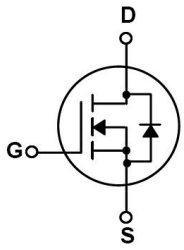
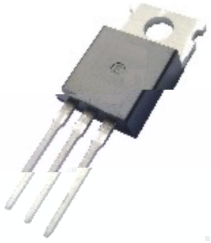
TO-220 N MOS N-CHANNEL MOSFET in a TO-220 Plastic Package.

Fast Switching, Low ON Resistance, Low Gate Charge, Low Reverse transfer capacitances,100% Single Pulse avalanche energy Test.

For UPS, inverters, lightin.





PIN1 G PIN 2 D PIN 3 S

See Marking Instructions.

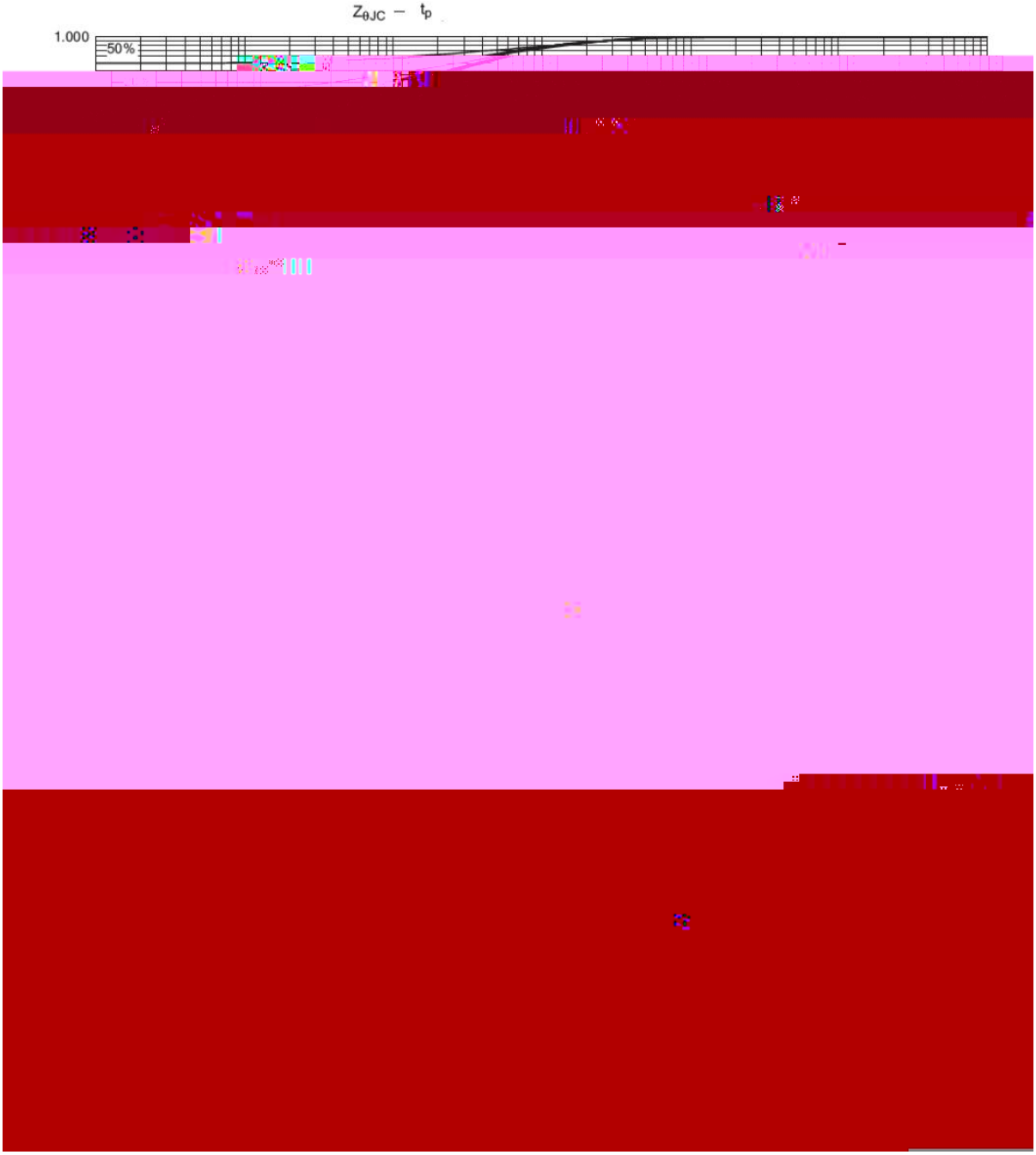
Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DSS}	200	V
Drain Current	I_D	40	A
Gate-Source Voltage	V_{GS}	±20	V
Power Dissipation	$P_D(T_C=25℃)$	250	W
Repetitive Avalanche Energy	E_{AS}[a1]	500	mJ
Peak Diode Recovery dv/dt	dv/dt[a2]	5	V/ns
Junction Temperature Range	T_J	150	℃
Storage Temperature Range	T_{stg}	-55 to 150	℃
Temperature for Soldering	T_L	300	℃
Thermal Resistance Junction- Case	$R_{\theta JC}$	0.65	℃/W
Thermal Resistance Junction- Ambient	$R_{\theta JA}$	62.5	℃/W

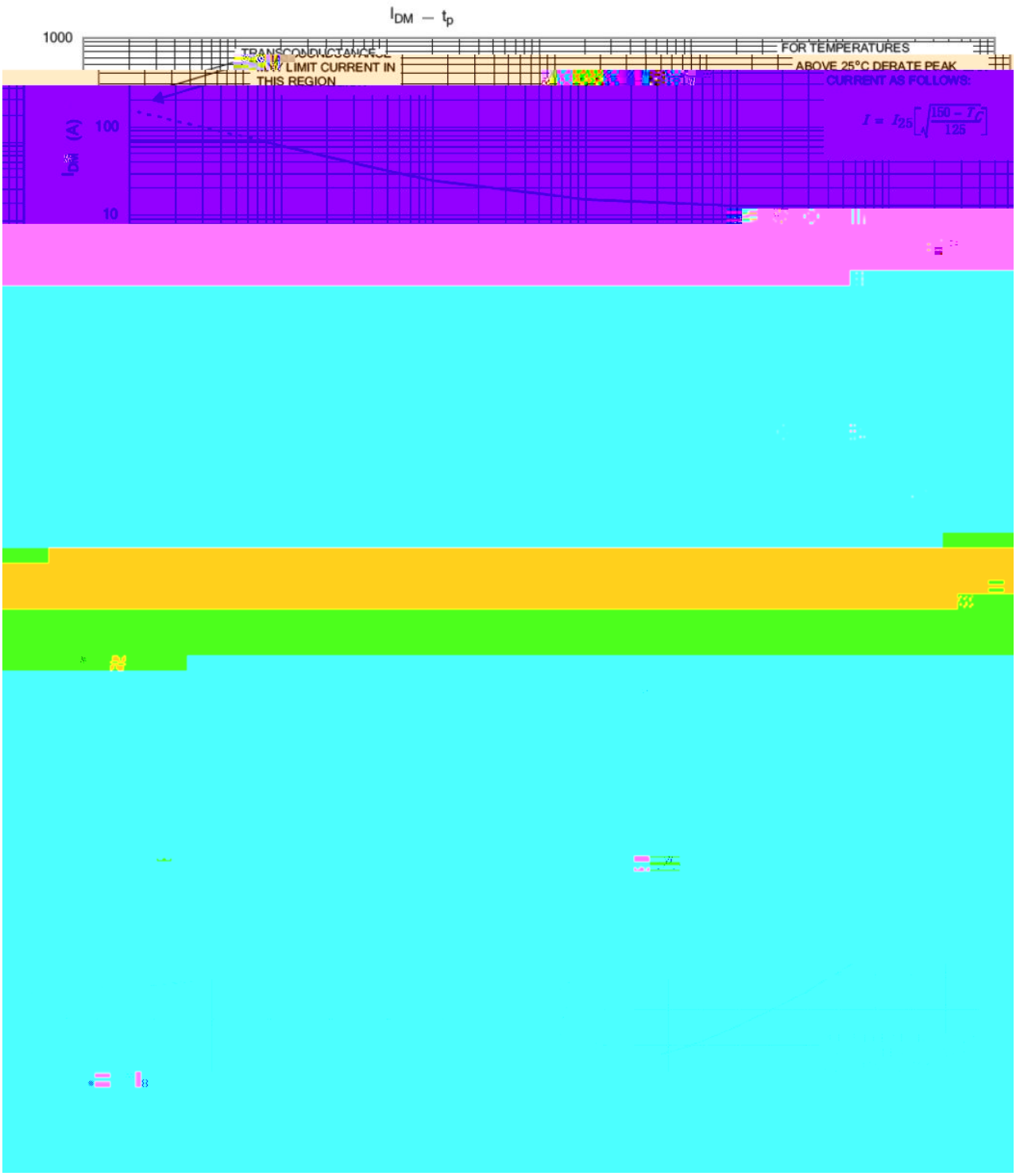
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{DSS}	V_{GS}=0V I_D=250μA	200			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=200V V_{GS}=0V T_a=25℃			10	μA
		V_{DS}=160V V_{GS}=0V T_a=125℃			200	
Gate-Body Leakage Current Forward	I_{GSS}	V_{GS}=±20V			±100	nA
Static Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=10V I_D=20A		0.054	0.065	Ω
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS} I_D=250μA	2.0		4	V
Forward Transconductance	g_{fs}	V_{DS}=15V I_D=20A		65		S
Input Capacitance	C_{iss}	V_{GS}=0V V_{DS}=25V f=1.0MHz		5000		pF
Output Capacitance	C_{oss}			300		
Reverse Transfer Capacitance	C_{rss}			7		
Turn-On Delay Time	$t_{d(on)}$	I_D=20A V_{DD}=100V V_{GS} = 10V R_G = 3.9Ω		19		ns
Turn-On Rise Time	t_r			30		
Turn-Off Delay Time	$t_{d(off)}$			68		
Turn-Off Fall Time	t_f			25		

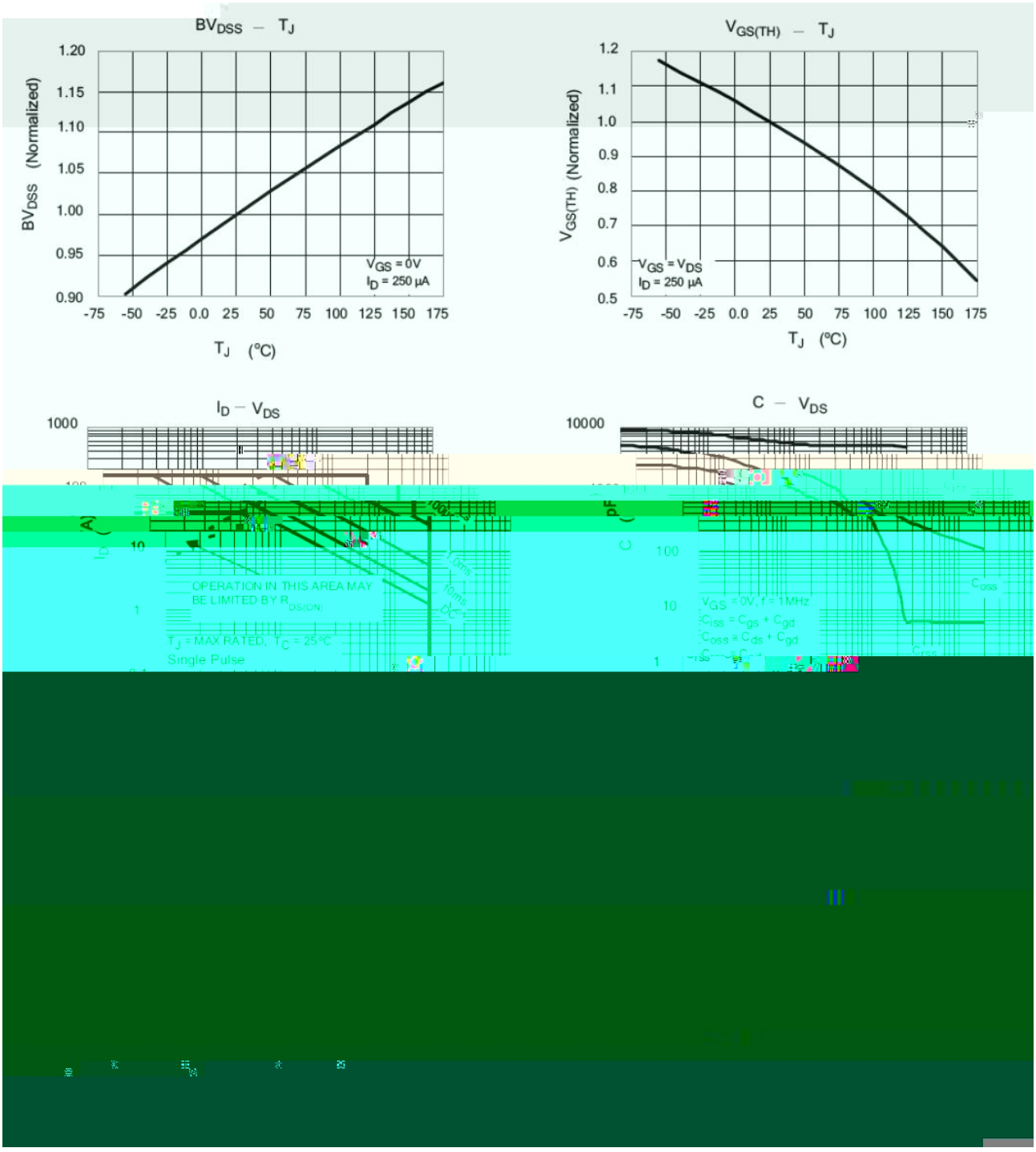
Total Gate Charge	Q_g	I_D=20A V_{DD}=100V V_{GS} = 10V		68		nC
Gate-Source Charge	Q_{gs}			17		
Gate-Drain Charge	Q_{gd}			16		
Continuous Source Current	I_S				40	A
Maximum Pulsed Current	I_{SM}				160	A
Diode Forward Voltage	V_{SD}	I_S=40A V_{GS}=0V			1.5	V
Reverse Recovery Time	t_{rr}	I_S=20A T_j=25℃ d_{IF}/d_t=100A/us,V_{GS}=0V		250		ns
Reverse Recovery Charge	Q_{rr}			1.5		μC

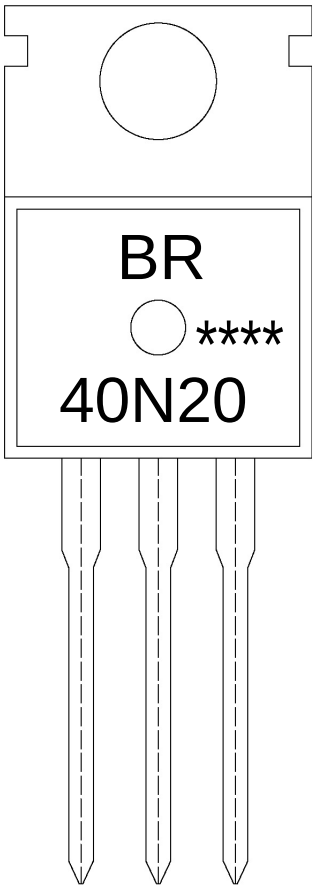
Notes:

a1：L=1.0mH, I_D=31.6A, Start T_J=25℃　　a2：I_{SD} =10A,di/dt ≤100A/us,V_{DD}≤B_{VDS}, Start T_J=25℃


$Z_{\theta JC}$ — t_p
1.000
50%


$I_{DM} - t_p$
1000
100
10
I_{DM} (A)
FOR TEMPERATURES
ABOVE 25°C DERATE PEAK
CURRENT AS FOLLOWS:
$I = I_{25}\sqrt{\frac{150 - T_C}{125}}$
THIS REGION

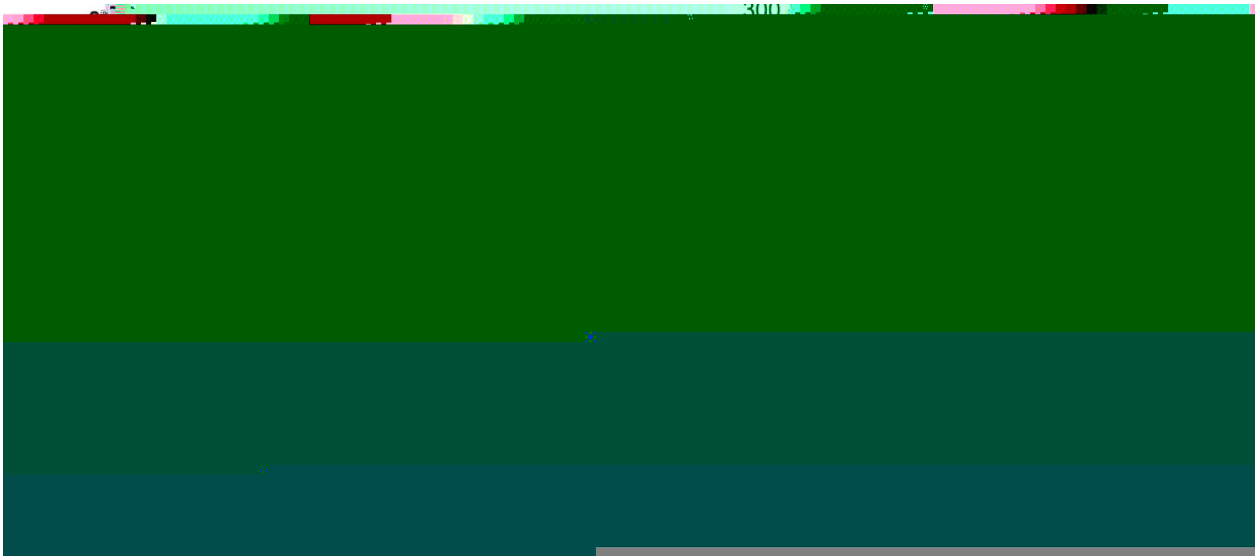

BVDSS – TJ
BVDSS (Normalized)
1.20
1.15
1.10
1.05
1.00
0.95
0.90
VGS = 0V
ID = 250 μA
-75 -50 -25 0.0 25 50 75 100 125 150 175
TJ (°C)
VGS(TH) – TJ
VGS(TH) (Normalized)
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
VGS = VDS
ID = 250 μA
-75 -50 -25 0.0 25 50 75 100 125 150 175
TJ (°C)
ID – VDS
1000
10
1
OPERATION IN THIS AREA MAY
BE LIMITED BY RDS(ON)
TJ = MAX RATED, TC = 25°C
Single Pulse
10ms
DC
C – VDS
10000
100
10
VGS = 0V, f = 1MHz
Ciss = Cgs + Cgd
Coss = Cds + Cgd
Coss
1



BR

Note:

BR:	Company Code
40N20:	Product Type.
****:	Lot No. Code, code change with Lot No.



1 25 150 60 90sec;	1.Preheating:25~150 , Time:60~90sec.
2 255 5 5 0.5sec;	2.Peak Temp.:255 5 , Duration:5 0.5sec.
3 2 10 /sec.	3. Cooling Speed: 2~10 /sec.

270 5 10 1 sec. Temp.:270±5℃ Time:10±1 sec

/ BULK

Package Type 封装形式	Units 包装数量					Dimension 包装尺寸 (unit: mm^3)		
	Units/Bag 只/袋	Bags/Inner Box 袋/盒	Units/Inner Box 只/盒	Inner Boxes/Outer Box 盒/箱	Units/Outer Box 只/箱	Bag 袋	Inner Box 盒	Outer Box 箱
TO-220/F	200	10	2,000	5	10,000	135×190	237×172×102	560×245×195

/ TUBE

Package Type 封装形式	Units 包装数量					Dimension 包装尺寸 (unit: mm^3)		
	Units/Tube 只/套管	Tubes/Inner Box 套管/盒	Units/Inner Box 只/盒	Inner Boxes/Outer Box 盒/箱	Units/Outer Box 只/箱	Tube 套管	Inner Box 盒	Outer Box 箱
TO-220/F	50	20	1,000	5	5,000	532×31.4×5.5	555×164×50	575×290×180