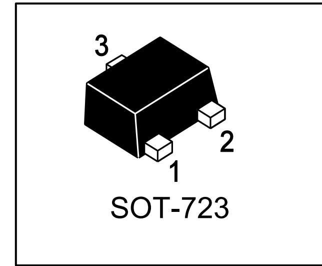
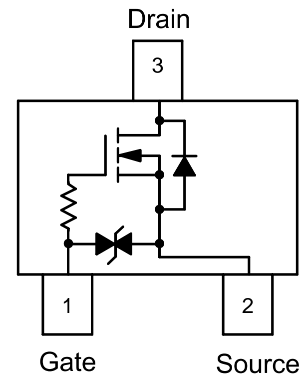
NTK3043N
S-NTK3043N

20 V, 285 mA, N−Channel Power MOSFET





1. FEATURES

- Enables High Density PCB Manufacturing
- 44% Smaller Footprint than SC−89 and 38% Thinner than SC−89
- Low Voltage Drive Makes this Device Ideal for Portable Equipment
- Low Threshold Levels, VGS(TH) < 1.3 V
- Low Profile (< 0.5 mm) Allows It to Fit Easily into Extremely Thin Environments such as Portable Electronics
- Operated at Standard Logic Level Gate Drive, Facilitating Future Migration to Lower Levels Using the Same Basic Topology
- These are Pb−Free Devices
- 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
NTK3043N	KA	8000/Tape&Reel

3. MAXIMUM RATINGS(Ta = 25ºC)

Parameter			Symbol	Limits	Unit
Drain−to−Source Voltage			VDSS	20	V
Gate−to−Source Voltage			VGS	±10	V
Continuous Drain Current (Note 1)	Steady State	TA = 25°C	ID	255	mA
		TA = 85°C		185	
	t ≤5 s	TA = 25°C		285	
Power Dissipation(Note 1)	Steady State	TA = 25°C	PD	440	mW
	t ≤5 s			545	
Continuous Drain Current (Note 2)	Steady State	TA = 25°C	ID	210	mA
		TA = 85°C		155	
Power Dissipation(Note 2)		TA = 25°C	PD	310	mW
Pulsed Drain Current(tp = 10 μs)			IDM	400	mA
Source Current (Body Diode) (Note 2)			IS	286	mA
Operating Junction and Storage Temperature			TJ,Tstg	−55~+150	° C
Lead Temperature for Soldering Purposes (1/8 " from case for 10 s)			TL	260	° C

4. THERMAL CHARACTERISTICS

Parameter		Symbol	Limits	Unit
Thermal Resistance-Junction to Ambient	Steady State(Note 1)	RΘJA	280	ºC/W
	t = 5 s(Note 1)		228	
	Steady State(Note 2)		400	

1.Surface−mounted on FR4 board using 1 in sq pad size (Cu area = 1.127 in sq [1 oz] including traces)

2.Surface−mounted on FR4 board using the minimum recommended pad size.

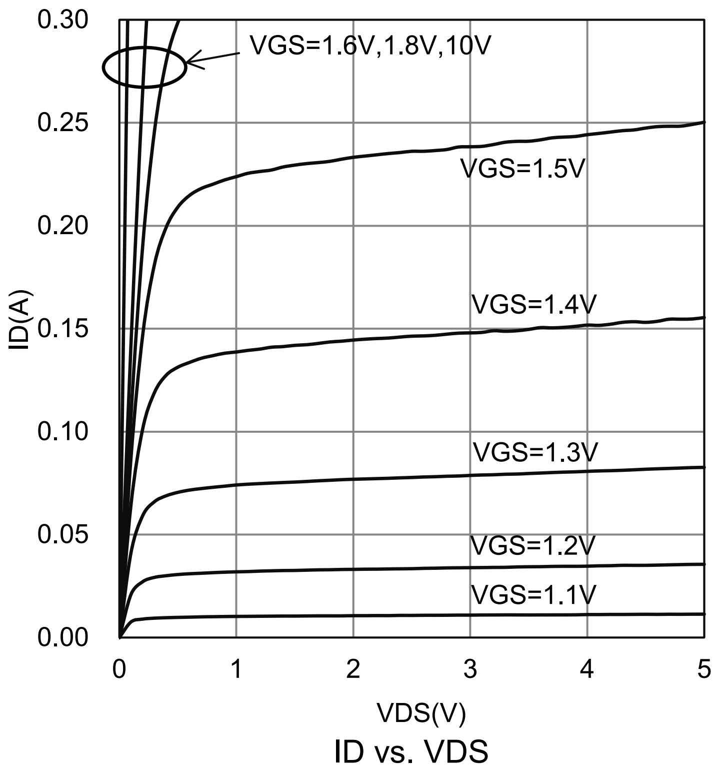
5. ELECTRICAL CHARACTERISTICS (Ta= 25ºC)

Characteristic	Condition	Symbol	Min.	Typ.	Max.	Unit
Static						
Drain–Source Breakdown Voltage (VGS = 0, ID = 100μA)		VBRDSS	20	-	-	V
Drain−to−Source Breakdown Voltage Temperature Coefficient		VBRDSS/TJ	-	27	-	mV/º C
Zero Gate Voltage Drain Current	(VGS = 0, VDS = 16 V,TJ = 25°C)	IDSS	-	-	1	μA
	(VGS = 0, VDS = 16 V,TJ = 125°C)		-	-	10	
Gate–Body Leakage Current (VDS = 0 V, VGS = ±5 V)		IGSS	-	-	±1	μA
Gate Threshold Voltage (VDS = VGS, ID = 250μA)		VGS(th)	0.4	-	1.3	V
Gate Threshold Temperature Coefficient		VGS(TH)/TJ	-	-2.4	-	mV/º C
Static Drain–Source On–State Resistance	(VGS = 4.5V, ID = 10 mA)	RDS(on)	-	1.5	3.4	Ω
	(VGS = 4.5V, ID = 255 mA)		-	1.6	3.8	
	(VGS = 2.5 V, ID = 1 mA)		-	2.4	4.5	
	(VGS = 1.8 V, ID = 1 mA)		-	5.1	10	
	(VGS = 1.65 V, ID = 1 mA)		-	6.8	15	
Forward Transconductance (VDS = 5.0 V, ID = 100 mA)		gfs	-	0.275	-	S
DYNAMIC						
Input Capacitance	(VGS=0 V, f=1 MHz, VDS=10 V)	Ciss	-	11	-	pF
Output Capacitance		Coss	-	8.3	-	
Reverse Transfer Capacitance		Crss	-	2.7	-	
Turn-On Delay Time	(VGS = 4.5 V, VDD = 5 V, ID = 10 mA,RG = 6Ω)	td(on)	-	13	-	ns
Rise Time		tr	-	15	-	
Turn-Off Delay Time		td(off)	-	94	-	
Fall Time		tf	-	55	-	
Diode Forward Voltage (VGS = 0 V, IS = 286 mA)	TJ = 25°C	VSD	-	0.83	1.2	V
	TJ = 125°C		-	0.69	-	
Reverse Recovery Time	(VGS=0 V,VDD =20 V, dISD/dt=100 A/ μs,IS=286 mA)	tRR	-	9.1	-	ns
Charge Time		ta	-	7.1	-	
Discharge Time		tb	-	2.0	-	
Reverse Recovery Charge		QRR	-	3.7	-	nC

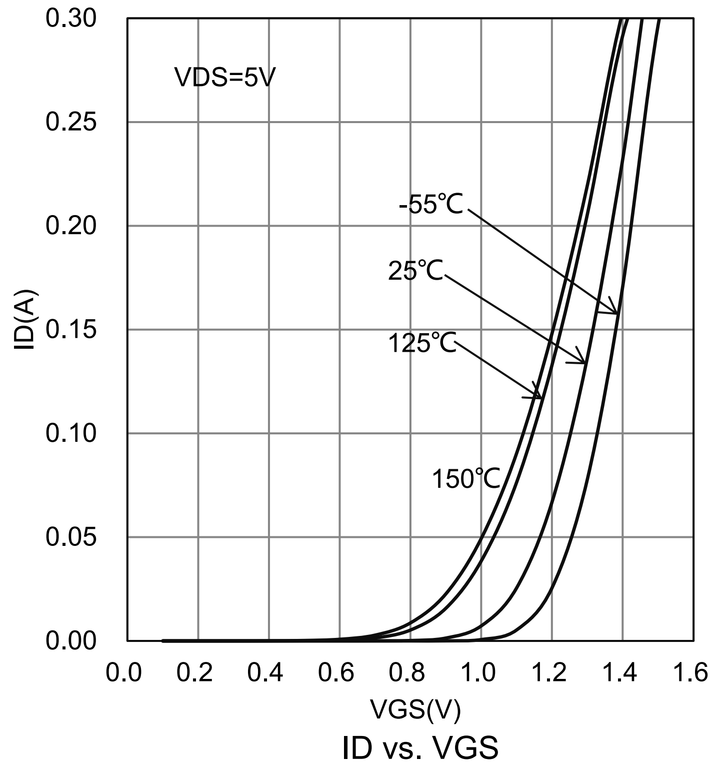
3.Pulse Test: Pulse Width ≤300 μs, Duty Cycle ≤2.0%.

4.Switching characteristics are independent of operating junction temperatures

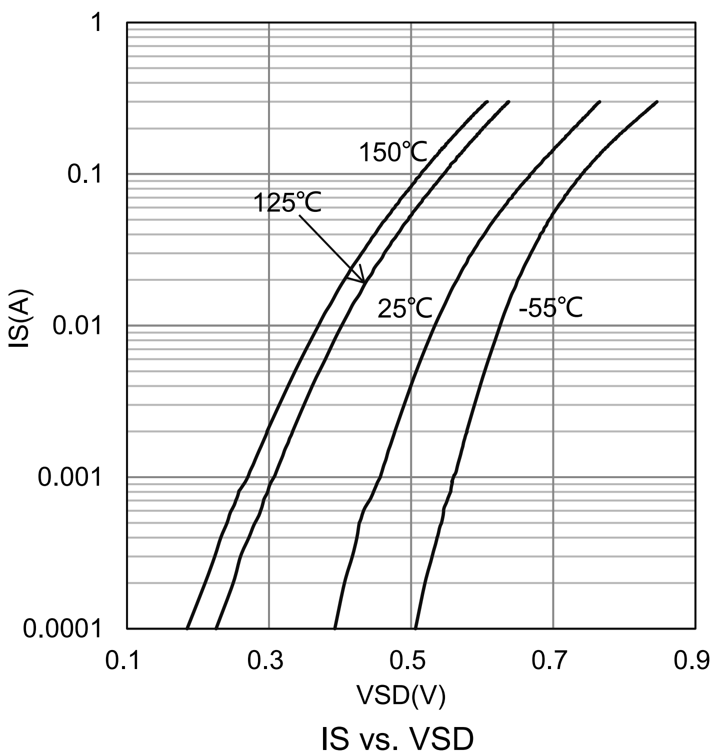
6.ELECTRICAL CHARACTERISTICS CURVES



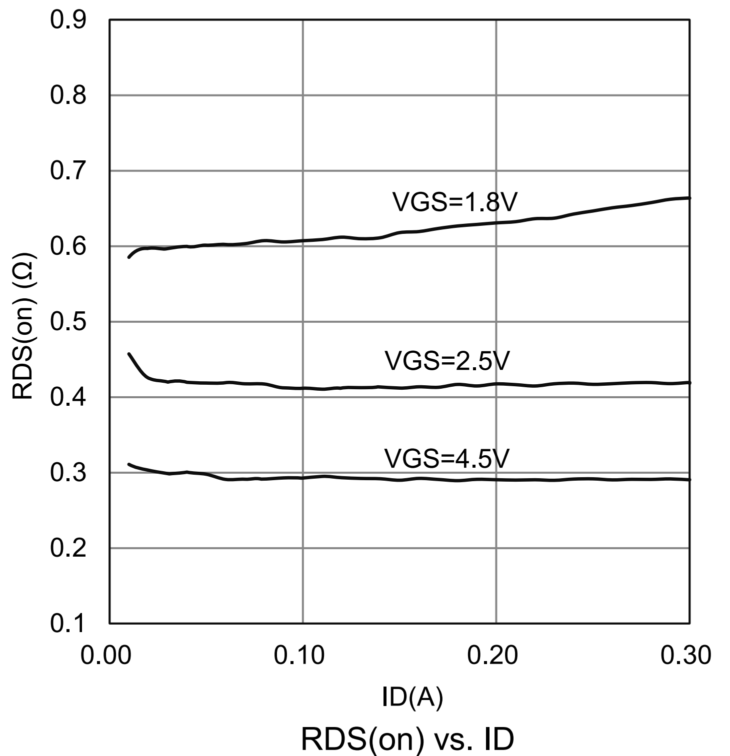
ID vs. VDS



ID vs. VGS

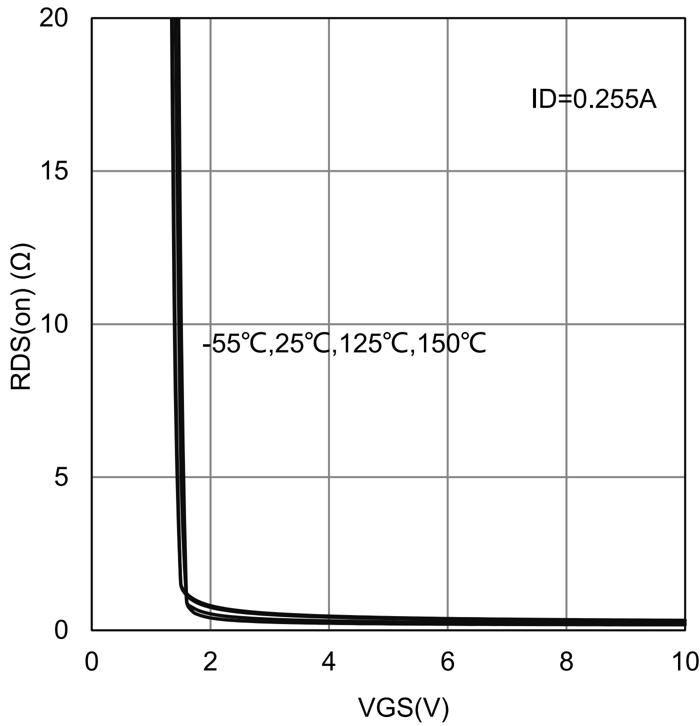


IS vs. VSD

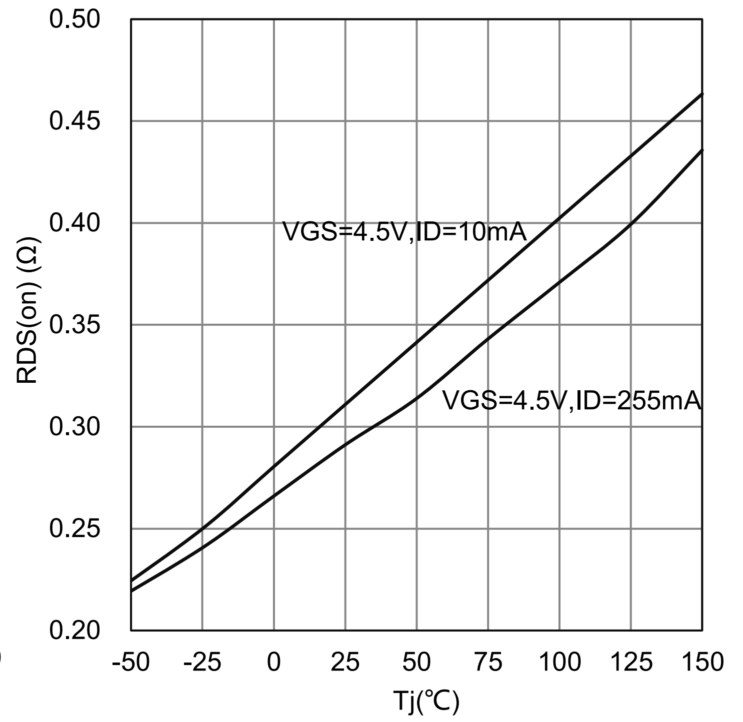


RDS(on) vs. ID

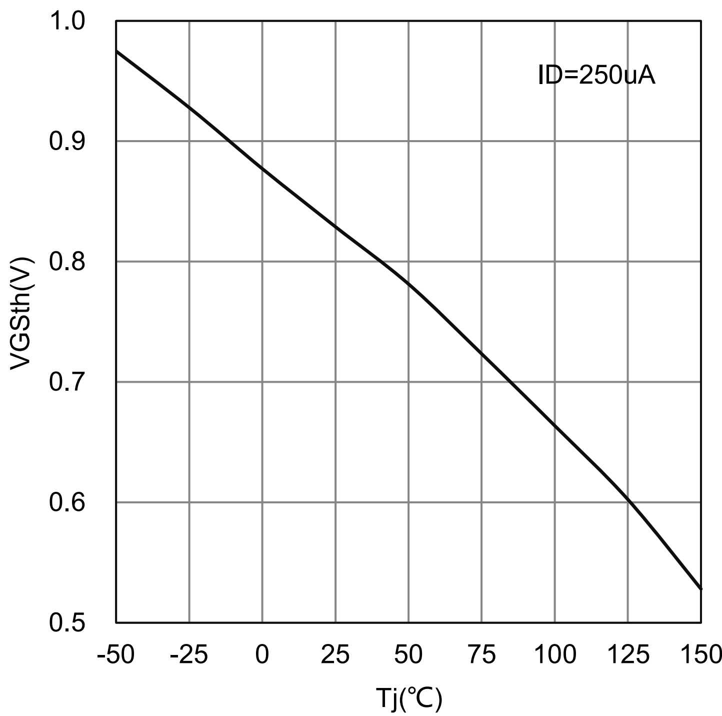
6.ELECTRICAL CHARACTERISTICS CURVES(Con.)



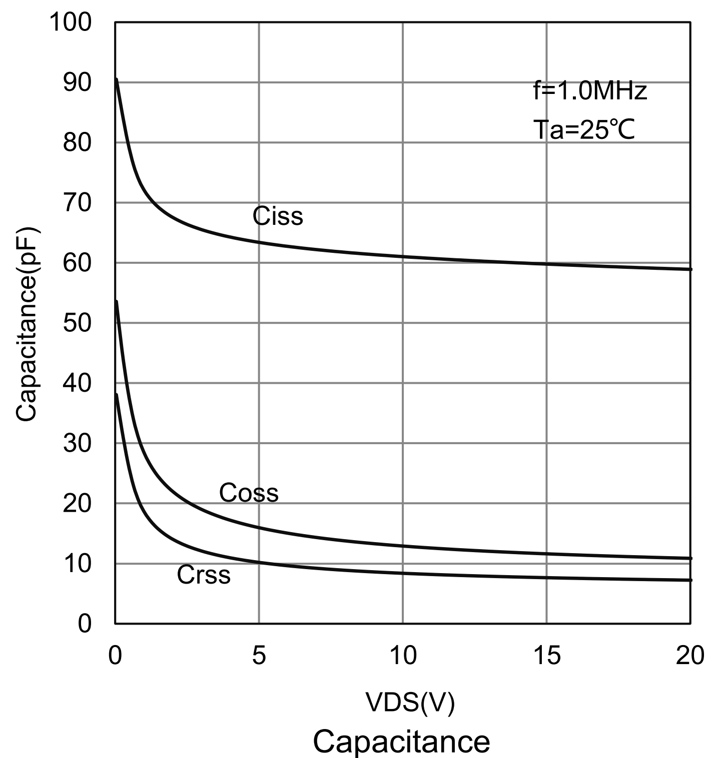
RDS(on) vs. VGS



RDS(on) vs. Tj

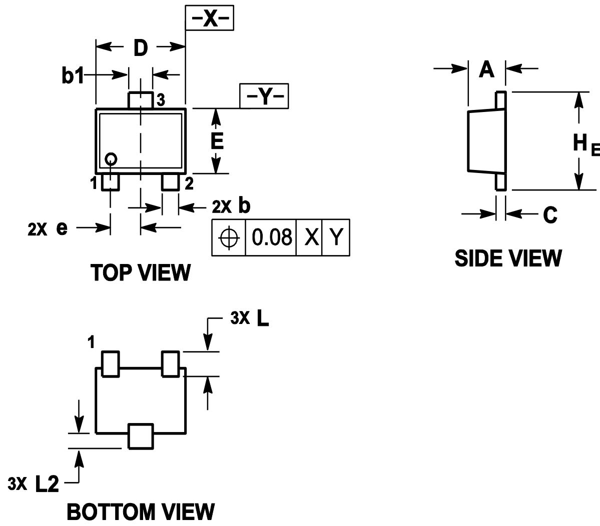


VGSth vs. Tj



Capacitance

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.

DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.45	0.50	0.55	0.018	0.020	0.039
b	0.15	0.21	0.27	0.006	0.008	0.011
b1	0.25	0.31	0.37	0.010	0.012	0.015
C	0.07	0.12	0.17	0.003	0.005	0.007
D	1.15	1.20	1.25	0.045	0.047	0.049
E	0.75	0.80	0.85	0.030	0.031	0.033
e	0.40REF			0.016REF		
H_E	1.15	1.20	1.25	0.045	0.047	0.049
L	0.29REF			0.011REF		
L_2	0.15	0.20	0.25	0.006	0.008	0.010

8.SOLDERING FOOTPRINT