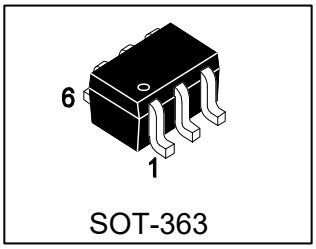
MNP0720D

S-MNP0720D

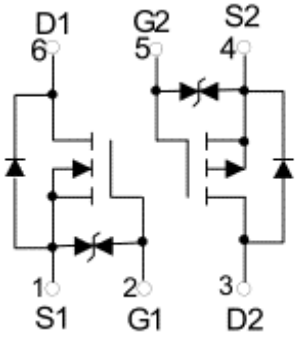
N channel+P Channel MOSFET

1. FEATURES

- 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.
- Low RDS (on)
- Operated at Low Logic Level Gate Drive
- ESD Protected Gate



SOT-363



2. APPLICATION

- Load/ Power Switching
- Interfacing Switching
- Battery Management for Ultra Small Portable Electronics
- Logic Level Shift

3. DEVICE MARKING AND ORDERING INFORMATION

Device	Marking	Shipping
MNP0720D	DW	3000/Tape&Reel

4. MAXIMUM RATINGS(Ta = 25ºC)

Parameter	Symbol	Limits	Unit
N-MOSFET			
Drain-Source Voltage	VDSS	20	V
Gate-Source Voltage	VGSS	±10	V
Drain Current (TA = 25 ℃, VGS = 10 V)	ID	0.9	A
Pulsed Drain Current (TA = 25 ℃, VGS = 10 V)	IDM	3.6	A
Thermal Resistance- Junction to Ambient	RθJA	250	℃/W
Storage Temperature	Tstg	-55~+150	℃
Junction Temperature	TJ	150	℃
P-MOSFET			
Drain-Source Voltage	VDSS	-20	V
Gate-Source Voltage	VGSS	±10	V
Drain Current (TA = 25 ℃, VGS = -4.5 V)	ID	-0.67	A
Pulsed Drain Current (TA = 25 ℃, VGS = -4.5 V)	IDM	-2.6	A
Thermal Resistance- Junction to Ambient	RθJA	150	℃/W
Storage Temperature	Tstg	-55~+150	℃
Junction Temperature	TJ	150	℃

5. ELECTRICAL CHARACTERISTICS (Ta= 25°C)

N-MOSFET

Characteristic		Symbol	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage (VGS = 0 V, IDS = 250 μA)		BVDSS	20	-	-	V
Gate Threshold Voltage (VDS = VGS , IDS = 250 μA)		VGS(th)	0.3	0.65	1	V
Drain Leakage Current (VDS = 16 V, VGS = 0V) (VDS = 16 V, VGS = 0V, TJ = 85 ℃)		IDSS	- -	- -	1 30	μA
Gate Leakage Current (VGS = ±8 V, VDS = 0 V)		IGSS	-	-	±10	μA
On-State Resistance (VGS = 4.5 V, IDS = 0.5 A) (VGS = 2.5 V, IDS = 0.2 A) (VGS = 1.8 V, IDS = 0.1 A) (VGS = 1.5 V, IDS = 0.05 A) (VGS = 1.2 V, IDS = 0.02 A)		RDS(ON)	- - - - -	0.25 0.35 0.4 0.5 1	0.4 0.65 0.8 - -	Ω
Diode Characteristics						
Diode Forward Voltage (ISD = 0.5 A, VGS = 0 V)		VSD	-	0.7	1.3	V
Dynamic						
Input Capacitance	(VGS = 0 V, VDS = 10 V,f=1MHz)	Ciss	-	67	-	pF
Output Capacitance		Coss	-	19	-	
Reverse Transfer Capacitance		Crss	-	6	-	
Turn-On Delay Time	(VDS = 10 V, VGEN= 4.5 V,RG = 10 Ω, RL = 66 Ω,IDS = 0.15 A)	td(on)	-	2.8	-	nS
Rise Time		tr	-	20	-	
Turn-Off Delay Time		td(off)	-	23	-	
Fall Time		tf	-	23	-	
Total Gate Charge	(VGS = 4.5 V, VDS = 10 V,IDS = 0.5 A)	Qg	-	1.4	-	nC
Gate-Source Charge		Qgs	-	0.22	-	
Gate-Drain Charge		Qgd	-	0.21	-	

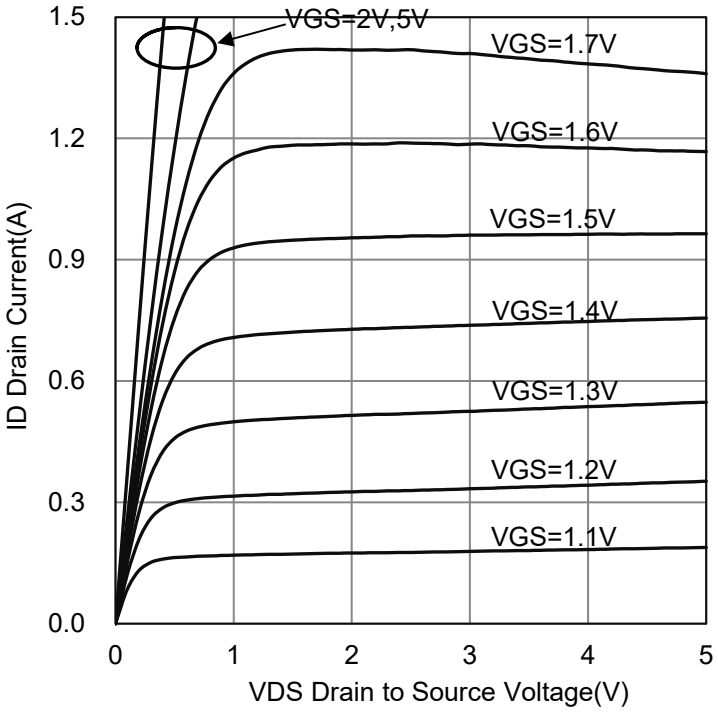
5. ELECTRICAL CHARACTERISTICS (Ta= 25°C)(Con.)

P-MOSFET

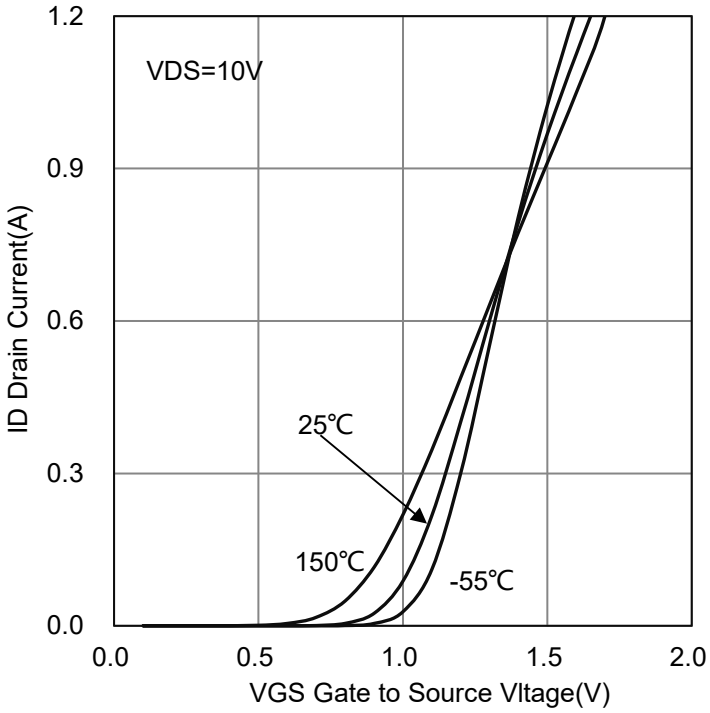
Characteristic		Symbol	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage (VGS = 0 V, IDS = -250 μA)		BVDSS	-20	-	-	V
Gate Threshold Voltage (VDS = VGS , IDS = -250 μA)		VGS(th)	-0.3	-0.65	-1	V
Drain Leakage Current (VDS = -16 V, VGS = 0V) (VDS = -16 V, VGS = 0V, TJ = 85 ℃)		IDSS	- -	- -	-1 -30	μA
Gate Leakage Current (VGS = ±8 V, VDS = 0 V)		IGSS	-	-	±10	μA
On-State Resistance (VGS = -4.5 V, IDS = -0.5 A) (VGS = -2.5 V, IDS = -0.2 A) (VGS = -1.8 V, IDS = -0.1 A) (VGS = -1.5 V, IDS = -0.04 A) (VGS = -1.2 V, IDS = -0.01 A)		RDS(ON)	- - - - -	0.85 1.05 1.2 1.5 2	1.2 1.5 2.2 - -	Ω
Diode Characteristics						
Diode Forward Voltage (ISD = 0.5 A, VGS = 0 V)		VSD	-	0.7	1.3	V
Dynamic						
Input Capacitance	(VGS = 0 V, VDS = -10 V,f=1MHz)	Ciss	-	87	-	pF
Output Capacitance		Coss	-	15	-	
Reverse Transfer Capacitance		Crss	-	8.2	-	
Turn-On Delay Time	(VDS = -30 V, VGEN= -10 V,RG =25 Ω, RL= 60 Ω,IDS = -0.67 A)	td(on)	-	5.6	-	nS
Rise Time		tr	-	5.3	-	
Turn-Off Delay Time		td(off)	-	30	-	
Fall Time		tf	-	21	-	
Total Gate Charge	(VGS = -4.5 V, VDS = -10 V,IDS = -0.67A)	Qg	-	1.8	-	nC
Gate-Source Charge		Qgs	-	0.82	-	
Gate-Drain Charge		Qgd	-	0.59	-	

6.ELECTRICAL CHARACTERISTICS CURVES

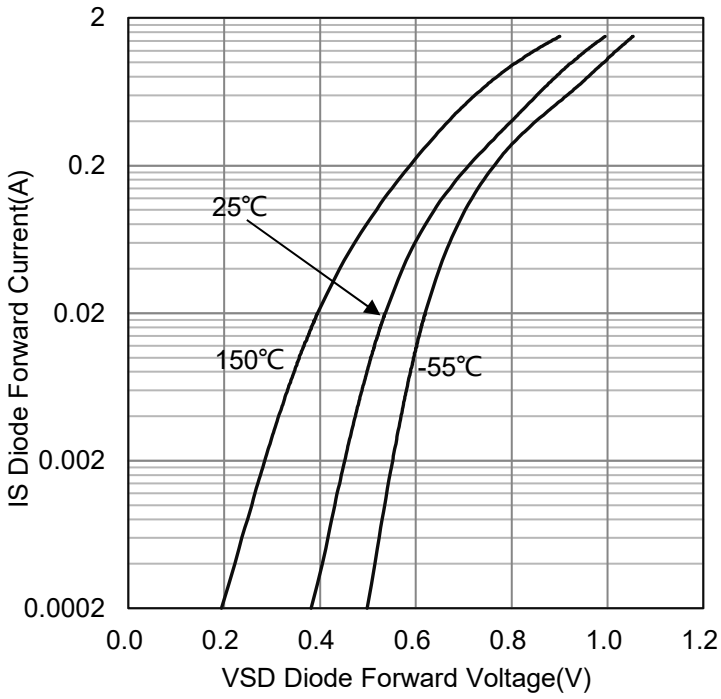
N-MOSFET



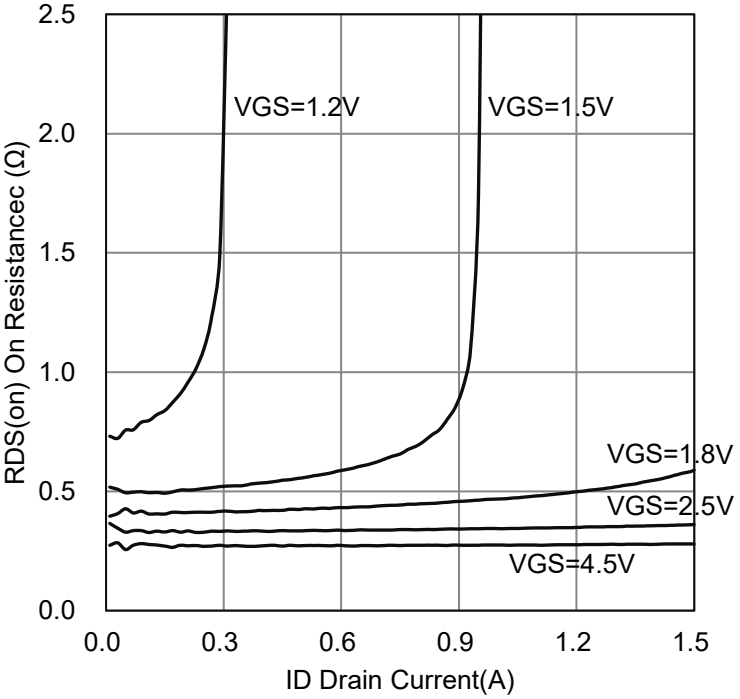
ID vs. VDS



ID vs. VGS



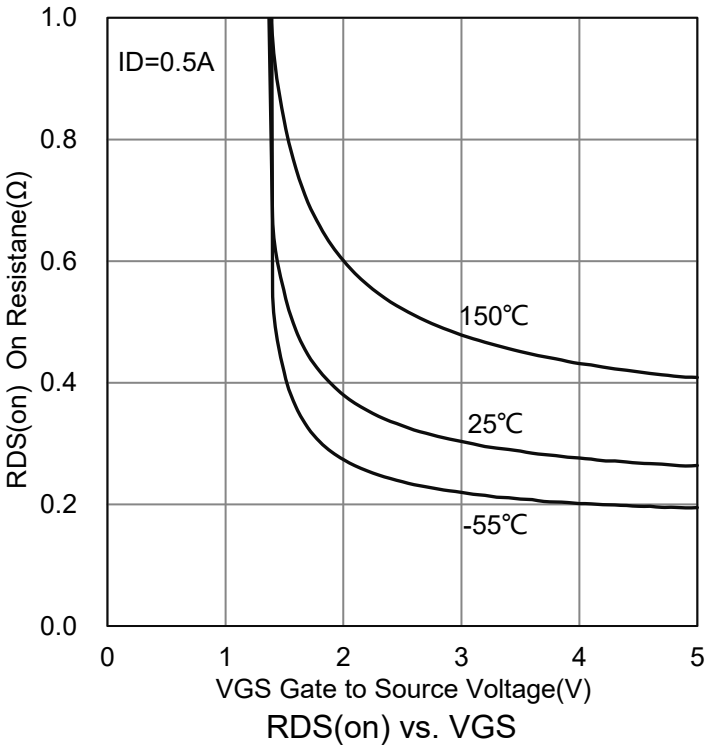
IS vs. VSD



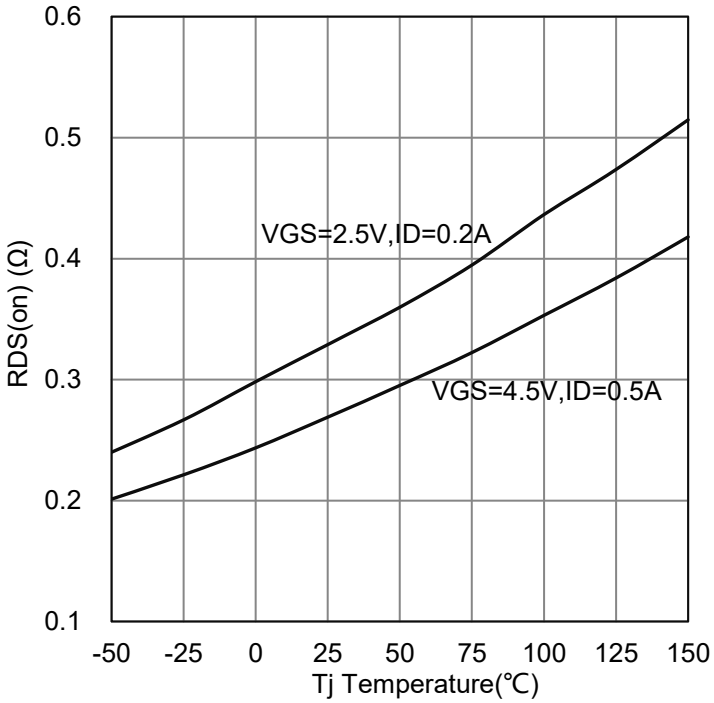
RDS(on) vs. ID

6.ELECTRICAL CHARACTERISTICS CURVES(Con.)

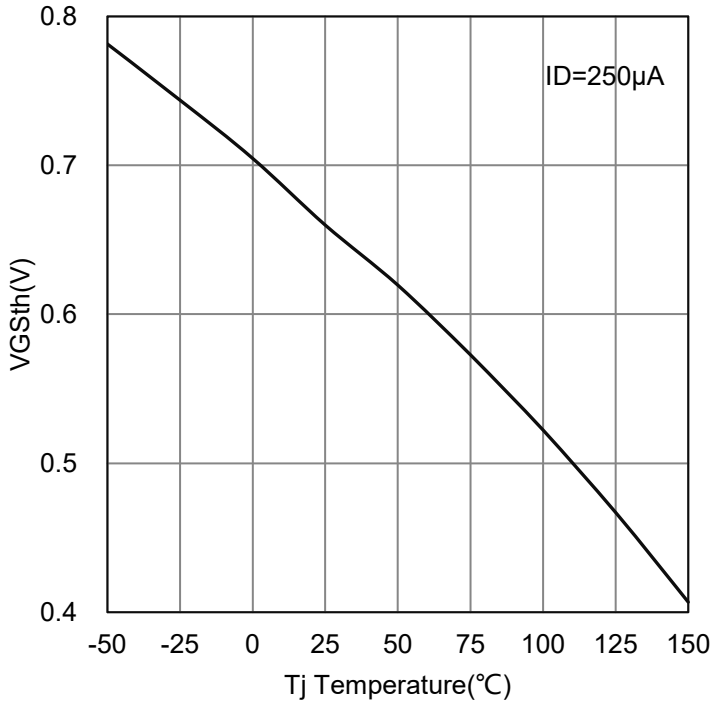
N-MOSFET



RDS(on) vs. VGS



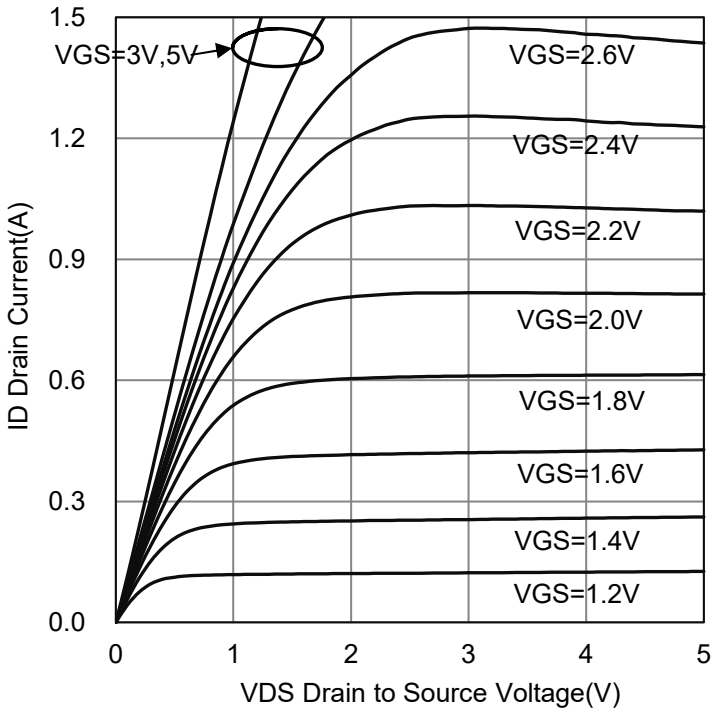
RDS(on) vs. Tj



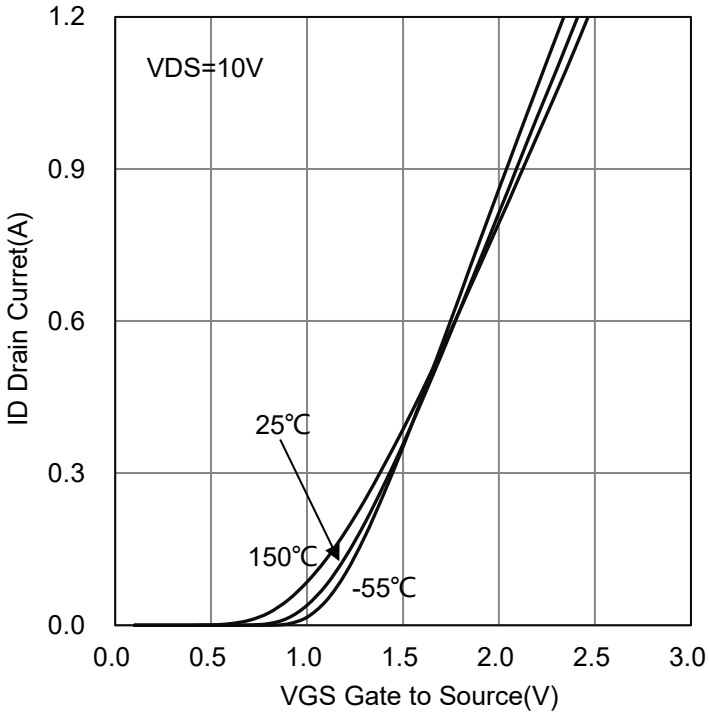
VGSth vs. Tj

6.ELECTRICAL CHARACTERISTICS CURVES(Con.)

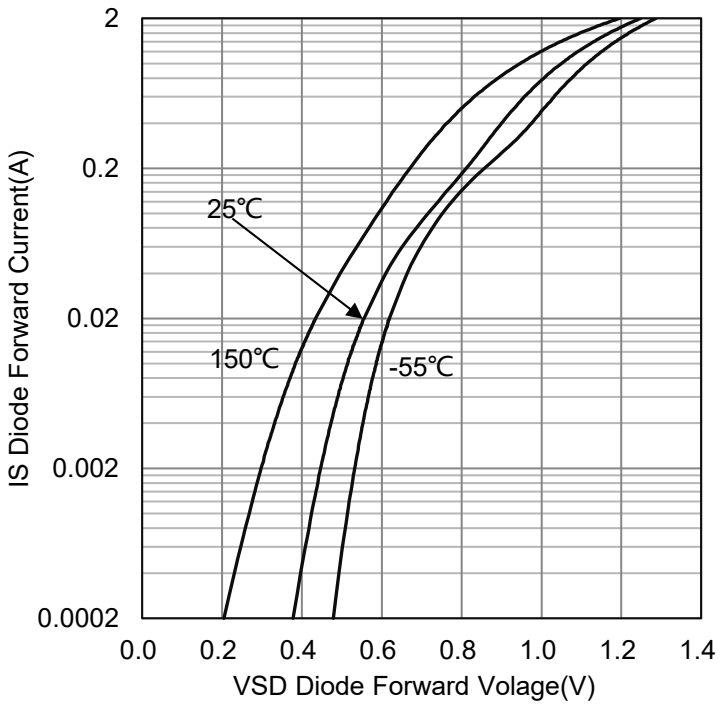
P-MOSFET



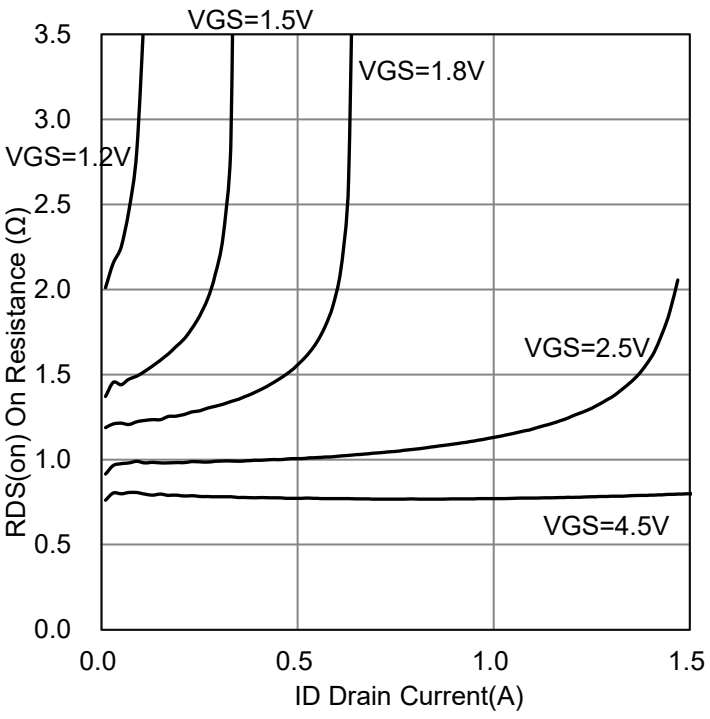
ID vs. VDS



ID vs. VGS



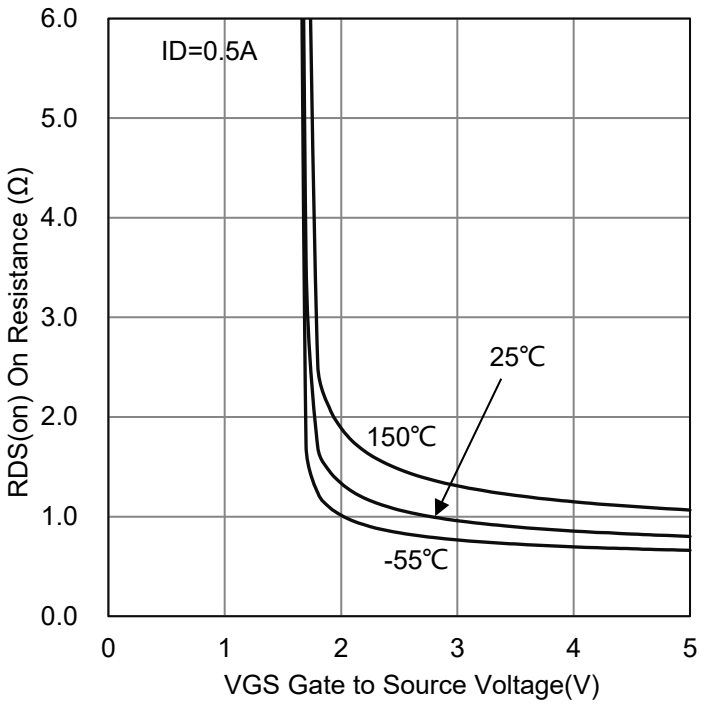
IS vs. VSD



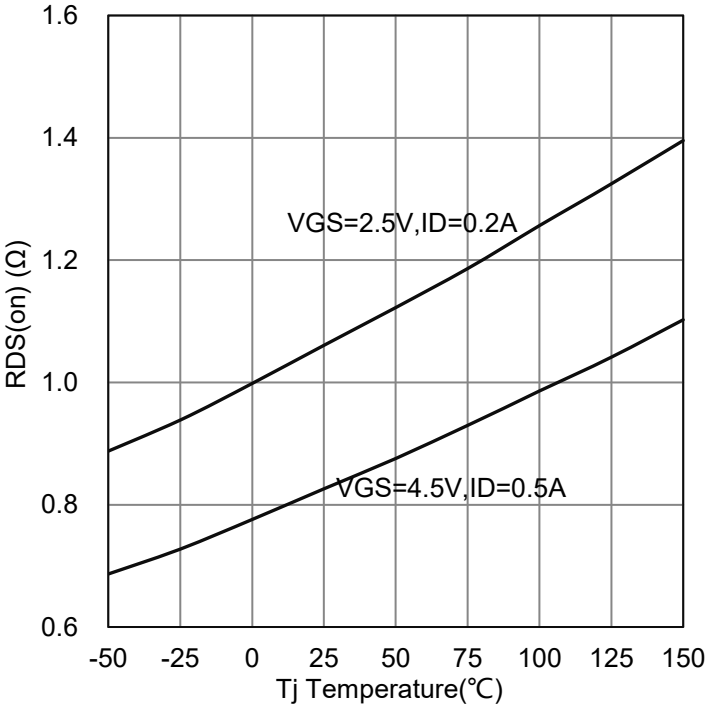
RDS(on) vs. ID

6.ELECTRICAL CHARACTERISTICS CURVES(Con.)

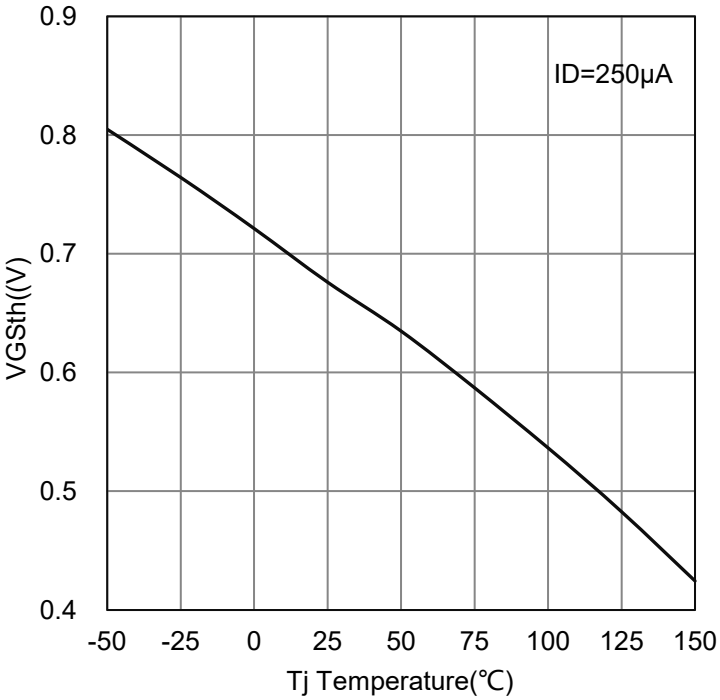
P-MOSFET



RDS(on) vs. VGS

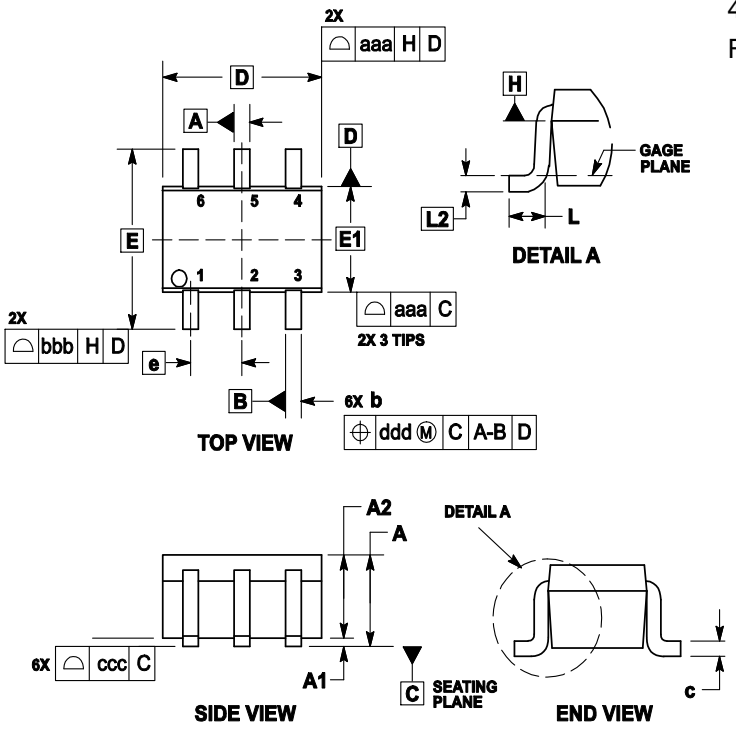


RDS(on) vs. Tj



VGSth vs. Tj

7.OUTLINE AND DIMENSIONS



Notes:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS.

	MILLIMETERS			INCHES		
DIM	MIN	NOM	MAX	MIN	NOM	MAX
A	---	---	1.10	---	---	0.043
A1	0.00	---	0.10	0	---	0.004
A2	0.70	0.90	1.00	0.027	0.035	0.039
b	0.15	0.20	0.25	0.006	0.008	0.01
C	0.08	0.15	0.22	0.003	0.006	0.009
D	1.80	2.00	2.20	0.07	0.078	0.086
E	2.00	2.10	2.20	0.078	0.082	0.086
E1	1.15	1.25	1.35	0.045	0.049	0.053
e	0.65 BSC			0.026 BSC		
L	0.26	0.36	0.46	0.010	0.014	0.018
L2	0.15 BSC			0.006 BSC		
aaa	0.15			0.01		
bbb	0.30			0.01		
ccc	0.10			0.00		
ddd	0.10			0.00		

8.SOLDERING FOOTPRINT