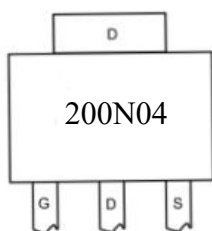


**Features**

- 100% EAS Guaranteed
- Green Device Available
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- Advanced high cell density Trench technology

Bvdss**40V*****Rdson*****2.6mΩ*****ID*****200A****Application**

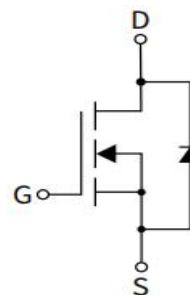
- Power factor correction (PFC)
- Switching power supply (SMPS)
- LED driver

RoHS**Package**

Marking and pin assignment



TO220 top view



Schematic diagram

Package Marking and Ordering Information

Device Marking	Device	Device Package	Quantity
200N04	200N04T	TO220	50

Absolute Maximum Ratings ($T_C=25^{\circ}\text{C}$ unless otherwise specified)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	40	V
Gate-Source Voltage		V_{GS}	± 25	V
Continuous Drain Current $V_{GS}@10V^1$	$I_D@T_C = 25^{\circ}\text{C}$	I_D	200	A
	$I_D@T_C = 100^{\circ}\text{C}$		125	A
Pulsed Drain Current ²		I_{DM}	760	A
Single Pulsed Avalanche Energy ³		EAS	198	mJ
Avalanche Current		I_{AS}	28	A
Total Power Dissipation		P_D	62	W
Operating Junction Temperature Range		T_J	-55 ~ 150	$^{\circ}\text{C}$
Storage Temperature Range		T_{STG}	-55 ~ 150	$^{\circ}\text{C}$

Thermal Resistance Ratings

Parameter	Symbol	Value	Unit
Thermal Resistance Junction-Ambient ¹	$R_{\theta JA}$	--	$^{\circ}\text{C}/\text{W}$
Thermal Resistance Junction-Case ¹	$R_{\theta JC}$	2	$^{\circ}\text{C}/\text{W}$



Ordering Information

Ordering Number	Package	Pin Assignment			Packing
Halogen Free		G	D	S	
HL200N04T	TO220	1	2	3	Tube

Electrical Characteristics ($T_J=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Drain to Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	40	-	-	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=40V, V_{GS}=0V, T_J=25^{\circ}\text{C}$	-	-	1	μA
		$V_{DS}=40V, V_{GS}=0V, T_J=100^{\circ}\text{C}$	-	-	100	
Gate to Source Leakage Current	I_{GSS}	$V_{GS}=\pm 25V, V_{DS}=0V$	-	-	± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	2	2.8	4	V
Static Drain-Source On-Resistance ²	$R_{DS(on)}$	$V_{GS}=10V, I_D=57A$	-	2.6	3.5	m Ω
Forward Transconductance	g_{fs}	$V_{DS}=5V, I_D=20A$	-	-	-	S
Gate Resistance	R_g	$V_{GS}=0V, V_{DS}=0V, f=1\text{MHz}$	-	-	-	Ω
Input Capacitance	C_{iss}	$V_{GS}=0V, V_{DS}=20V,$ $f=1\text{MHz}$	-	4900	-	pF
Output Capacitance	C_{oss}		-	528	-	
Reverse Transfer Capacitance	C_{rss}		-	317	-	
Total Gate Charge	Q_g	$V_{DS}=20V, V_{GS}=10V,$ $I_D=57A$	-	80	-	nC
Gate Source Charge	Q_{gs}		-	17	-	
Gate Drain Charge	Q_{gd}		-	21	-	
Turn-On Delay Time	$t_{d(on)}$	$V_{GS}=10V, V_{DD}=20V,$ $R_L=1\Omega, R_G=3\Omega,$ $I_D=57A$	-	21	-	nS
Rise Time	t_r		-	32	-	
Turn-Off Delay Time	$t_{d(off)}$		-	71	-	
Fall Time	t_f		-	40	-	
Continuous Source Current	I_S	$V_G=V_D=0V, \text{Force Current}$	-	-	200	A
Forward on Voltage ³	V_{SD}	$I_S=57A, V_{GS}=0V$	-	-	1.2	V
Reverse Recovery Time	t_{rr}	-	-	-	-	nS
Reverse Recovery Charge	Q_{rr}		-	-	-	nC

Notes:

- 1.Repetitive Rating: Pulse width limited by maximum junction temperature.
- 2.EAS condition: $T_J=25^{\circ}\text{C}, V_{DD}=20V, V_G=10V, R_g=25\Omega, L=0.5\text{mH}, I_{AS}=28A$.
- 3.Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 0.5\%$.



Typical Performance Characteristics

Figure 1: Output Characteristics

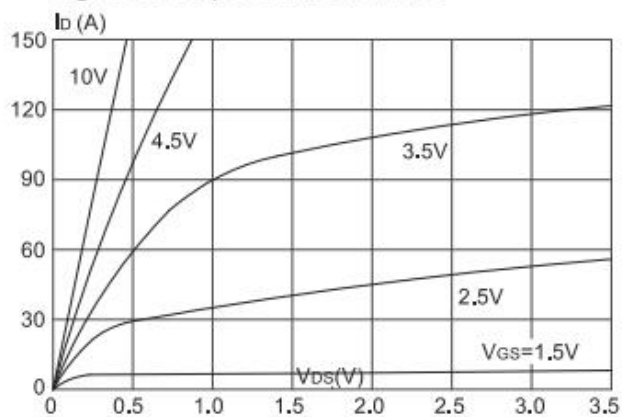


Figure 2: Typical Transfer Characteristics

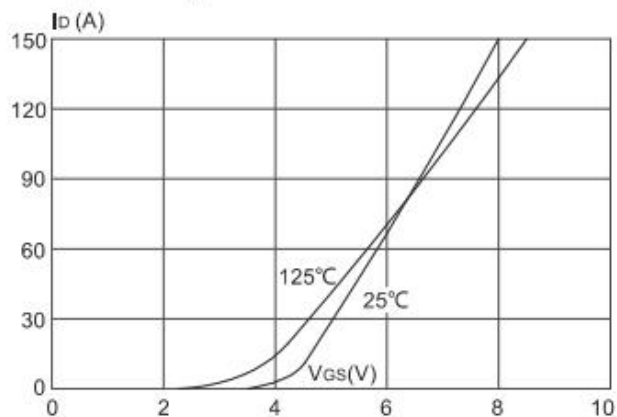


Figure 3: On-resistance vs. Drain Current

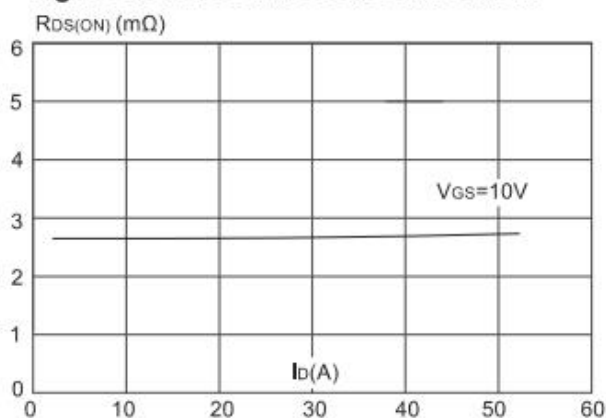


Figure 4: Body Diode Characteristics

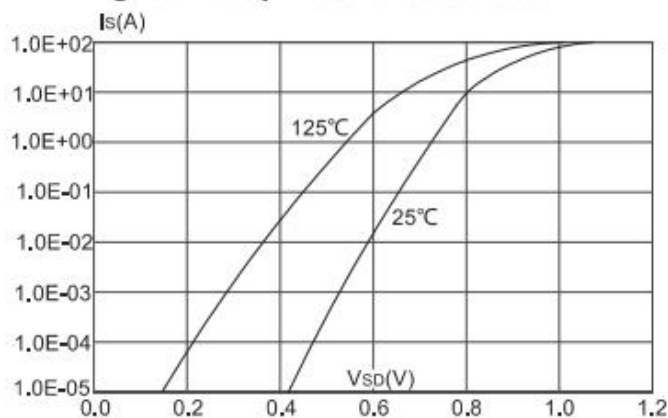


Figure 5: Gate Charge Characteristics

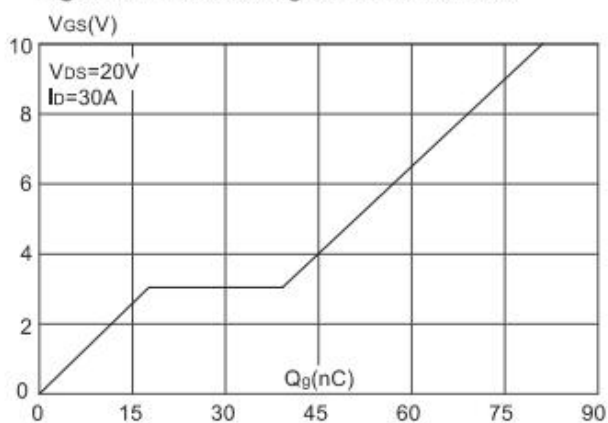


Figure 6: Capacitance Characteristics

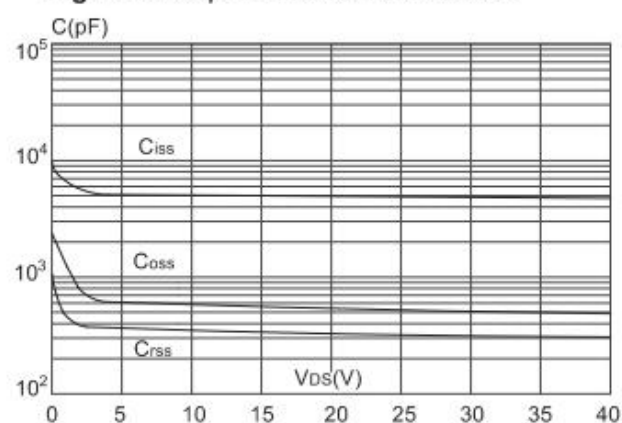




Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

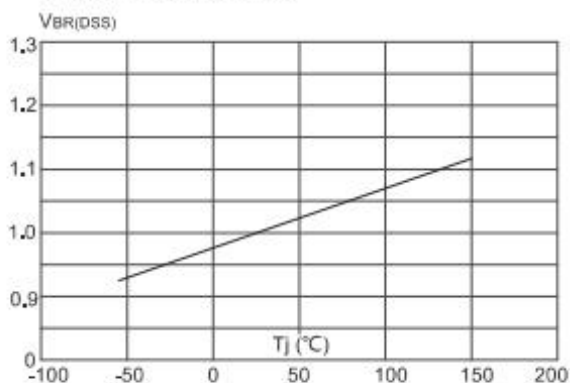


Figure 8: Normalized on Resistance vs. Junction Temperature

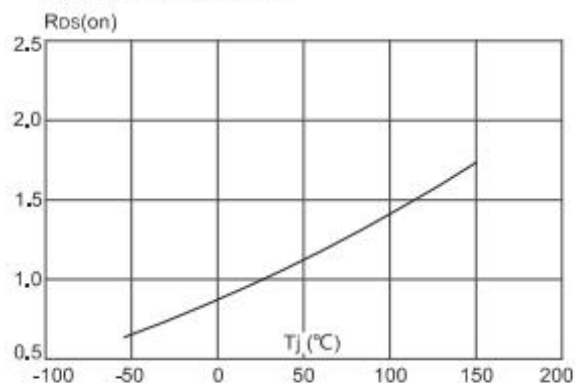


Figure 9: Maximum Safe Operating Area

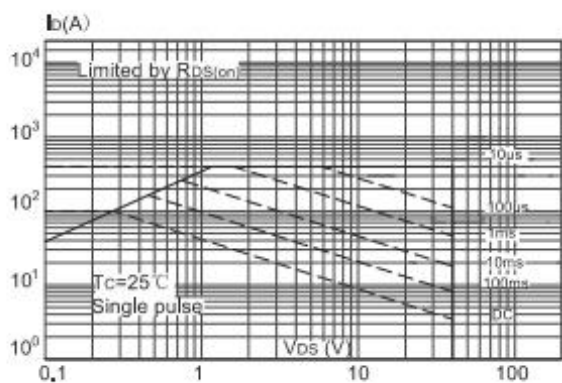


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

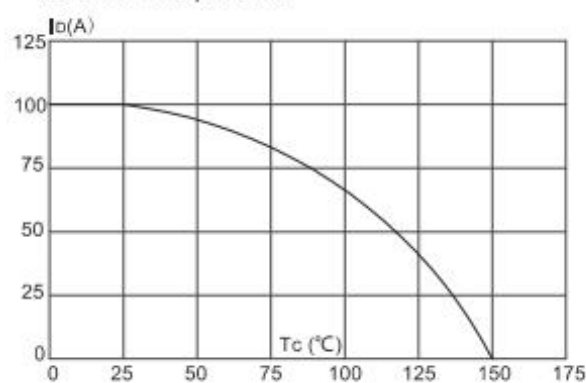
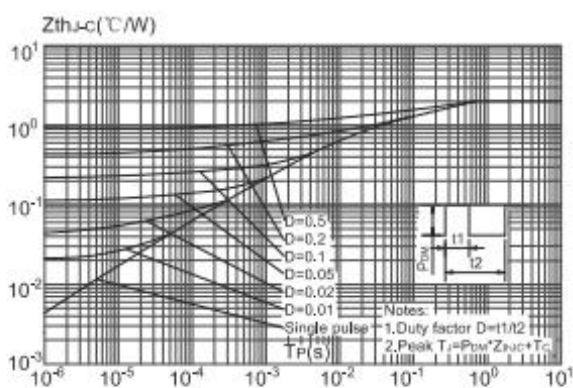
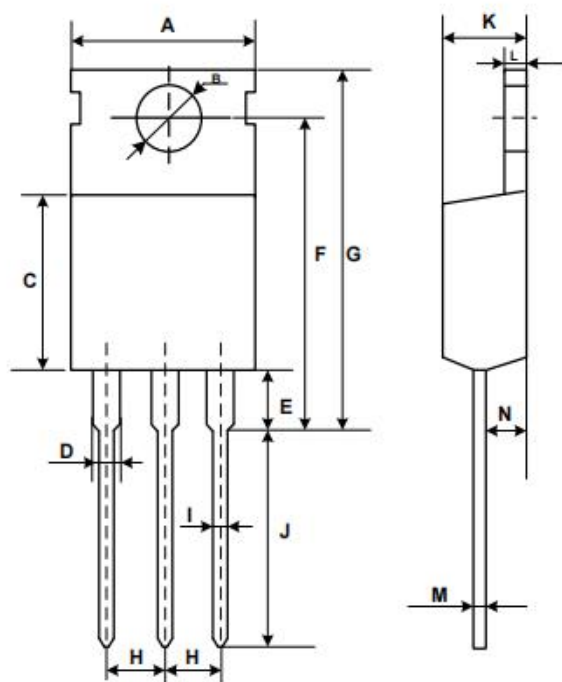


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case





Package Dimensions TO220



SYMBOL	MM	
	MIN	MAX
A	9.70	10.30
B	3.40	3.80
C	8.80	9.40
D	1.17	1.47
E	2.60	3.50
F	15.10	16.70
G	19.55MAX	
H	2.54REF	
I	0.70	0.95
J	9.35	11.00
K	4.30	4.77
L	1.20	1.45
M	0.40	0.65
N	2.20	2.60



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