

**N-Channel LOGIC Level Enhancement Mode Power MOSFET**

# MTB20N03Q8

BV <sub>DSS</sub>	30 V
I <sub>D</sub>	8A
R <sub>DS(on)</sub> (max)	20mΩ

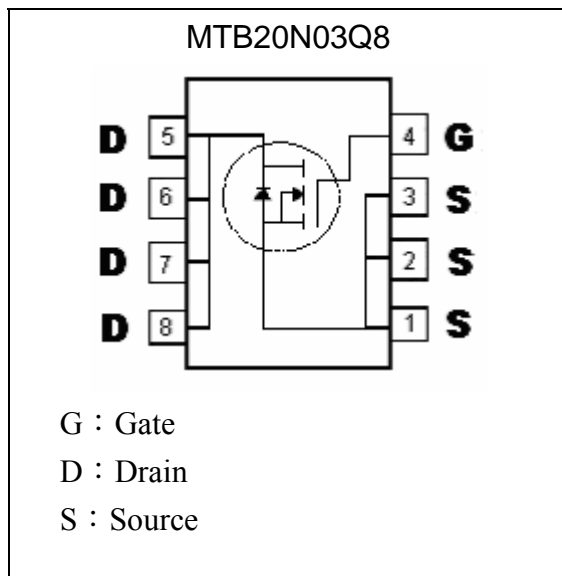
## Description

The MTB20N03Q8 is a N-channel enhancement-mode MOSFET, providing 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.

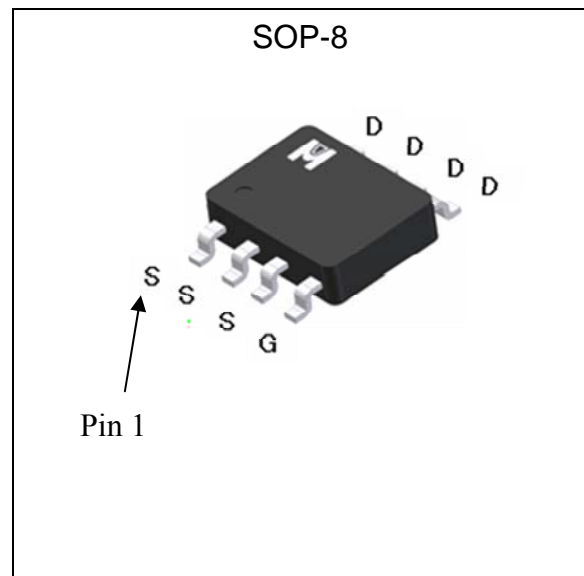
## Features

- Single Drive Requirement
- Low On-resistance
- Fast Switching Characteristic
- Dynamic dv/dt rating
- Repetitive Avalanche Rated
- UIS, Rg 100% tested
- Pb-free & Halogen-free package

## Symbol



## Outline





**Absolute Maximum Ratings** (Tc=25°C, unless otherwise noted)

Parameter	Symbol	Limits	Unit	
Drain-Source Voltage	V <sub>DS</sub>	30	V	
Gate-Source Voltage	V <sub>GS</sub>	±20		
Continuous Drain Current @ Tc=25°C	I <sub>D</sub>	8	A	
Continuous Drain Current @ Tc=100°C	I <sub>D</sub>	6		
Pulsed Drain Current	I <sub>DM</sub>	32 *1		
Avalanche Current	I <sub>AS</sub>	8		
Avalanche Energy @ L=0.1mH, I <sub>D</sub> =8A, R <sub>G</sub> =25 Ω	E <sub>AS</sub>	3.2	mJ	
Repetitive Avalanche Energy @ L=0.05mH	E <sub>AR</sub>	1.6 *2		
Total Power Dissipation	P <sub>D</sub>	T <sub>A</sub> =25 °C	3	W
		T <sub>A</sub> =100 °C	1.5	
Operating Junction and Storage Temperature	T <sub>j</sub> , T <sub>stg</sub>	-55~+175	°C	

Note : \*1. Pulse width limited by maximum junction temperature  
 \*2. Duty cycle ≤ 1%

**Thermal Data**

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-case	R <sub>th,j-c</sub>	25	°C/W
Thermal Resistance, Junction-to-ambient (Note)	R <sub>th,j-a</sub>	50	°C/W

Note : 50°C / W when mounted on a 1 in<sup>2</sup> pad of 2 oz copper.

**Characteristics (Tc=25°C, unless otherwise specified)**

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
<b>Static</b>					
BV <sub>DSS</sub>	30	-	-	V	V <sub>GS</sub> =0, I <sub>D</sub> =250μA
V <sub>GS(th)</sub>	1.0	1.5	3.0	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> =250μA
G <sub>FS</sub>	-	16	-	S	V <sub>DS</sub> =5V, I <sub>D</sub> =8A
I <sub>GSS</sub>	-	-	±100	nA	V <sub>GS</sub> =±20
I <sub>DSS</sub>	-	-	1	μA	V <sub>DS</sub> =24V, V <sub>GS</sub> =0
	-	-	25	μA	V <sub>DS</sub> =20V, V <sub>GS</sub> =0, T <sub>j</sub> =125°C
*I <sub>D(ON)</sub>	8	-	-	A	V <sub>DS</sub> =10V, V <sub>GS</sub> =10V
*R <sub>DS(ON)</sub>	-	15.5	20	mΩ	V <sub>GS</sub> =10V, I <sub>D</sub> =8A
	-	23	31	mΩ	V <sub>GS</sub> =5V, I <sub>D</sub> =6A
<b>Dynamic</b>					
Q <sub>g</sub> (V <sub>GS</sub> =10V) *1, 2	-	11	-	nC	I <sub>D</sub> =8A, V <sub>DS</sub> =15V, V <sub>GS</sub> =10V
Q <sub>g</sub> (V <sub>GS</sub> =5V) *1, 2	-	6	-		
Q <sub>gs</sub> *1, 2	-	1.2	-		
Q <sub>gd</sub> *1, 2	-	3.3	-		
C <sub>iss</sub>	-	1115	-	pF	V <sub>GS</sub> =0V, V <sub>DS</sub> =15V, f=1MHz
C <sub>oss</sub>	-	116	-		
C <sub>rss</sub>	-	82	-		
R <sub>g</sub>	-	2	-	Ω	V <sub>GS</sub> =15mV, V <sub>DS</sub> =0V, f=1MHz



**Characteristics (Cont. Tc=25°C, unless otherwise specified)**

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
<b>Dynamic</b>					
t <sub>d(ON)</sub> *1, 2	-	11	-	ns	V <sub>DS</sub> =15V, I <sub>D</sub> =1A, V <sub>GS</sub> =10V, R <sub>G</sub> =6Ω
t <sub>r</sub> *1, 2	-	16	-		
t <sub>d(OFF)</sub> *1, 2	-	36	-		
t <sub>f</sub> *1, 2	-	20	-		
<b>Source-Drain Diode Ratings and Characteristics</b>					
I <sub>S</sub> *1	-	-	2.3	A	
I <sub>SM</sub> *3	-	-	9.2		
V <sub>SD</sub> *1	-	-	1.2	V	I <sub>F</sub> =I <sub>S</sub> , V <sub>GS</sub> =0V
t <sub>rr</sub>	-	50	-	ns	I <sub>F</sub> =I <sub>S</sub> , dI <sub>F</sub> /dt=100A/μs
Q <sub>rr</sub>	-	2	-	nC	

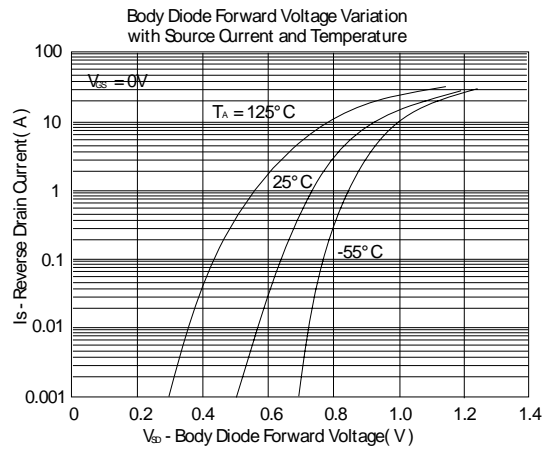
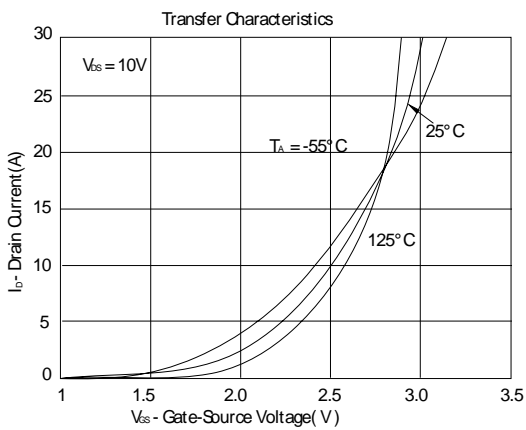
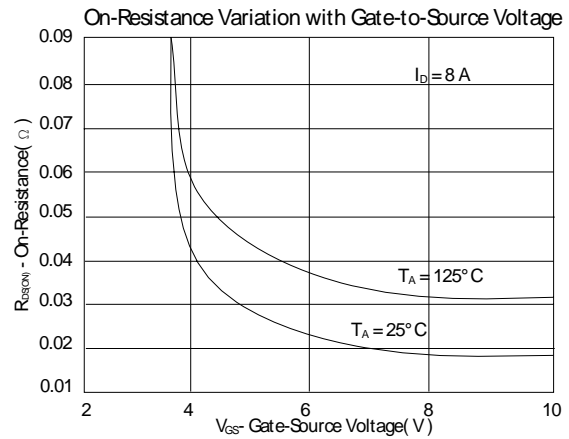
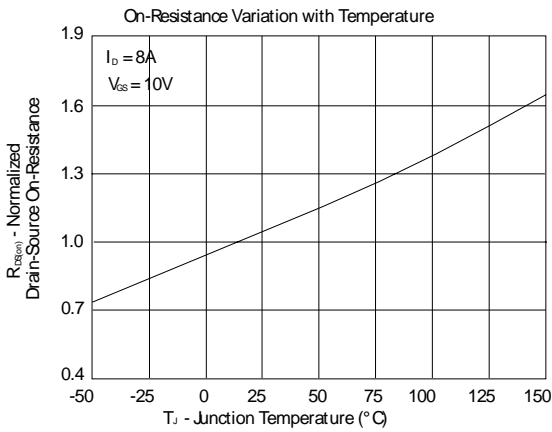
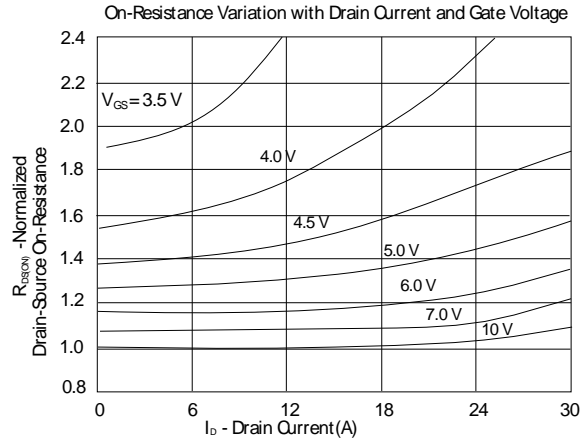
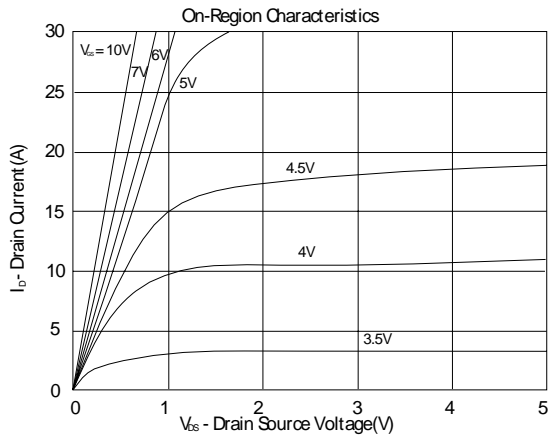
Note : \*1.Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%  
\*2.Independent of operating temperature  
\*3.Pulse width limited by maximum junction temperature.

**Ordering Information**

Device	Package	Shipping	Marking
MTB20N03Q8	SOP-8 (RoHS compliant & Halogen-free package)	3000 pcs / Tape & Reel	B20N03

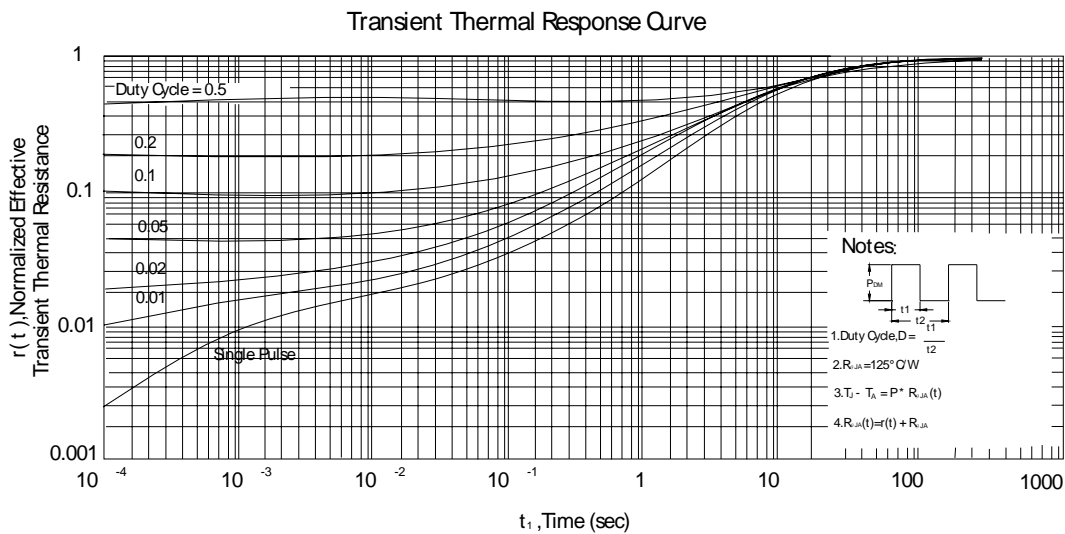
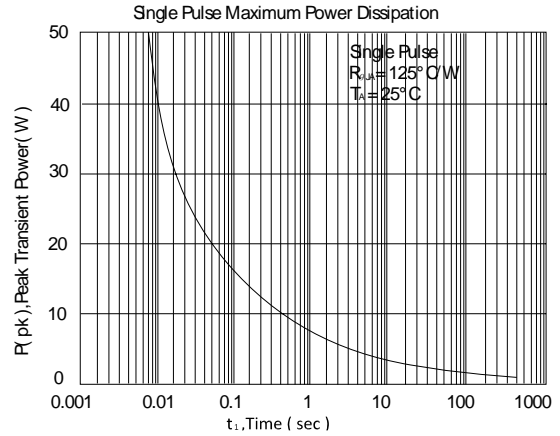
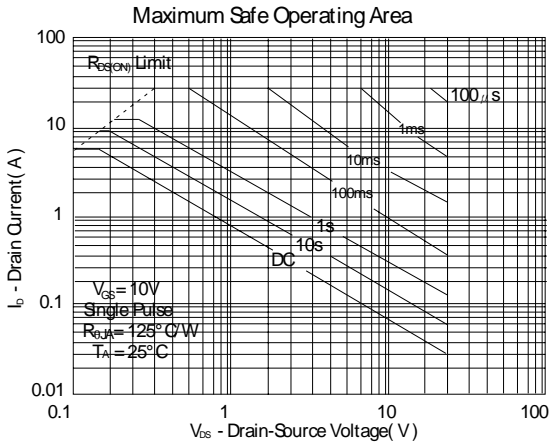
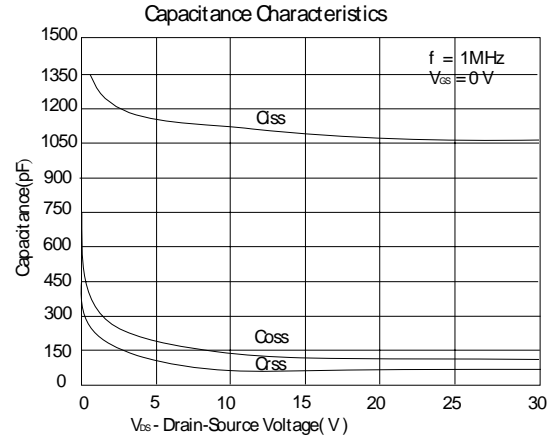
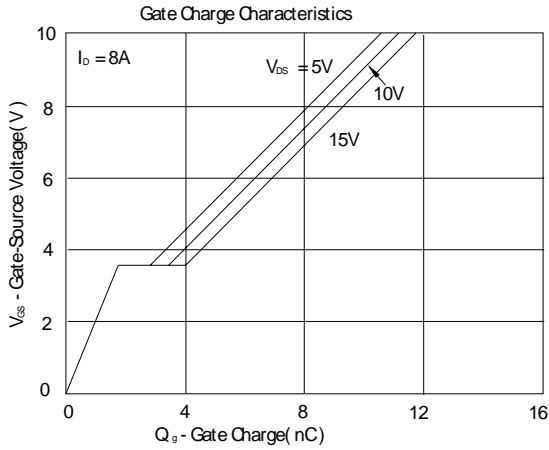


**Characteristic Curves**

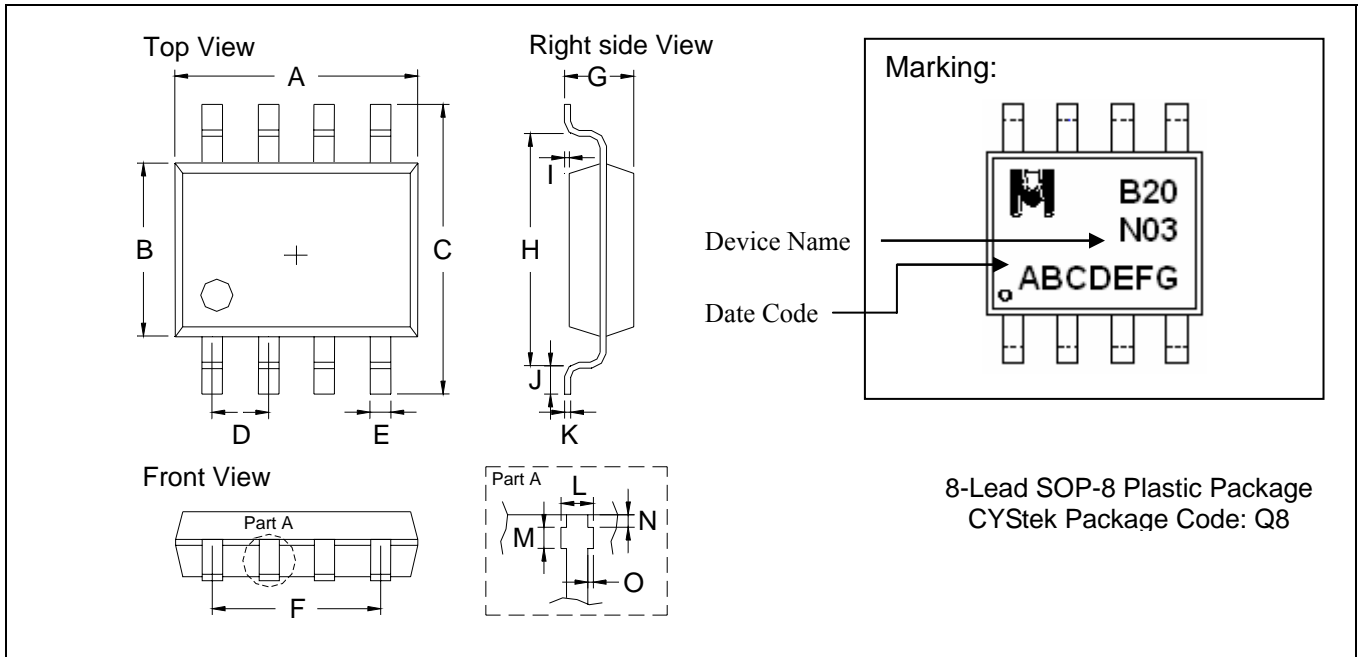




**Characteristic Curves(Cont.)**



**SOP-8 Dimension**



\*: Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.1909	0.2007	4.85	5.10	I	0.0019	0.0078	0.05	0.20
B	0.1515	0.1555	3.85	3.95	J	0.0118	0.0275	0.30	0.70
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	0.0145	0.0185	0.37	0.47	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	0.0570	0.0649	1.45	1.65	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: 42 Alloy; solder plating
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0

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