N-Channel LOGIC Level Enhancement Mode Power MOSFET

MTB20N03Q8

BV_{DSS}	30 V
I_D	8A
R_{DSON}(max)	20mΩ

Description

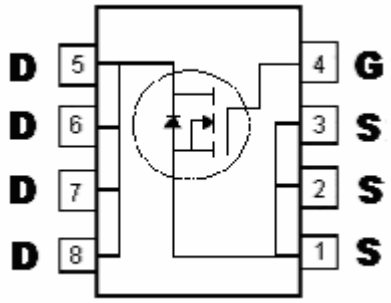
The MTB20N03Q8 is a N-channel enhancement-mode MOSFET, providing the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost effectiveness. The SOP-8 package is universally preferred for all commercial-industrial surface mount applications and suited 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

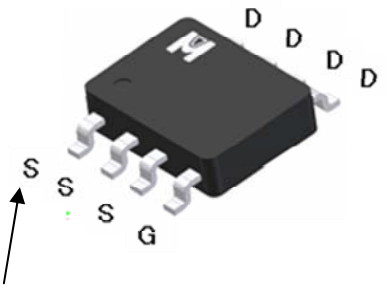
MTB20N03Q8



G：Gate
D：Drain
S：Source

Outline

SOP-8



Pin 1

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

Parameter		Symbol	Limits	Unit
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current @ T_C=25°C		I_D	8	A
Continuous Drain Current @ T_C=100°C		I_D	6	
Pulsed Drain Current		I_{DM}	32 *1	
Avalanche Current		I_{AS}	8	
Avalanche Energy @ L=0.1mH, I_D=8A, R_G=25Ω		E_{AS}	3.2	mJ
Repetitive Avalanche Energy @ L=0.05mH		E_{AR}	1.6 *2	
Total Power Dissipation	T_A=25 °C	P_D	3	W
	T_A=100 °C		1.5	
Operating Junction and Storage Temperature		Tj, Tstg	-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	$R_{th,j-c}$	25	°C/W
Thermal Resistance, Junction-to-ambient (Note)	$R_{th,j-a}$	50	°C/W

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

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

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	30	-	-	V	V_{GS}=0, I_D=250μA
$V_{GS(th)}$	1.0	1.5	3.0	V	V_{DS} = V_{GS}, I_D=250μA
G_{FS}	-	16	-	S	V_{DS} =5V, I_D=8A
I_{GSS}	-	-	±100	nA	V_{GS}=±20
I_{DSS}	-	-	1	μA	V_{DS} =24V, V_{GS} =0
	-	-	25	μA	V_{DS} =20V, V_{GS} =0, Tj=125°C
*$I_{D(ON)}$	8	-	-	A	V_{DS} =10V, V_{GS}=10V
*$R_{DS(ON)}$	-	15.5	20	mΩ	V_{GS} =10V, I_D=8A
	-	23	31	mΩ	V_{GS} =5V, I_D=6A
Dynamic					
Qg (V_{GS}=10V) *1, 2	-	11	-	nC	I_D=8A, V_{DS}=15V, V_{GS}=10V
Qg (V_{GS}=5V) *1, 2	-	6			
Qgs *1, 2	-	1.2	-		
Qgd *1, 2	-	3.3	-		
Ciss	-	1115	-	pF	V_{GS}=0V, V_{DS}=15V, f=1MHz
Coss	-	116	-		
Crss	-	82	-		
Rg	-	2	-	Ω	V_{GS}=15mV, V_{DS}=0V, f=1MHz

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

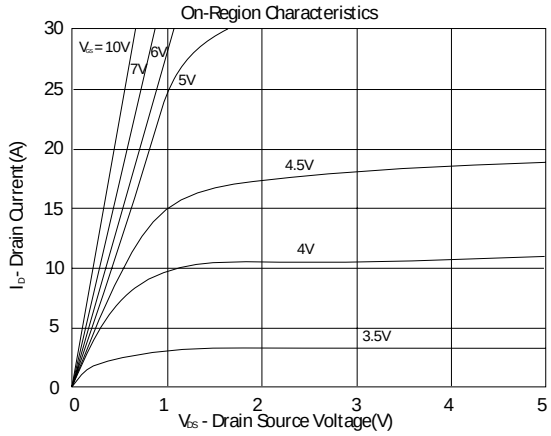
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Dynamic					
$t_{d(ON)}$ *1, 2	-	11	-	ns	V_{DS}=15V, I_D=1A, V_{GS}=10V, R_G=6Ω
tr *1, 2	-	16	-		
$t_{d(OFF)}$ *1, 2	-	36	-		
t_f *1, 2	-	20	-		
Source-Drain Diode Ratings and Characteristics					
I_S *1	-	-	2.3	A	
I_{SM} *3	-	-	9.2		
V_{SD} *1	-	-	1.2	V	I_F=I_S, V_{GS}=0V
trr	-	50	-	ns	I_F=I_S, dI_F/dt=100A/μs
Qrr	-	2	-	nC	

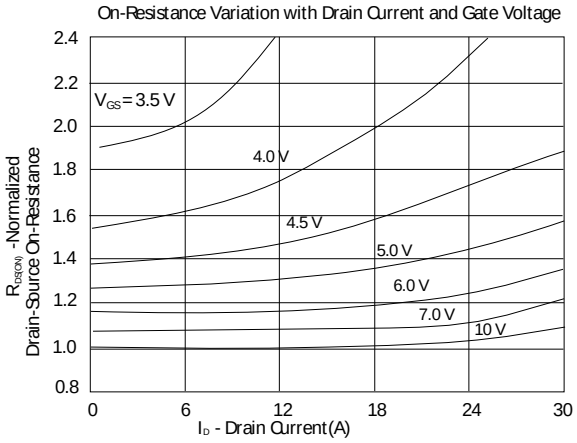
Note : *1.Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%
*2.Independent of operating temperature
*3.Pulse width limited by maximum junction temperature.

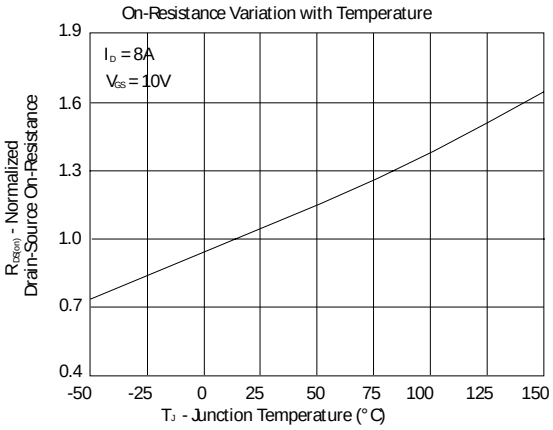
Ordering Information

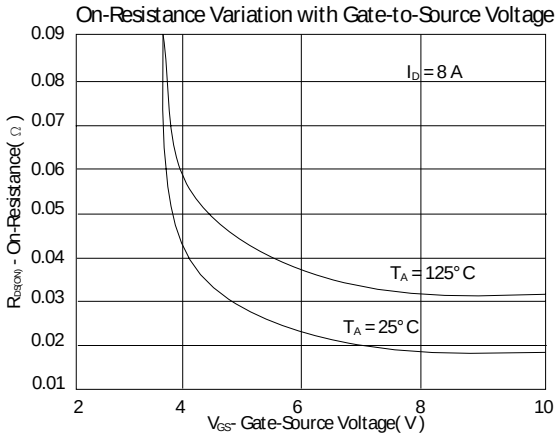
Device	Package	Shipping	Marking
MTB20N03Q8	SOP-8 (RoHS compliant & Halogen-free package)	3000 pcs / Tape & Reel	B20N03

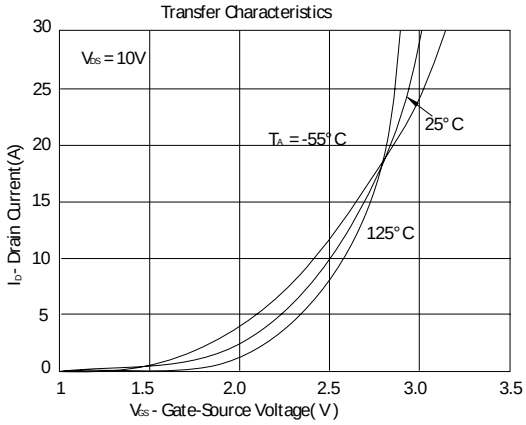
Characteristic Curves

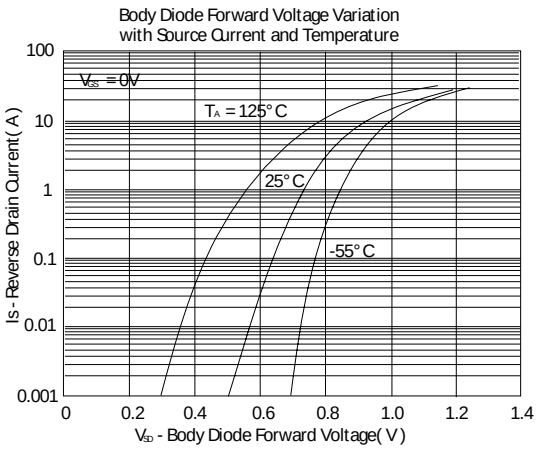






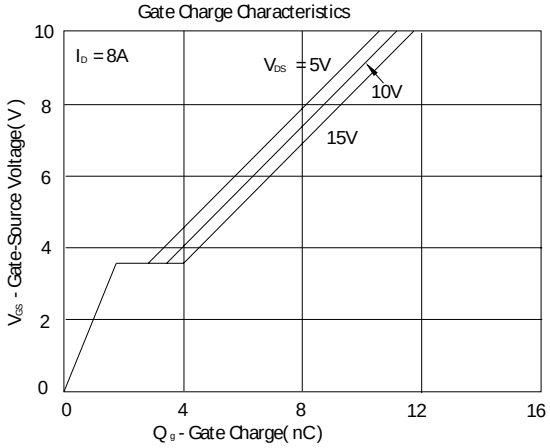




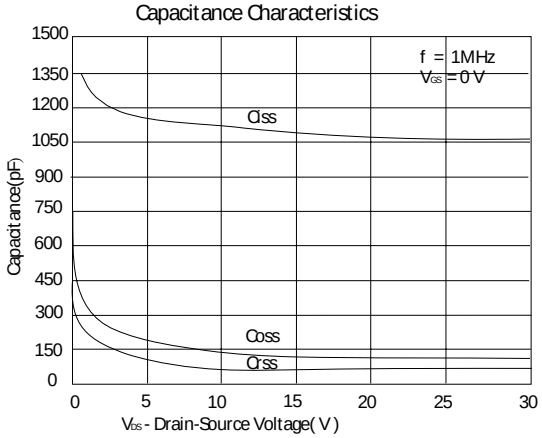


Characteristic Curves(Cont.)

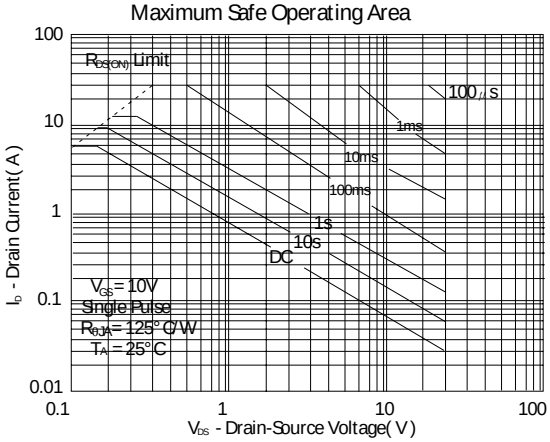
Gate Charge Characteristics



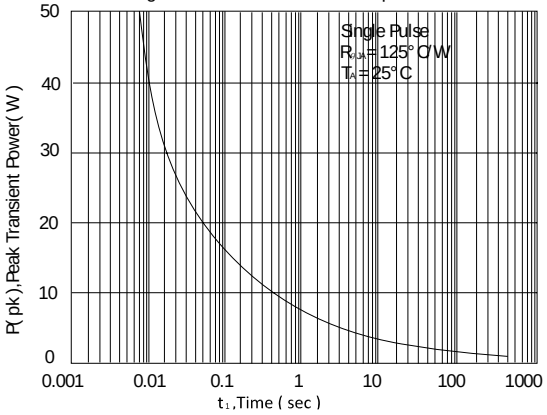
Capacitance Characteristics



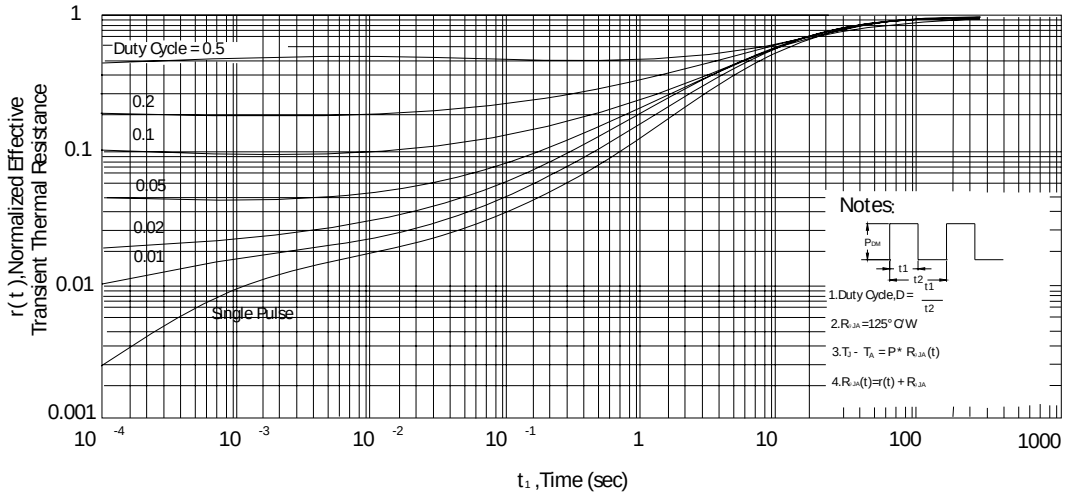
Maximum Safe Operating Area



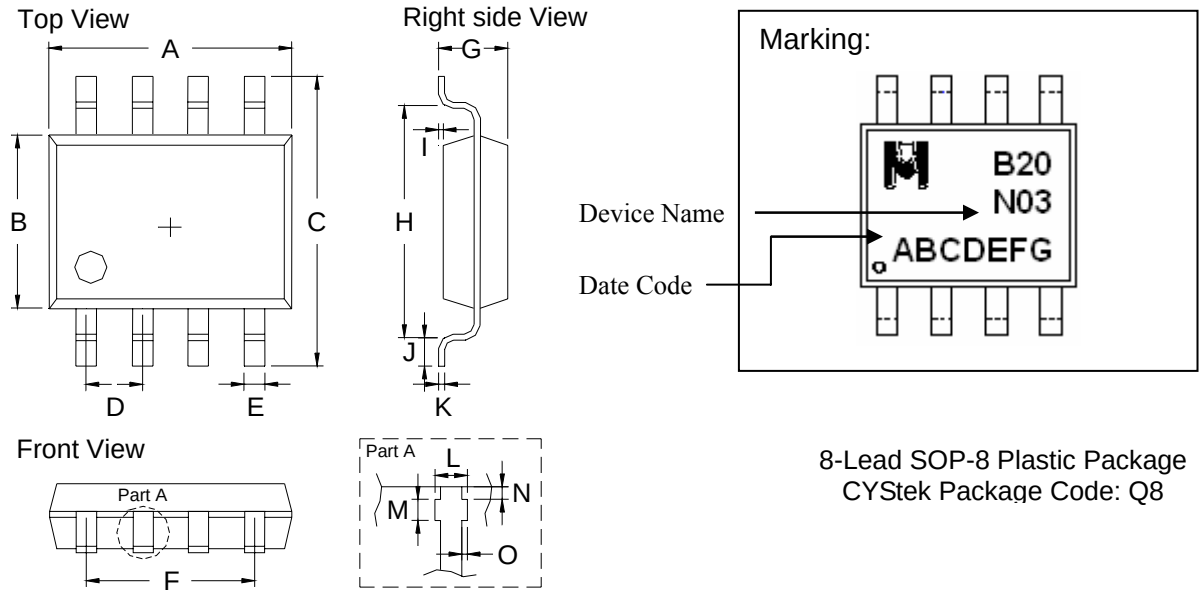
Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve



SOP-8 Dimension



8-Lead SOP-8 Plastic Package
CYStek Package Code: Q8

*: 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