N-CHANNEL ENHANCEMENT MODE POWER MOSFET

MTNN18N03Q8

	N-CH 1	N-CH 2
BV_{DSS}	30V	60V
I_D	10A	0.115A
$R_{DSON(MAX)}$	18mΩ	5Ω

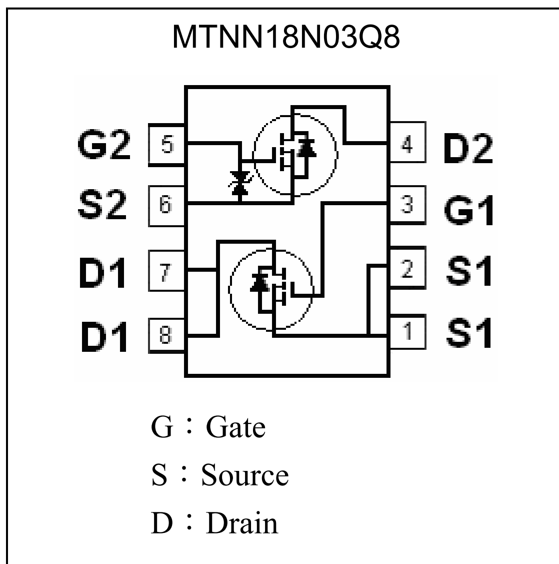
Description

The MTNN18N03Q8 provides the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost effectiveness.
The SOP-8 package is universally preferred for all commercial-industrial surface mount applications and suited for low voltage applications such as DC/DC converters.

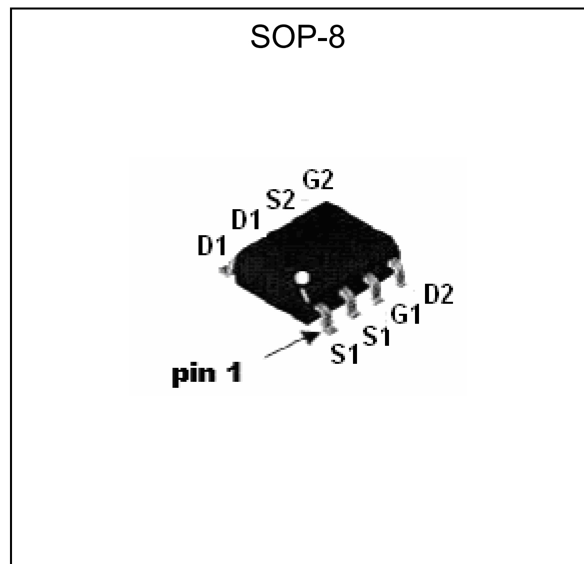
Features

- Simple drive requirement
- Low on-resistance
- Fast switching speed
- Two N-ch MOSFETs in a package
- Pb-free lead plating package

Equivalent Circuit



Outline



Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits		Unit
		N-CH 1	N-CH 2	
Drain-Source Voltage	V_{DS}	30	60	V
Gate-Source Voltage	V_{GS}	±20	±20	V
Continuous Drain Current @ T_C=25 °C (Note 1)	I_D	10	0.115	A
Continuous Drain Current @ T_C=100 °C (Note 1)	I_D	7	0.08	A
Pulsed Drain Current (Note 2&3)	I_{DM}	40	0.7	A
Total Power Dissipation @ T_A=25 °C	Pd	2	0.4	W
Linear Derating Factor		0.016	0.016	W / °C
ESD susceptibility (Note 4)			1250	V
Operating Junction Temperature	Tj	-55~+150		°C
Storage Temperature	Tstg	-55~+150		°C
Thermal Resistance, Junction-to-Ambient (Note 1)	Rth,ja	62.5		°C/W

Note : 1. Surface mounted on 1 in² copper pad of FR-4 board; 135°C/W when mounted on minimum copper pad.
2. Pulse width limited by maximum junction temperature.
3. Pulse width≤300μs, duty cycle≤2%.
4. Human body model, 1.5kΩ in series with 100pF.

Characteristics (Tj=25°C, unless otherwise specified)

N-Channel MOSFET 1

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	30	-	-	V	V_{GS}=0, ID=250μA
$V_{GS(th)}$	1.0	-	3.0	V	V_{DS} = V_{GS}, I_D=250μA
I_{GSS}	-	-	±100	nA	V_{GS}=±20
I_{DSS}	-	-	1	μA	V_{DS} =30V, V_{GS} =0
	-	-	25		V_{DS} =24V, V_{GS} =0, Tj=125°C
*$R_{DS(ON)}$	-	12	18	mΩ	V_{GS} =10V, I_D=10A
	-	17	20		V_{GS} =4.5V, I_D=8A
Dynamic					
*Qg(V_{GS}=10V)	-	19	-	nC	I_D=10A, V_{DS}=15V, V_{GS}=4.5V
*Qg(V_{GS}=4.5V)	-	9.4	-		
*Qgs	-	4.2	-		
*Qgd	-	3.8	-		
*td(ON)	-	15	-	ns	V_{DS}=25V, I_D=1A, V_{GS}=10V, R_G=6Ω, R_L=25Ω
*tr	-	10	-		
*td(OFF)	-	43	-		
*tf	-	7	-		
Ciss	-	731	-	pF	V_{GS}=0V, V_{DS}=15V, f=1MHz
Coss	-	116	-		
Crss	-	36	-		
Rg	-	1	-	Ω	V_{GS}=0V, V_{DS}=0V, f=1MHz

Source-Drain Diode					
*I_S	-	-	2.3	A	
*I_{SM}	-	-	9.2		
*V_{SD}	-	0.7	1.1	V	I_S=2.3A, V_{GS}=0V
*trr	-	50	-	ns	I_F=I_S, V_{GS}=0, dI/dt=100A/μs
*Qrr	-	2	-	nC	

N-Channel MOSFET 2

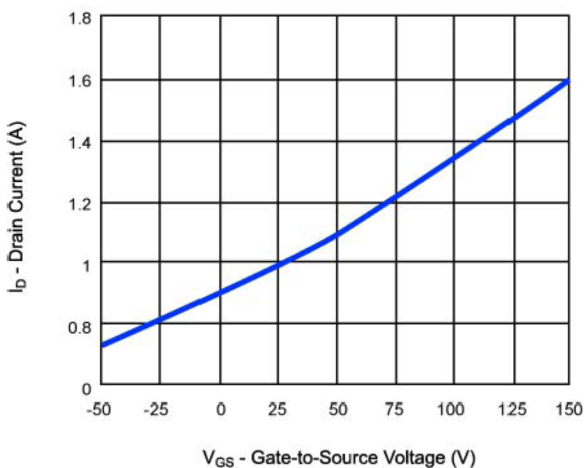
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV_{DSS}*	60	-	-	V	V_{GS}=0, I_D=10μA
$V_{GS(th)}$	1	-	2.5	V	V_{DS}=V_{GS}, I_D=250μA
I_{GSS}	-	-	±10	μA	V_{GS}=±20V, V_{DS}=0
I_{DSS}	-	-	1	μA	V_{DS}=60V, V_{GS}=0
$R_{DS(ON)}$*	-	3.6	5.5	Ω	I_D=100mA, V_{GS}=5V
	-	3	5		I_D=100mA, V_{GS}=10V
G_{FS}	100	-	-	mS	V_{DS}=10V, I_D=100mA
C_{iss}	-	30.5	-	pF	V_{DS}=10V, V_{GS}=0, f=1MHz
C_{oss}	-	9.3	-		
C_{rss}	-	5.9	-		

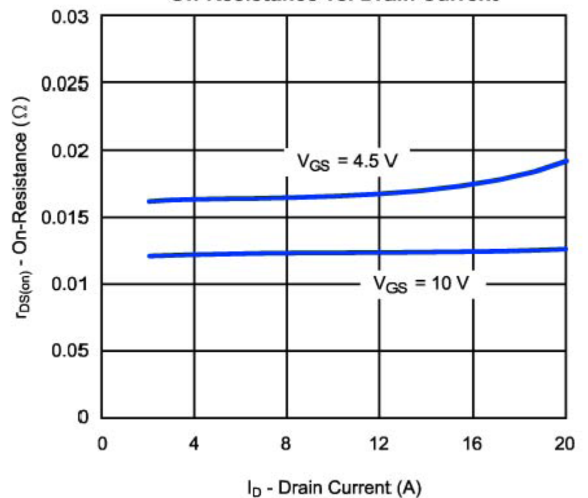
*Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%

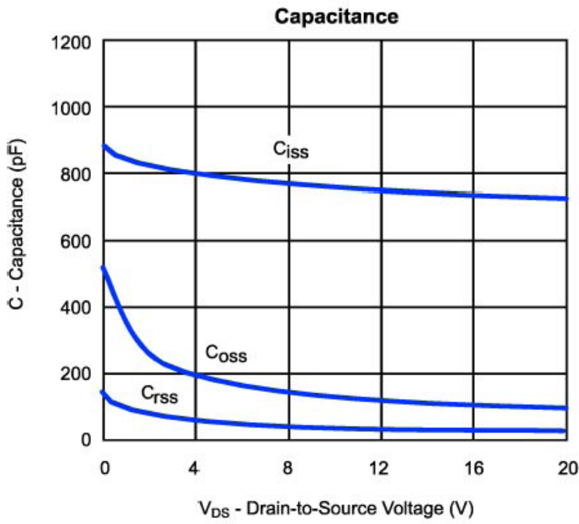
Ordering Information

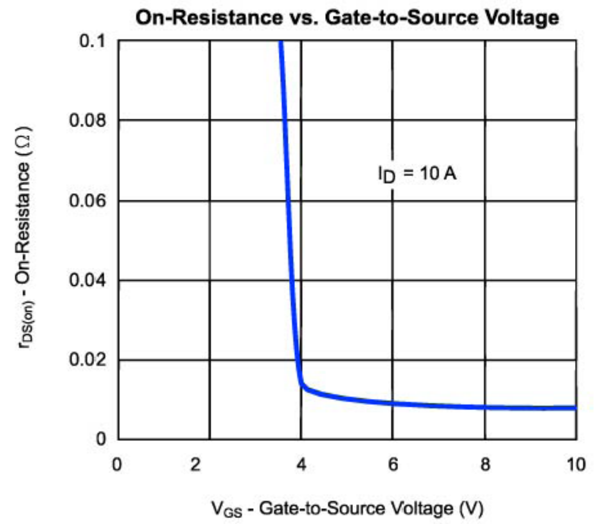
Device	Package	Shipping
MTNN18N03Q8	SOP-8 (Pb-free lead plating package)	3000 pcs / Tape & Reel

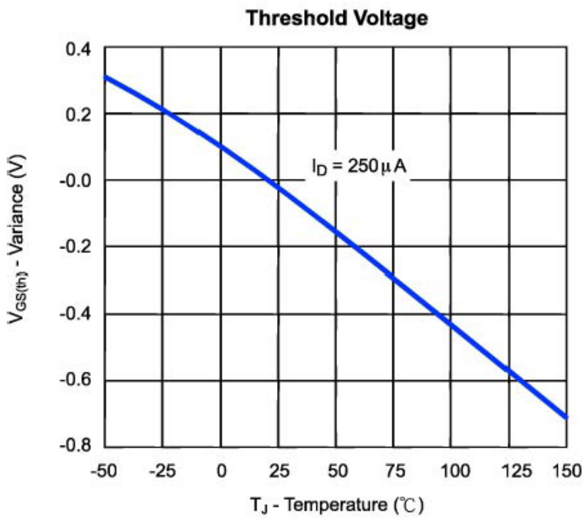
Typical Characteristics
N-CH MOSFET 1

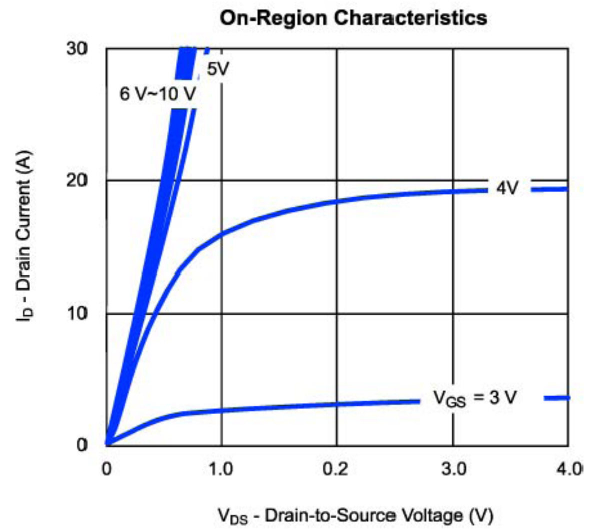


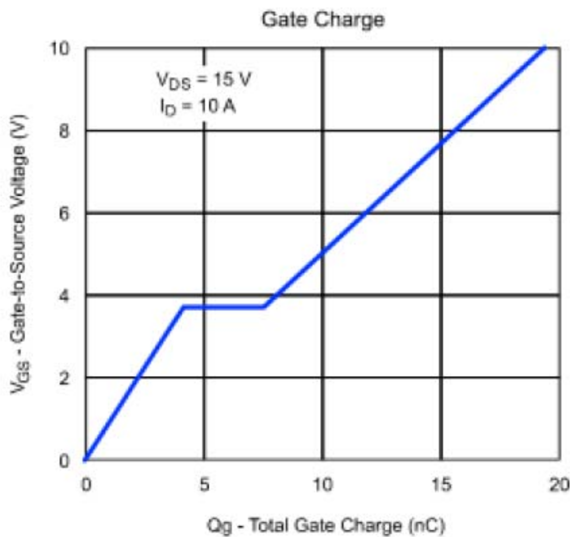


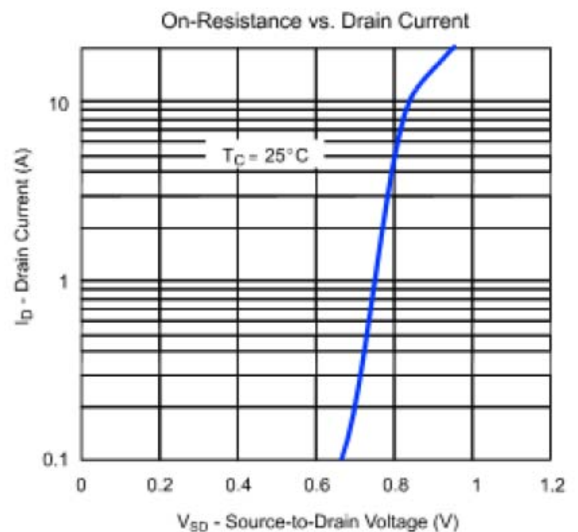

Capacitance
C - Capacitance (pF)
Ciss
Coss
Crss
VDS - Drain-to-Source Voltage (V)


On-Resistance vs. Gate-to-Source Voltage
rDS(on) - On-Resistance (Ω)
ID = 10 A
VGS - Gate-to-Source Voltage (V)

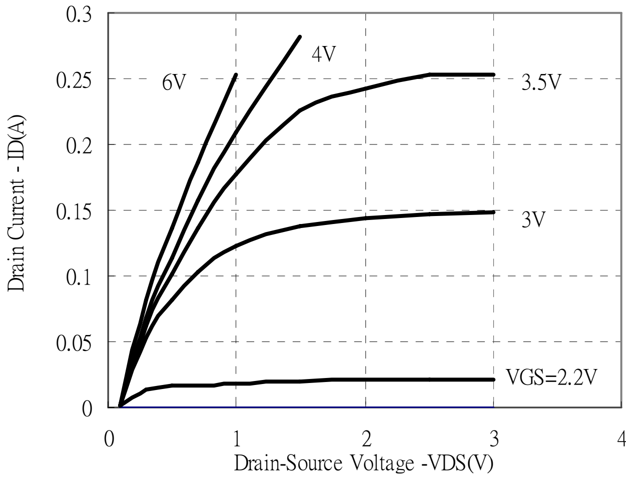

Threshold Voltage
VGS(th) - Variance (V)
ID = 250μA
TJ - Temperature (℃)

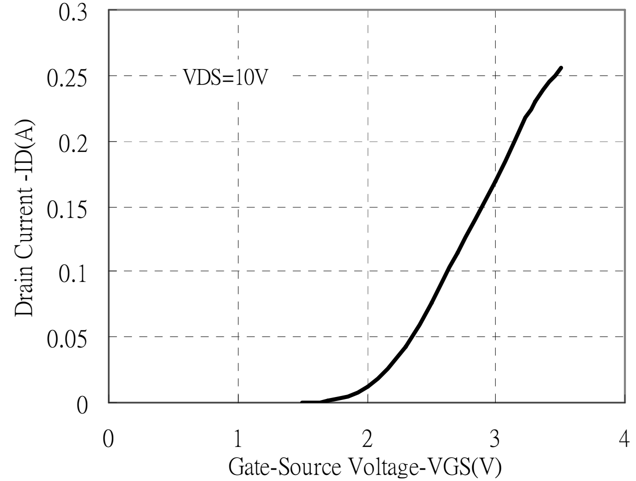

On-Region Characteristics
ID - Drain Current (A)
6 V~10 V
5V
4V
VGS = 3 V
VDS - Drain-to-Source Voltage (V)

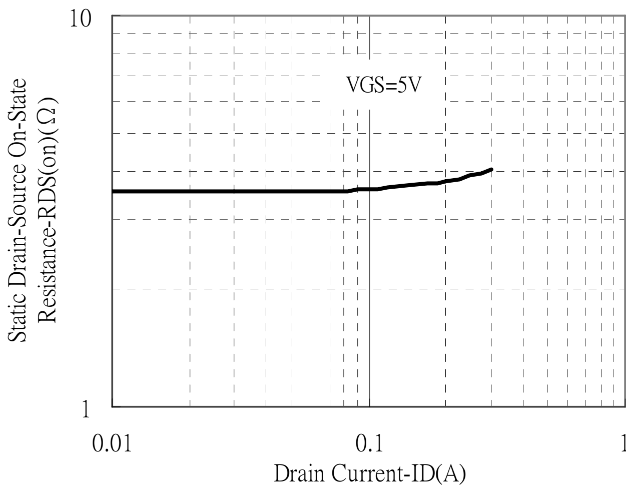

Gate Charge
VGS - Gate-to-Source Voltage (V)
VDS = 15 V
ID = 10 A
Qg - Total Gate Charge (nC)

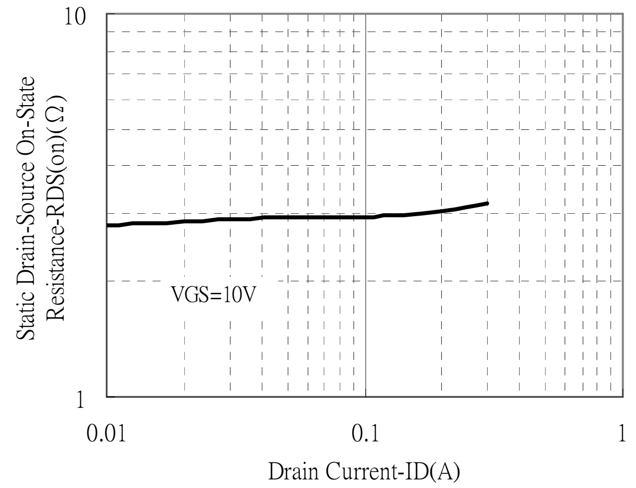

On-Resistance vs. Drain Current
ID - Drain Current (A)
TC = 25°C
VSD - Source-to-Drain Voltage (V)

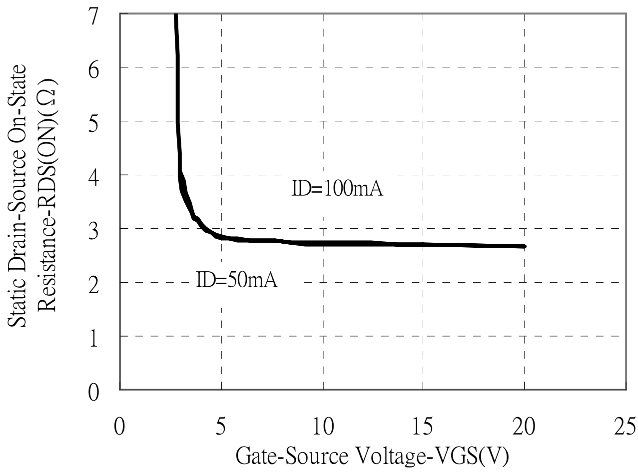
N-CH MOSFET 2



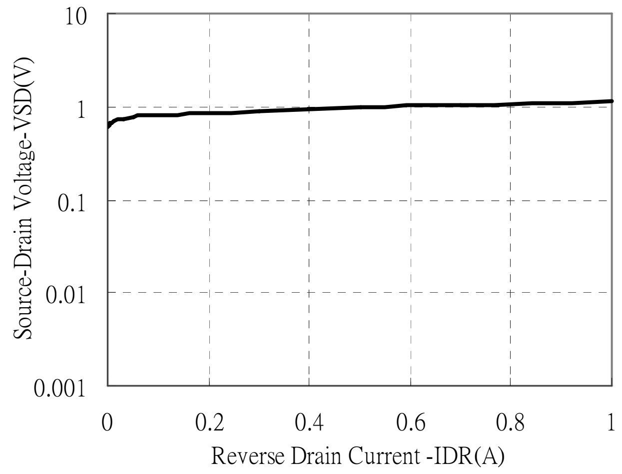




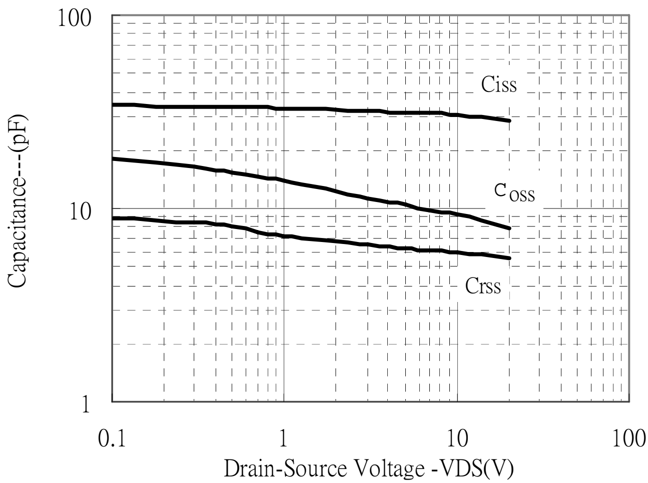




Static Drain-Source On-State Resistance vs Gate-Source Voltage
Static Drain-Source On-State Resistance-RDS(ON)(Ω)
Gate-Source Voltage-VGS(V)
ID=100mA
ID=50mA
0
1
2
3
4
5
6
7
0
5
10
15
20
25

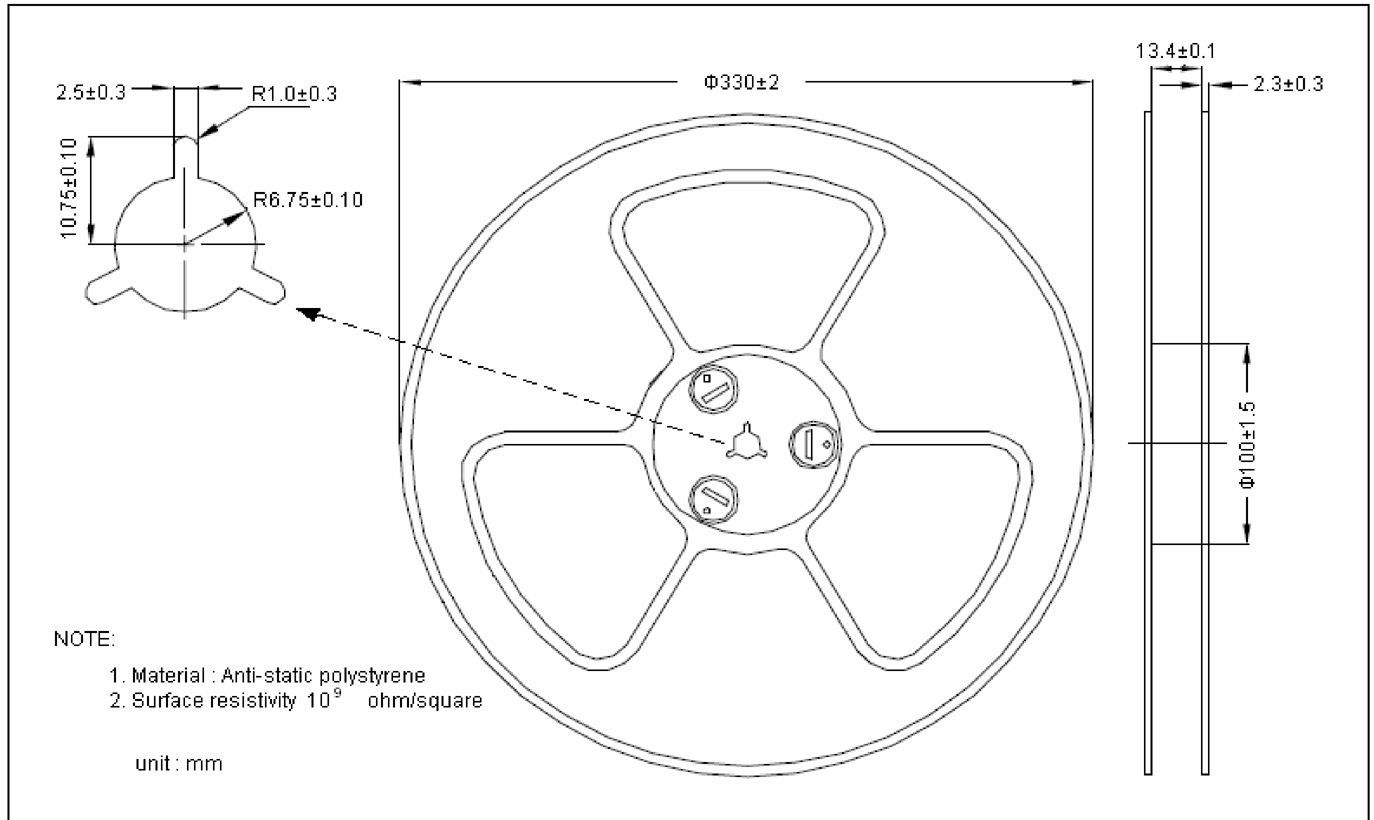


Reverse Drain Current vs Source-Drain Voltage
Source-Drain Voltage-VSD(V)
Reverse Drain Current -IDR(A)
10
1
0.1
0.01
0.001
0
0.2
0.4
0.6
0.8
1

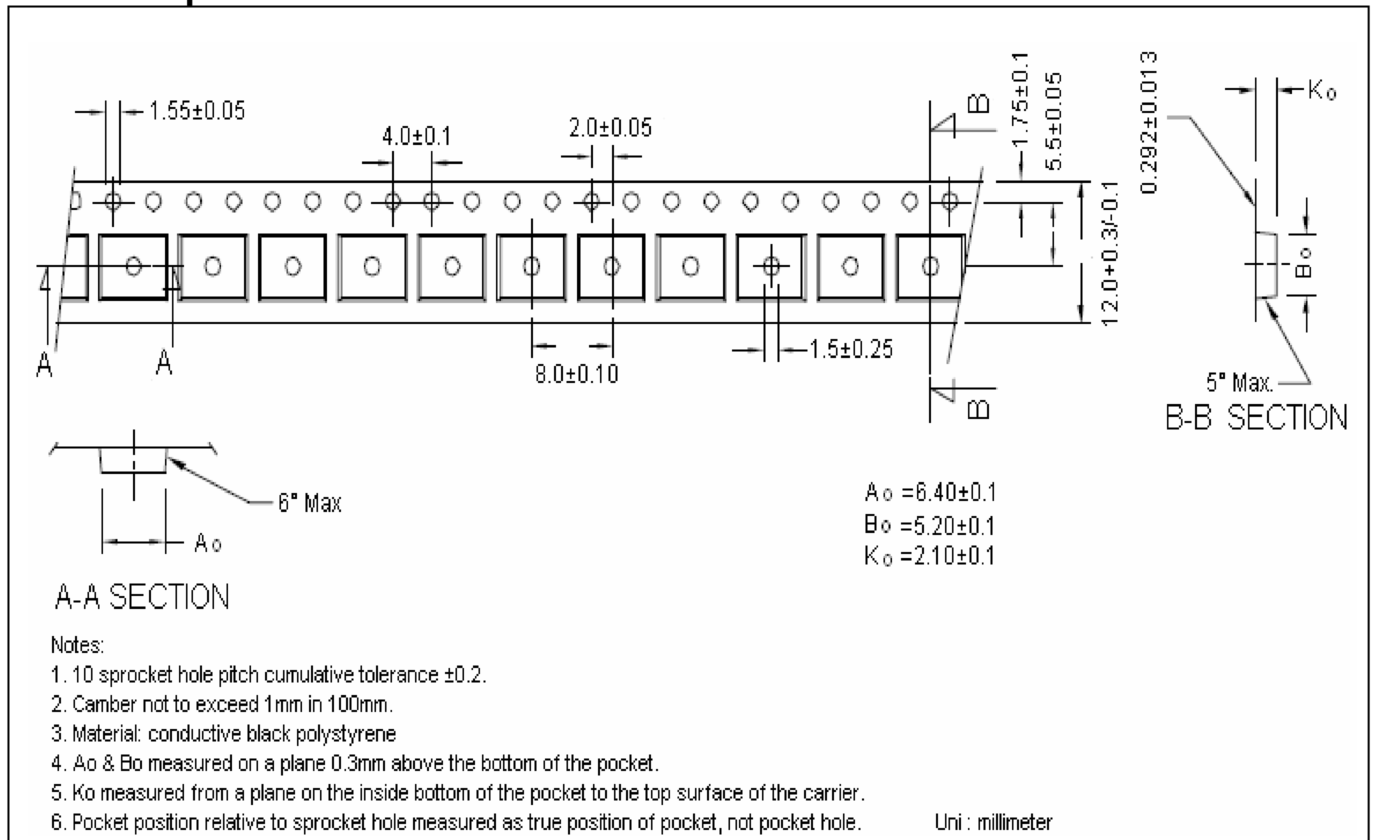


Capacitance vs Drain-to-Source Voltage
Capacitance---(pF)
Drain-Source Voltage -VDS(V)
Ciss
Coss
Crss
100
10
1
0.1
1
10
100

Reel Dimension



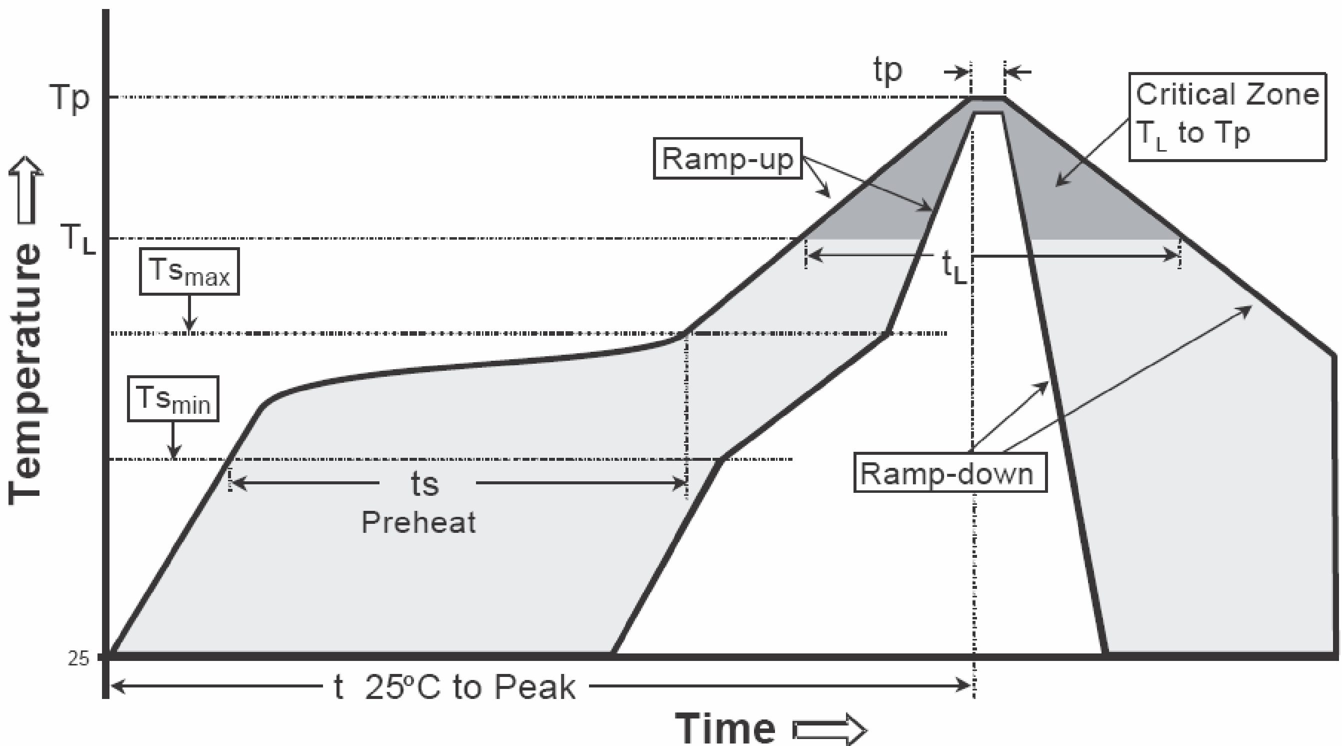
Carrier Tape Dimension



Recommended wave soldering condition

Product	Peak Temperature	Soldering Time
Pb-free devices	260 +0/-5 °C	5 +1/-1 seconds

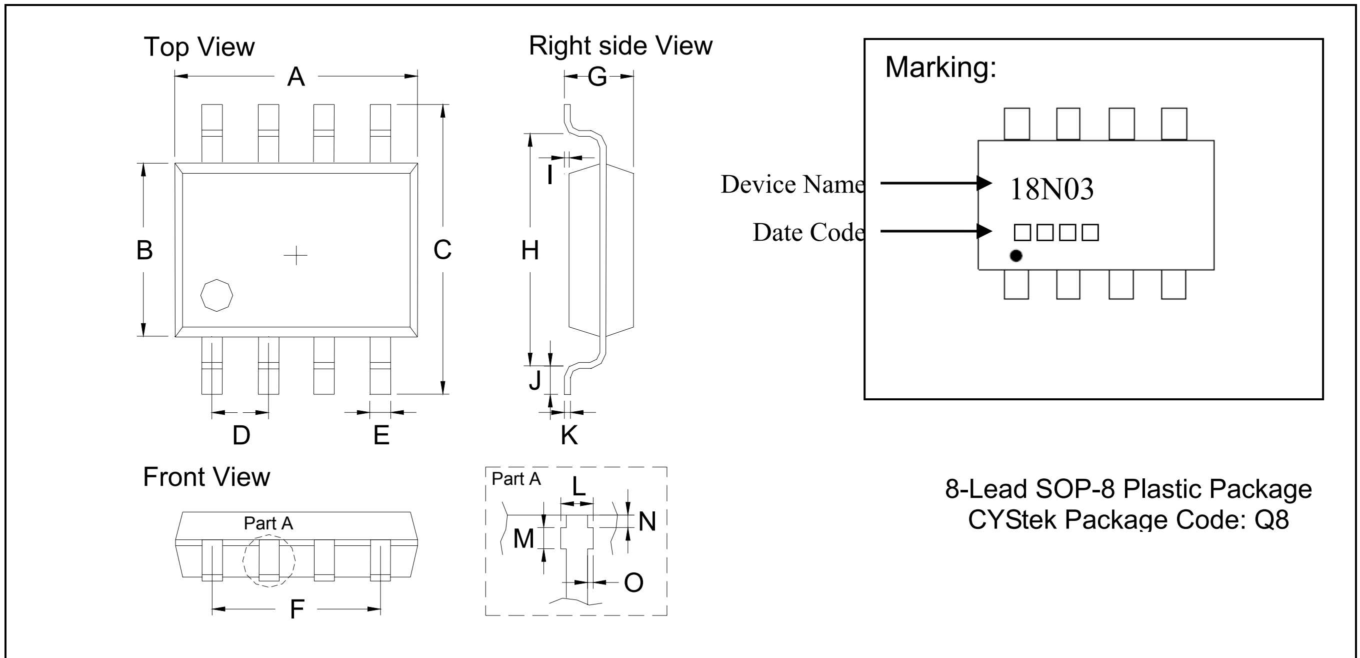
Recommended temperature profile for IR reflow



Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (Tsmax to Tp)	3°C/second max.	3°C/second max.
Preheat −Temperature Min(Ts min) −Temperature Max(Ts max) −Time(ts min to ts max)	100°C 150°C 60-120 seconds	150°C 200°C 60-180 seconds
Time maintained above: −Temperature (TL) − Time (tL)	183°C 60-150 seconds	217°C 60-150 seconds
Peak Temperature(TP)	240 +0/-5 °C	260 +0/-5 °C
Time within 5°C of actual peak temperature(tp)	10-30 seconds	20-40 seconds
Ramp down rate	6°C/second max.	6°C/second max.
Time 25 °C to peak temperature	6 minutes max.	8 minutes max.

Note : All temperatures refer to topside of the package, measured on the package body surface.

SOP-8 Dimension



*: Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.1890	0.2007	4.80	5.10	I	0.0098	REF	0.25	REF
B	0.1496	0.1654	3.80	4.20	J	0.0118	0.0354	0.30	0.90
C	0.2283	0.2441	5.80	6.20	K	0.0074	0.0098	0.19	0.25
D	0.0480	0.0519	1.22	1.32	L	0.0145	0.0204	0.37	0.52
E	0.0138	0.0193	0.35	0.49	M	0.0118	0.0197	0.30	0.50
F	0.1472	0.1527	3.74	3.88	N	0.0031	0.0051	0.08	0.13
G	0.0531	0.0689	1.35	1.75	O	0.0000	0.0059	0.00	0.15
H	0.1889	0.2007	4.80	5.10					

Notes: 1.Controlling dimension: millimeters.
2.Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.
3.If there is any question with packing specification or packing method, please contact your local CYStek sales office.

Material:

- Lead: Pure tin plated.
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0.

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