET

1. FEATURES

- N-Channel: $V_{DS} = 20V$
 $R_{DS(ON)} \leq 60m\Omega, V_{GS}@4.5V, I_{DS}@1A$
 $R_{DS(ON)} \leq 75m\Omega, V_{GS}@2.5V, I_{DS}@1A$
 $R_{DS(ON)} \leq 100m\Omega, V_{GS}@1.8V, I_{DS}@1A$
- P-Channel: $V_{DS} = -20V$
 $R_{DS(ON)} \leq 80m\Omega, V_{GS}@-4.5V, I_{DS}@-1.0A$
 $R_{DS(ON)} \leq 95m\Omega, V_{GS}@-2.5V, I_{DS}@-1.0A$
 $R_{DS(ON)} \leq 120m\Omega, V_{GS}@-1.8V, I_{DS}@-1.0A$
- We declare that the material of product compliance with RoHS requirements and Halogen Free.
- S- prefix for automotive and other applications requiring unique site and control change requirements; AEC-Q101 qualified and PPAP capable.



2. DEVICE MARKING AND ORDERING INFORMATION

Device	Marking	Shipping
NP2601	NP1	3000/Tape&Reel

3. Absolute Maximum Ratings (TA =25 °C unless otherwise noted)

Parameter (N-Channel)	Symbol	Limits	Unit
Drain–Source Voltage	V_{DS}	20	V
Gate–Source Voltage	V_{GS}	± 8	V
Drain Current-Continuous	I_D	3	A
Drain Current-Pulsed	I_{DM}	11	A
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 ~ +150	°C

Parameter (P-Channel)	Symbol	Limits	Unit
Drain–Source Voltage	V_{DS}	-20	V
Gate–Source Voltage	V_{GS}	± 8	V
Drain Current-Continuous	I_D	-2.5	A
Drain Current-Pulsed	I_{DM}	-9	A
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 ~ +150	°C

- 1.Repetitive Rating: Pulse width limited by the maximum junction temperature
2. 1-in ² 2oz Cu PCB board



4. ELECTRICAL CHARACTERISTICS (Ta= 25°C)

N-Channel

Parameter	Symbol	Min.	Typ.	Max.	Unit
Static					
Drain-Source Breakdown Voltage (VGS = 0V, ID = 250μA)	BVDSS	20	-	-	V
Drain-Source On-State Resistance (VGS=4.5V, ID=1.0A) (VGS=2.5V, ID=1.0A) (VGS=1.8V, ID=1A)	RDS(on)	- - -	- - -	60 75 100	mΩ
Gate Threshold Voltage (VDS = VGS, ID = 250uA)	VGS(th)	0.4	-	1.2	V
Zero Gate Voltage Drain Current (VDS = 20V, VGS = 0V)	IDSS	-	-	1.0	uA
Gate Body Leakage (VGS = ± 8V, VDS = 0V)	IGSS	-	-	±1	uA
Source-Drain Diode					
Diode Forward Voltage (IS = 1.0A, VGS = 0V)	VSD	-	-	1.5	V
Dynamic					
Input Capacitance	(VDS = 8V, VGS = 0V, f=1MHz)	Ciss	642		pF
Output Capacitance		Coss	62.4		
Reverse Transfer Capacitance		Crss	53.6		
Total Gate Charge	(VDS = 10V, ID=6A, VGS=4.5V)	Qg	6.7		nC
Gate-Source Charge		Qgs	0.87		
Gate-Drain Charge		Qgd	2.34		
Turn-On Delay Time	(VDD=10V, RG =6.2Ω, ID= 1A, VGS= 4.5V, RL= 10Ω, tp=10us)	td(on)	11.5		ns
Turn-On Rise Time		tr	16		
Turn-Off Delay Time		td(off)	72.7		
Turn-Off Fall Time		tf	24.6		
Gate Resistance (VDS=0V, VGS=0V, f=1.0MHz)	Rg	-	5.25	-	Ω



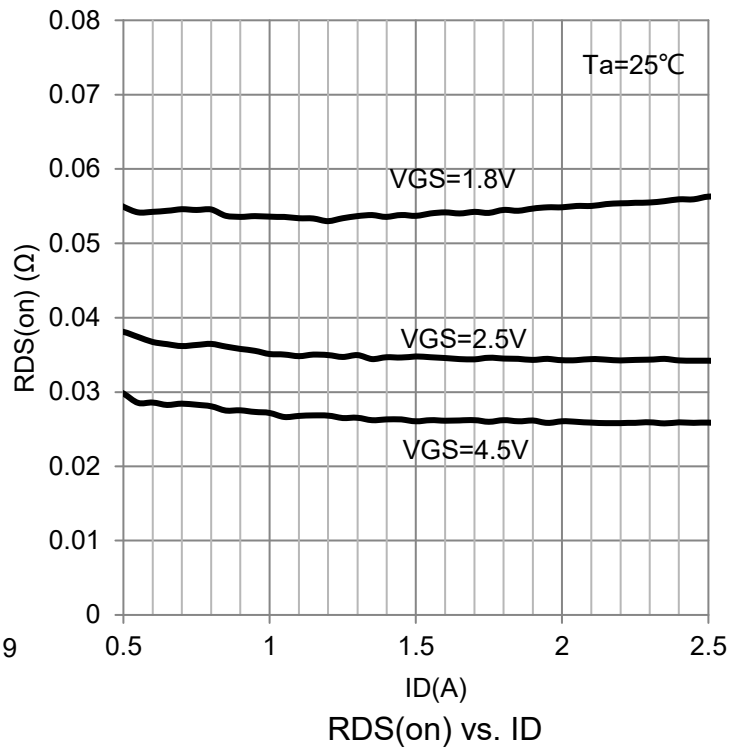
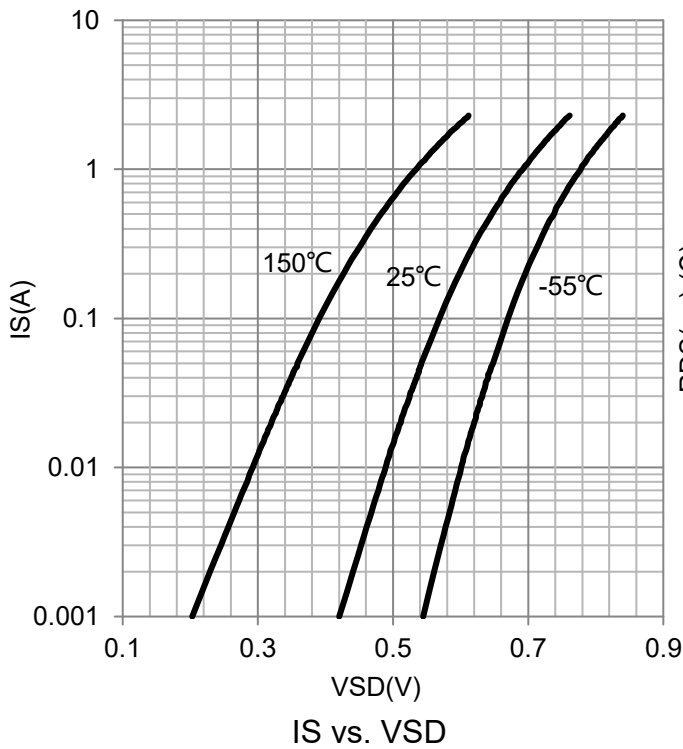
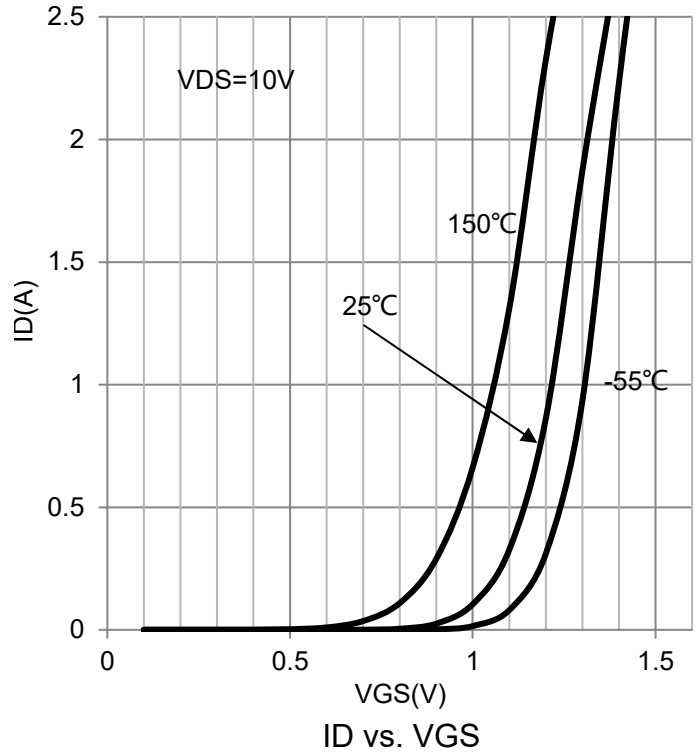
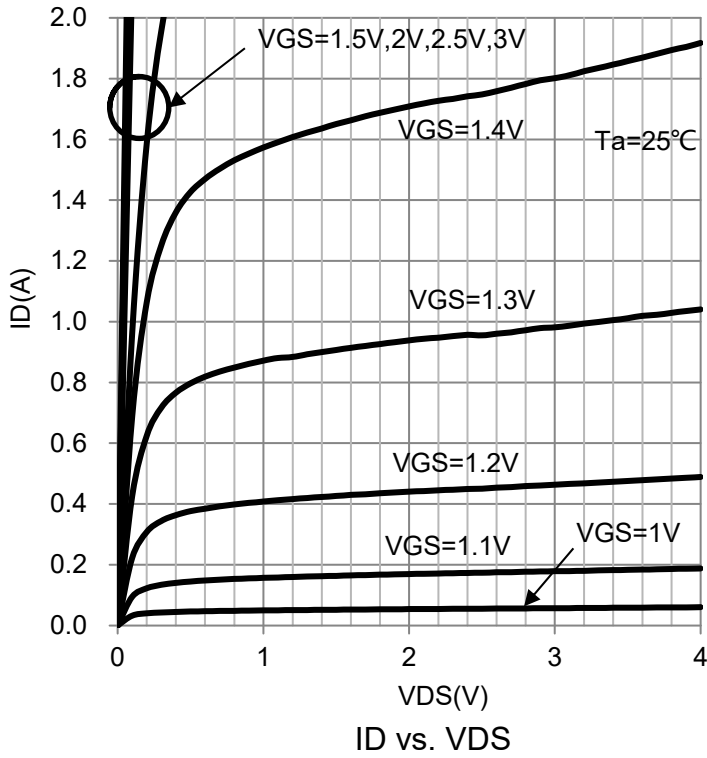
4. ELECTRICAL CHARACTERISTICS (Ta= 25°C)

P-Channel

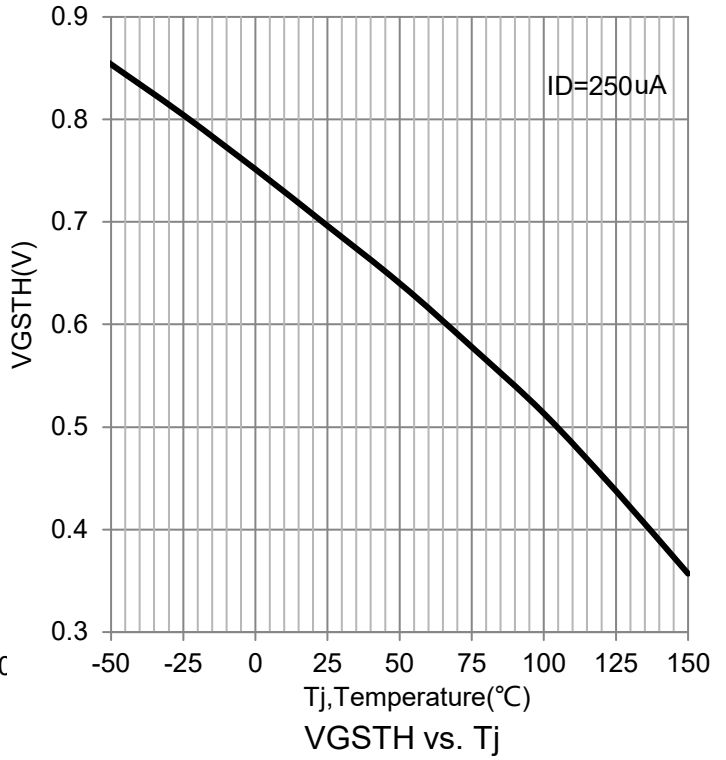
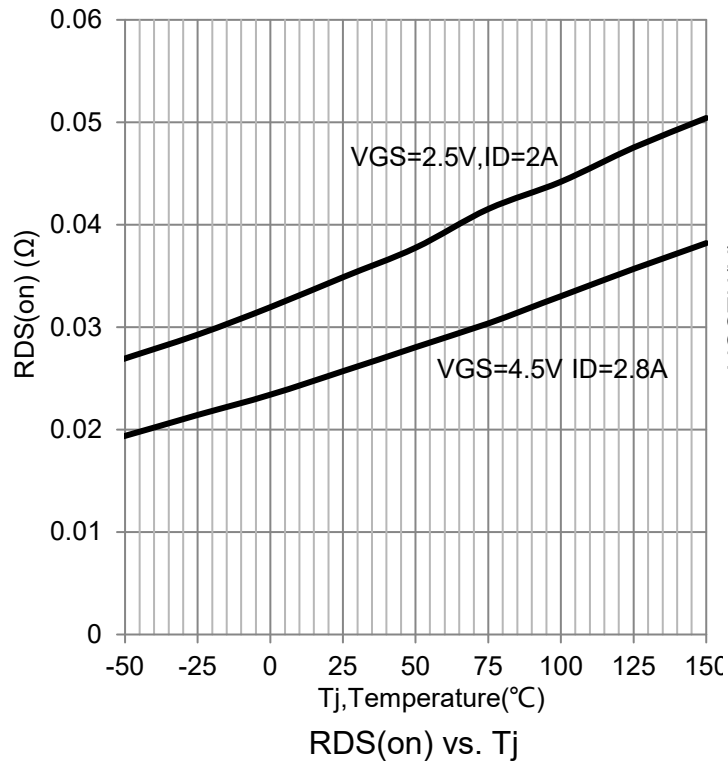
Parameter	Symbol	Min.	Typ.	Max.	Unit
Static					
Drain-Source Breakdown Voltage (VGS = 0V, ID = -250 μ A)	BVDSS	-20	-	-	V
Drain-Source On-State Resistance (VGS = -4.5V, ID = -1.0A) (VGS = -2.5V, ID = -1.0A) (VGS = -1.8V, ID = -1.0A)	RDS(on)	- - -	- - -	80 95 120	m Ω
Gate Threshold Voltage (VDS = VGS, ID = -250 μ A)	VGS(th)	-0.4	-	-1	V
Zero Gate Voltage Drain Current (VDS = -20V, VGS = 0V)	IDSS	-	-	-1	μ A
Gate Body Leakage (VGS = \pm 8V, VDS = 0V)	IGSS	-	-	\pm 1	μ A
Source-Drain Diode					
Diode Forward Voltage (IS = -1.0A, VGS = 0V)	VSD	-	-	-1.5	V
Dynamic					
Input Capacitance	(VDS = -4V, VGS = 0V, f=1MHz)	Ciss	667		pF
Output Capacitance		Coss	85		
Reverse Transfer Capacitance		Crss	70.5		
Total Gate Charge	(VDS = -6V, ID = -2.8A, VGS = -4.5V)	Qg	9.1		nC
Gate-Source Charge		Qgs	2.0		
Gate-Drain Charge		Qgd	1.7		
Turn-On Delay Time	(VDD = -4V, RL = 4.1 Ω , ID = -1A, VGEN = -4.5V, RG = 6.2 Ω)	td(on)	11.6		ns
Turn-On Rise Time		tr	14.7		
Turn-Off Delay Time		td(off)	62.4		
Turn-Off Fall Time		tf	23.6		
Gate Resistance (VDS = 0V, VGS = 0V, f = 1.0MHz)	Rg	-	4.8	-	Ω



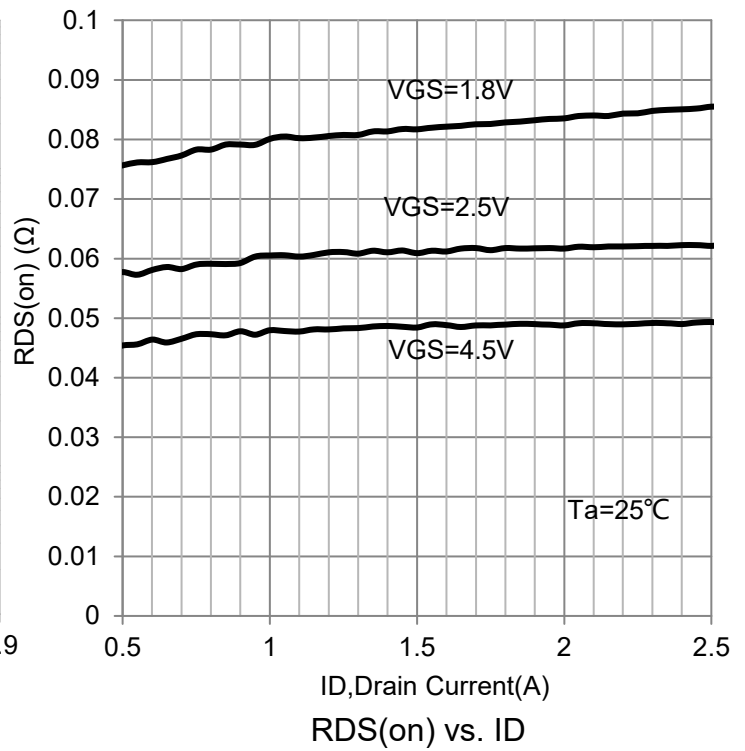
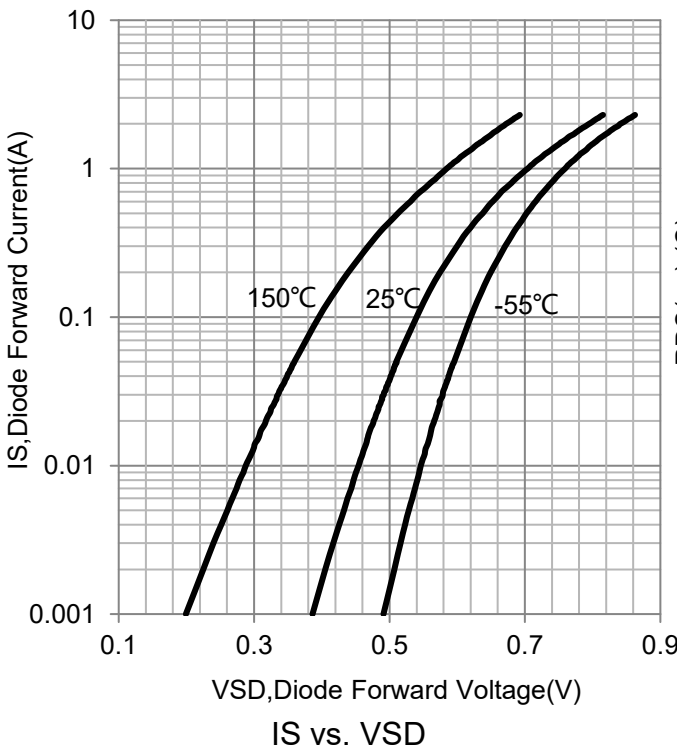
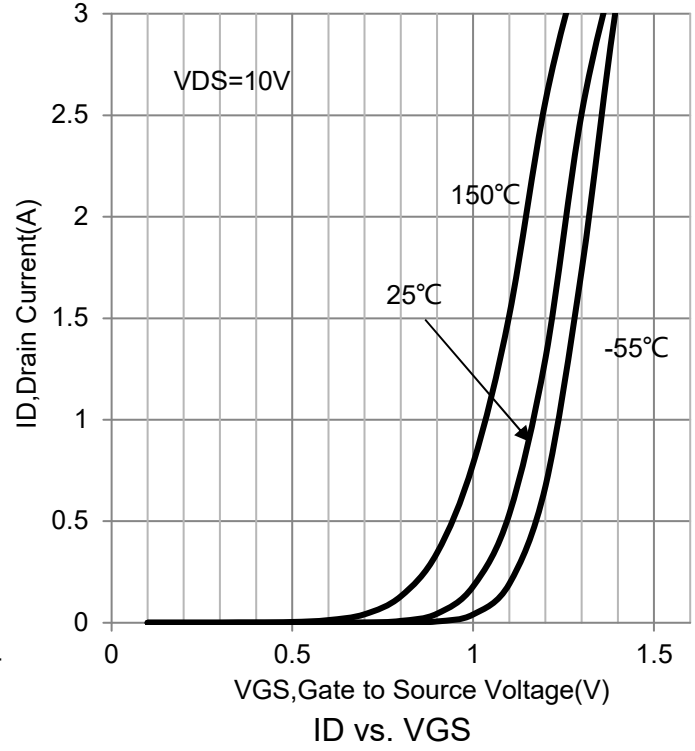
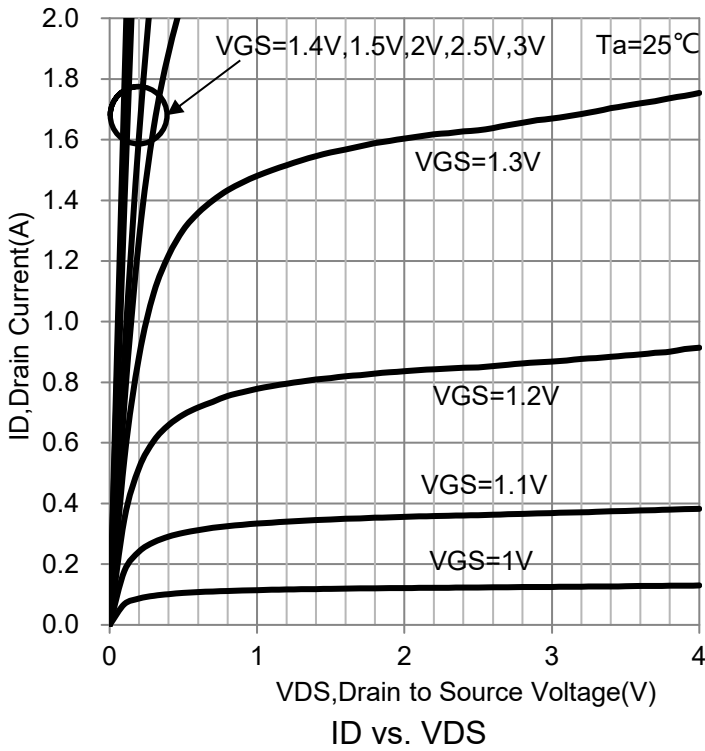
5.ELECTRICAL CHARACTERISTICS CURVES(N-Channel)



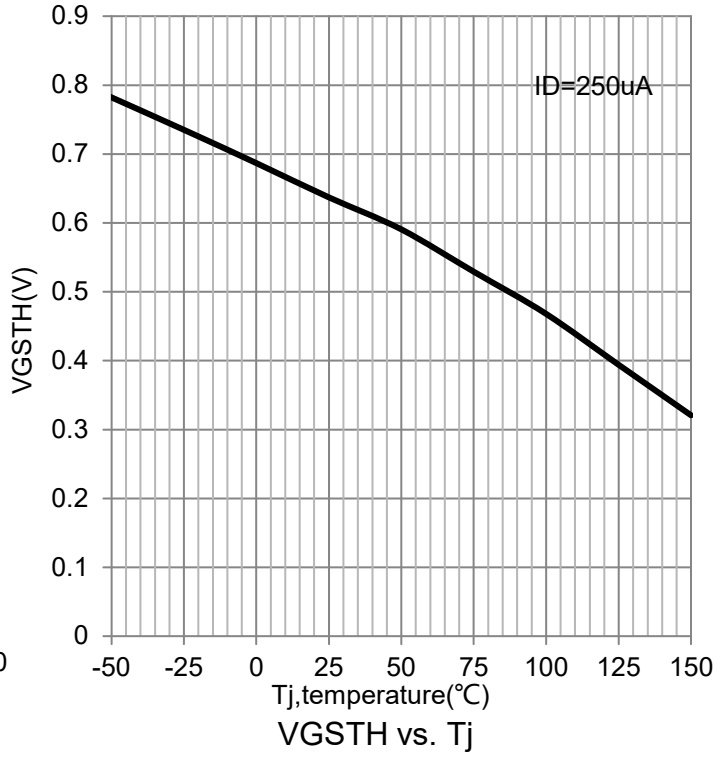
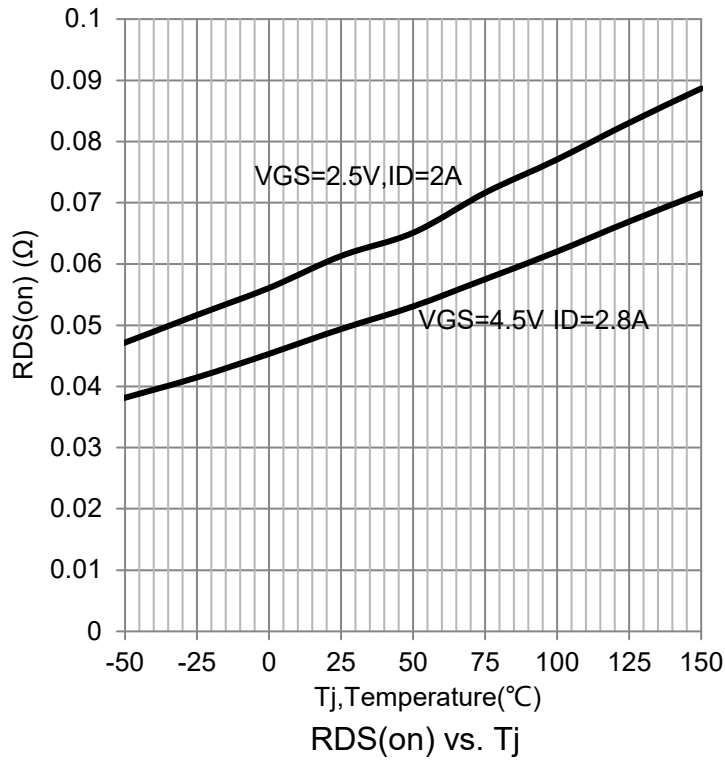
5.ELECTRICAL CHARACTERISTICS CURVES(N-Channel)(Con.)



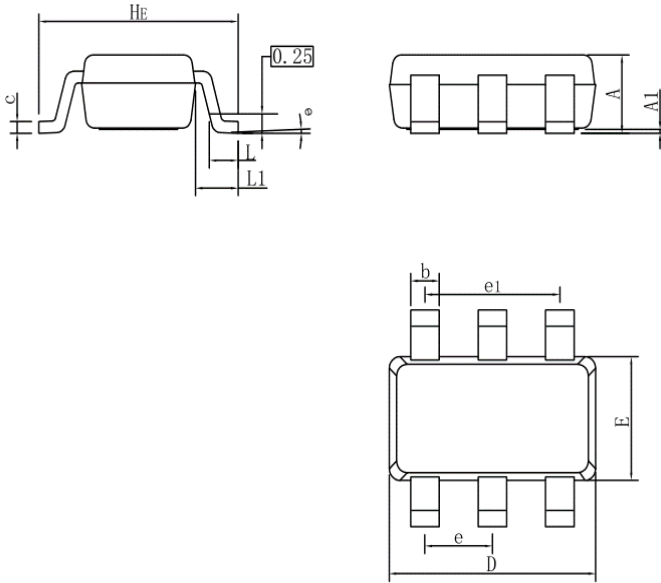
5.ELECTRICAL CHARACTERISTICS CURVES(P-Channel)



5.ELECTRICAL CHARACTERISTICS CURVES(P-Channel)(Con.)

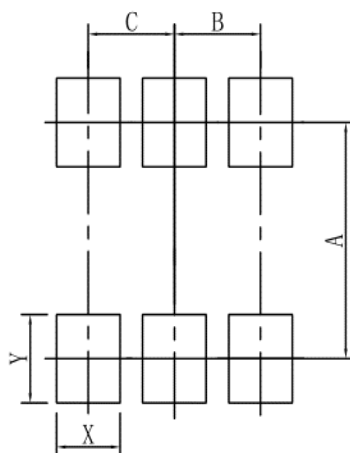


6. OUTLINE AND DIMENSIONS



SOT23-6L			
DIM	MIN	NOR	MAX
A	0.90	1.00	1.10
A1	0.01	0.06	0.10
b	0.30	0.40	0.50
c	0.10	0.17	0.20
D	2.80	2.90	3.00
E	1.50	1.60	1.70
e	0.85	0.95	1.05
e1	1.80	1.90	2.00
L	0.20	0.40	0.60
L1	0.60REF		
HE	2.60	2.80	3.00
θ	0°	-	10°

7. SOLDERING FOOTPRINT



SOT23-6L	
DIM	(mm)
X	0.70
Y	0.90
A	2.40
B	0.95
C	0.95

