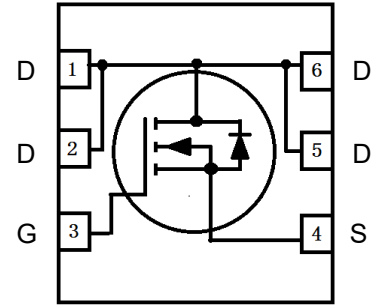
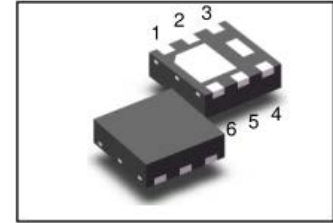


# N2604D

## 60V N-Channel Enhancement MOSFET



### 1. FEATURES

- $V_{DS} = 60\text{ V}$   
 $R_{DS(ON)} \leq 35\text{ m}\Omega, V_{GS@10V}, I_{DS@5A}$   
 $R_{DS(ON)} \leq 40\text{ m}\Omega, V_{GS@4.5V}, I_{DS@4A}$
- Low  $R_{DS(ON)}$  trench technology
- Low thermal impedance
- Fast switching speed
- We declare that the material of product are Halogen Free and compliance with RoHS requirements.

### 2. APPLICATIONS

- DC/DC Conversion
- Power Routing
- Motor Drives

### 3. ORDERING INFORMATION

Device	Marking	Shipping
N2604D	04D	4000/Tape&Reel

### 4. MAXIMUM RATINGS( $T_a = 25^\circ\text{C}$ unless otherwise stated)

Parameter	Symbol	Limits	Unit
Drain-to-Source Voltage	$V_{DSS}$	60	V
Gate-to-Source Voltage	$V_{GS}$	$\pm 20$	V
Avalanche Current	$I_{AS}$	10	A
Avalanche energy $L=0.1\text{mH}$	$E_{AS}$	5	mJ
Continuous Drain Current(Note 1)	$I_D$	$T_A = 25^\circ\text{C}$	7
		$T_A = 70^\circ\text{C}$	4
Pulsed Drain Current (Note 2)	$I_{DM}$	28	A
Power Dissipation(Note 1)	$P_D$	$T_A = 25^\circ\text{C}$	2
		$T_A = 70^\circ\text{C}$	1.5
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	$-55 \sim +150$	$^\circ\text{C}$

### 5. THERMAL CHARACTERISTICS

Parameter	Symbol	Value	Unit
Junction-to-Ambient(Note 3)	$R_{\theta JA}$	60	$^\circ\text{C/W}$
Junction-to-Case	$R_{\theta JC}$	20	$^\circ\text{C/W}$

- 1.Surface mounted on "1.5 x 1.5" FR4 board using 1 sq in pad, 2 oz Cu.
- 2.Pulse width limited by maximum junction temperature.



**6. ELECTRICAL CHARACTERISTICS**

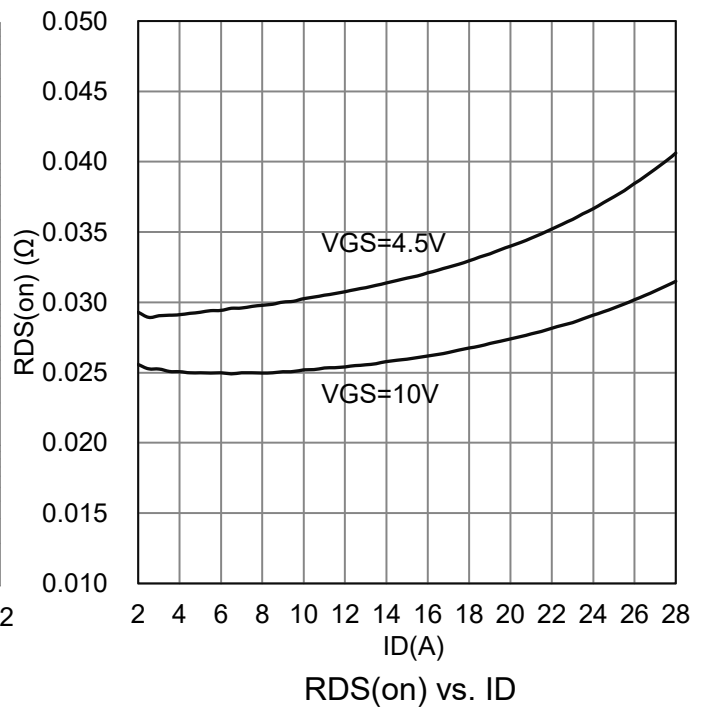
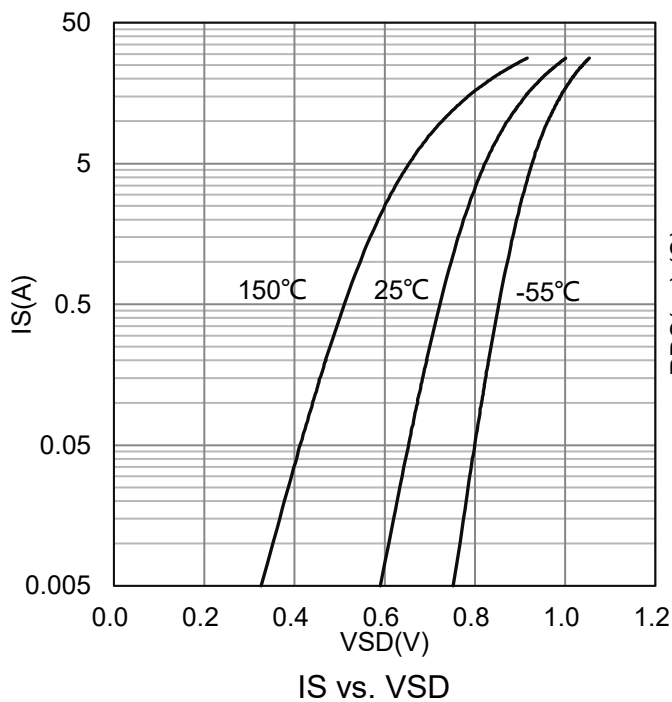
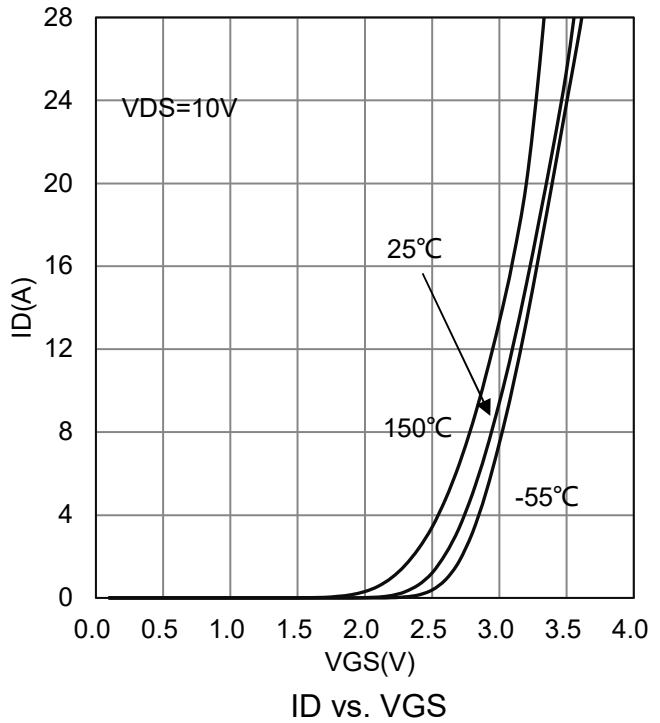
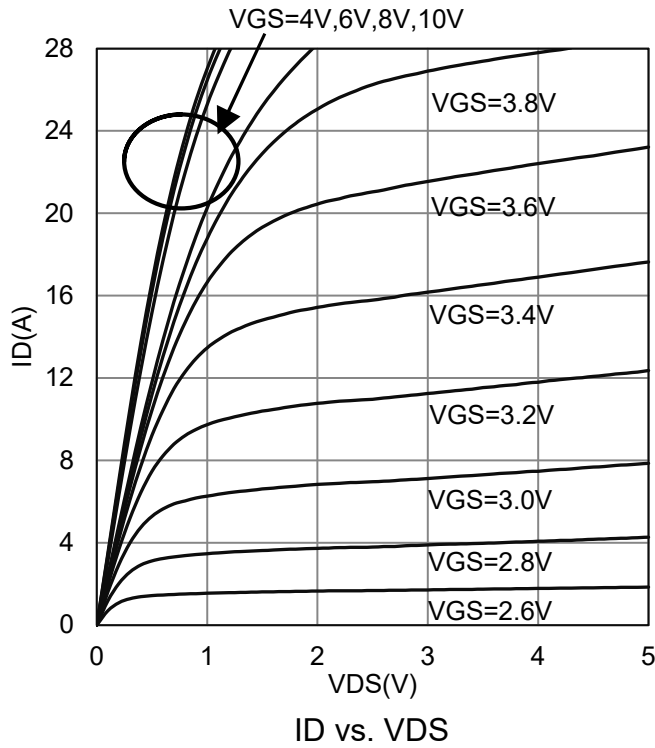
Characteristic	Symbol	Min.	Typ.	Max.	Unit
Static					
Drain-Source Breakdown Voltage (VGS = 0, ID = 250μA)	V(BR)DSS	60	-	-	V
Gate-Source Threshold Voltage (VDS = VGS, ID = 250μA)	VGS(th)	1	1.9	3	V
Gate-Body Leakage (VDS = 0 V, VGS = ±20 V)	IGSS	-	-	±10	μA
Zero Gate Voltage Drain Current (VDS = 48 V, VGS = 0 V)	IDSS	-	-	1	μA
Drain-Source On-Resistance(Note 3) (VGS = 10 V, ID = 7 A) (VGS = 4.5 V, ID = 5 A)	RDS(on)	-	23 32	35 40	mΩ
Diode Forward Voltage(Note 3) (IS = 1.9 A, VGS = 0 V)	VSD	-	0.78	1.5	V
Dynamic(Note 4)					
Total Gate Charge	(VDS = 15 V, VGS = 4.5 V, ID = 6 A)	Qg	-	9	nC
Gate-Source Charge		Qgs	-	3.2	
Gate-Drain Charge		Qgd	-	3	
Turn-On Delay Time	(VDS = 15 V, RL=1.4 Ω, ID =6 A, VGEN = 10 V, RGEN = 6 Ω)	td(on)	-	6	ns
Rise Time		tr	-	6	
Turn-Off Delay Time		td(off)	-	33	
Fall Time		tf	-	11	
Input Capacitance	(VDS = 15 V, VGS = 0 V, f = 1 Mhz)	Ciss	-	1280	pF
Output Capacitance		Coss	-	65	
Reverse Transfer Capacitance		Crss	-	53	
Gate Resistance (VDS=0V, VGS=0V, f=1.0MHz)	Rg	-	0.74	-	Ω

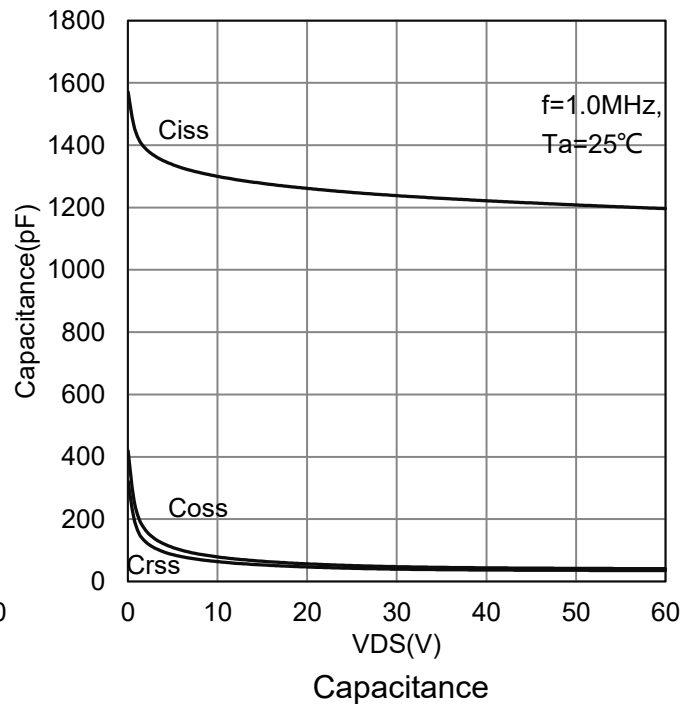
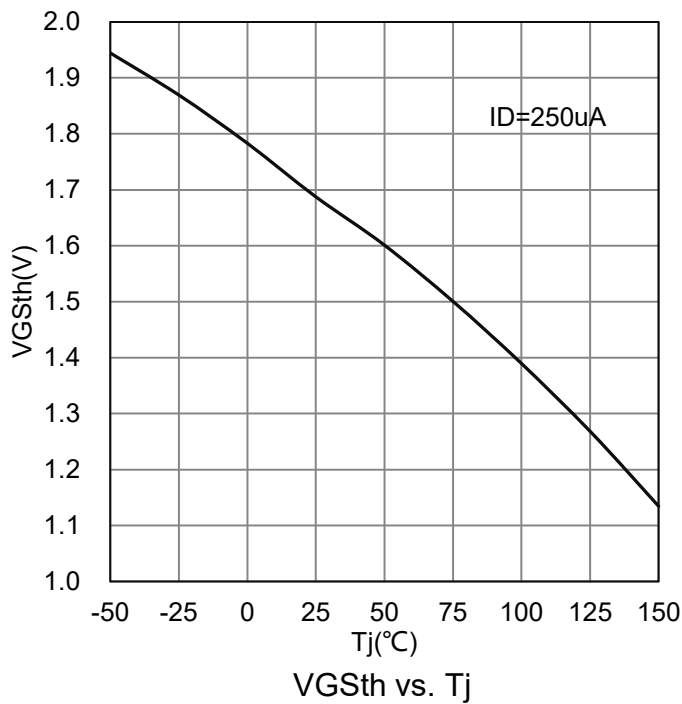
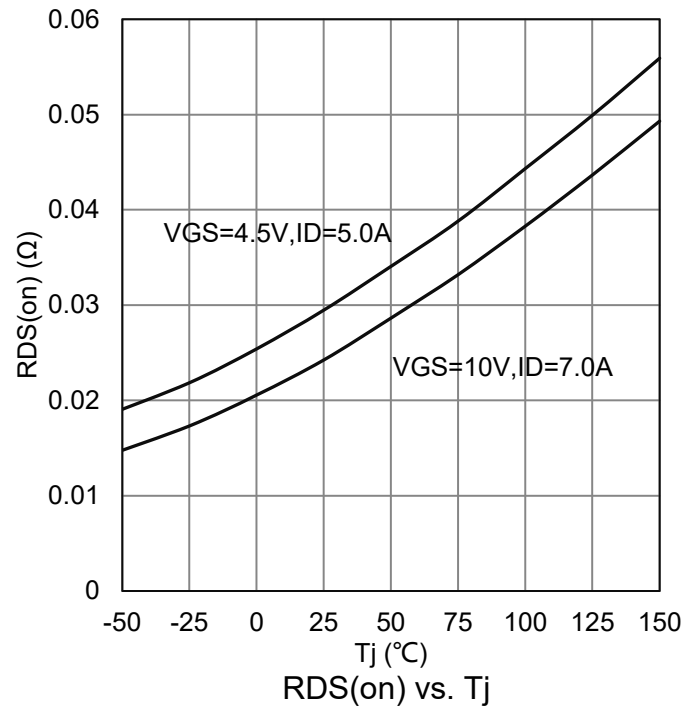
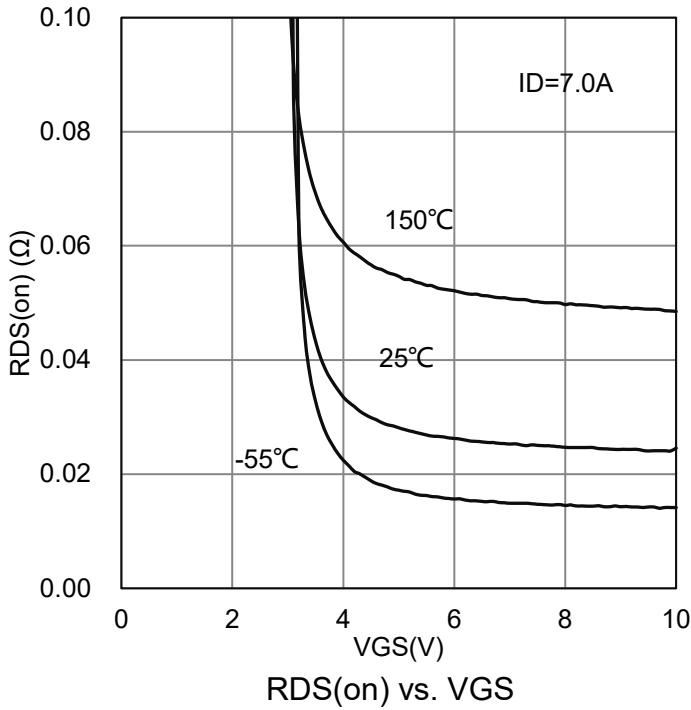
3. Pulse test: PW ≤ 300us duty cycle ≤ 2%.

4. Guaranteed by design, not subject to production testing.

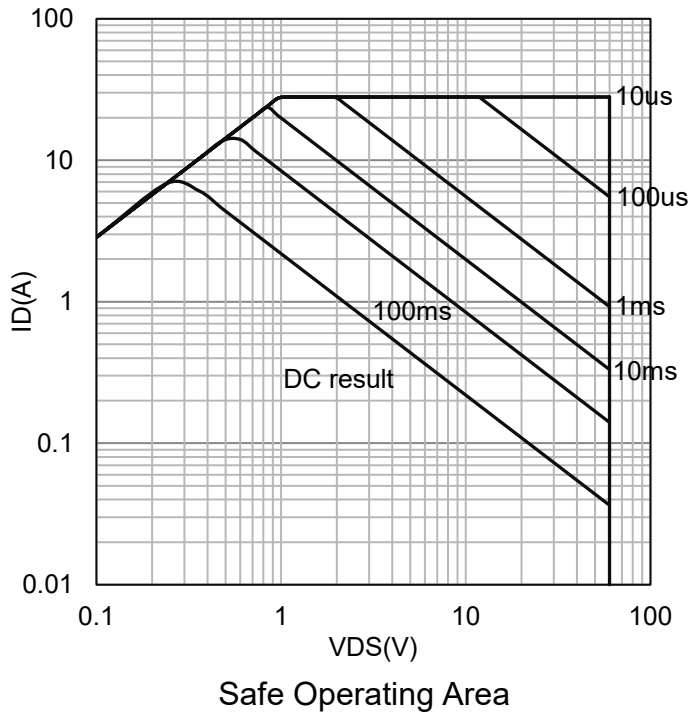


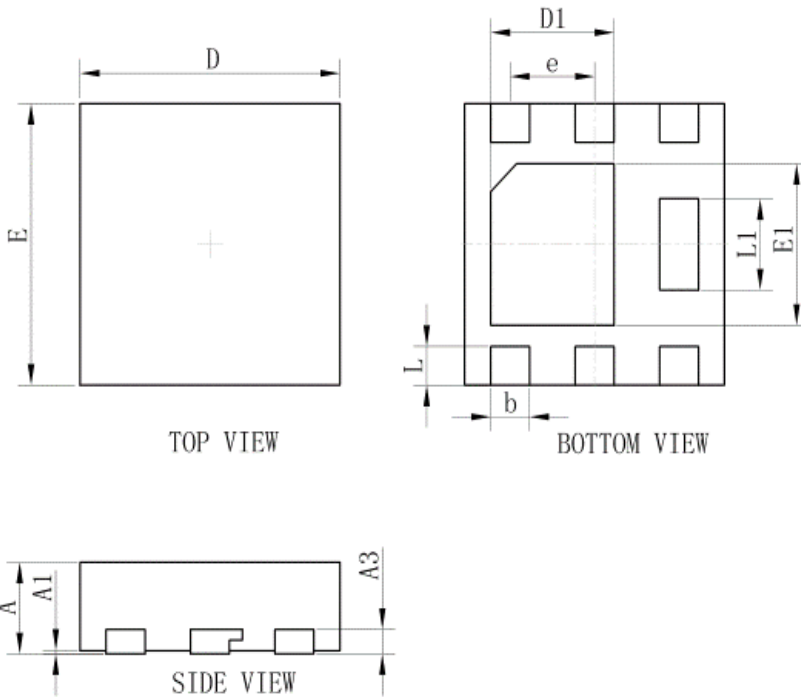
7.ELECTRICAL CHARACTERISTICS CURVES



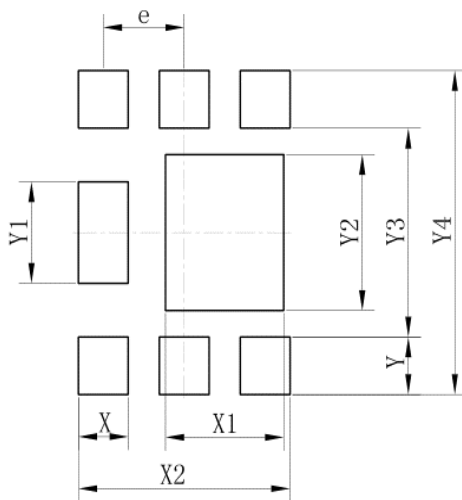
**7.ELECTRICAL CHARACTERISTICS CURVES(Con.)**


**7.ELECTRICAL CHARACTERISTICS CURVES(Con.)**



**8. OUTLINE AND DIMENSIONS**


DFN2020-6S			
DIM	MIN	NOR	MAX
A	0.60	0.65	0.70
A1	0.01	0.03	0.05
b	0.25	0.30	0.35
D	1.95	2.00	2.05
E	1.95	2.00	2.05
e	0.65TYP.		
L	0.23	0.28	0.33
L1	0.60	0.65	0.65
D1	0.90	0.95	1.00
E1	1.10	1.15	1.20
A3	0.152REF		
All Dimensions in mm			

**9. SOLDERING FOOTPRINT**


DFN2020-6S	
Dim	(mm)
X	0.40
X1	0.95
X2	1.70
e	0.65
Y	0.43
Y1	0.75
Y2	1.15
Y3	1.54
Y4	2.39

