

1.Description

The 20N06 uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications.

2.2Features

- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge

2.1Features

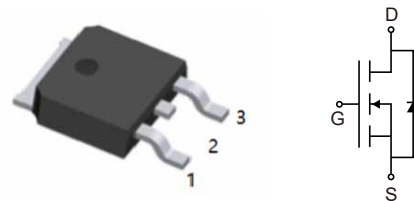
- $V_{DS(V)}=60V$
- $I_D=20A(V_{GS}=10V)$
- $R_{DS(ON)}<23m\Omega(V_{GS}=10V)$
- $R_{DS(ON)}<29m\Omega(V_{GS}=4.5V)$

- Lead free product is acquired

3.Pinning information

Pin	Symbol	Description
1	G	GATE
2	D	DRAIN
3	S	SOURCE

TO-252(DPAK)
top view



4.Absolute Maximum Ratings $T_A = 25^{\circ}C$

Parameter		Symbol	Rating	Units
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	± 20	
Drain Current-Continuous ^{Note3}	$T_C=25^{\circ}C$	I_D	20	A
	$T_C=100^{\circ}C$		14	
Drain Current-Pulsed ^{Note1}		I_{DM}	120	
Avalanche Energy ^{Note4}		E_{AS}	72	mJ
Maximum Power Dissipation	$T_C=25^{\circ}C$	P_D	55	W
Storage Temperature Range		T_{STG}	-55 to 150	$^{\circ}C$
Junction Temperature Range		T_J	-55 to 150	$^{\circ}C$



5.Thermal resist ance rating

Parameter	Symbol	Typ	Max	Units
Thermal Resistance,Junction-to-Case	$R_{\theta JC}$		2.7	°C/W



6.SPECIFICATIONS (T_J= 25°C, unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _{DS} =250μA	60			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =60V, V _{GS} =0V			1	μA
Gate-Body Leakage	I _{GSS}	V _{GS} =±20V, V _{DS} =0V			±100	nA
ON CHARACTERISTIC						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _{DS} =250μA	1	1.6	2.5	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _{DS} =15A		23	29	mΩ
		V _{GS} =4.5V, I _{DS} =10A		29	40	mΩ
DYNAMIC CHARACTERISTICS						
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f=1MHz		1562		pF
Output Capacitance	C _{oss}			75.4		pF
Reverse Transfer Capacitance	C _{rss}			66.8		pF
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	t _{D(on)}	V _{GS} =10V, V _{DS} =30V R _{GEN} =1.8Ω, I _D =15A		7.5		ns
Rise Time	t _r			21		ns
Turn-Off Delay Time	t _{D(off)}			16		ns
Fall Time	t _f			23.5		ns
Total Gate Charge at 10V	Q _g	V _{DS} =30V, I _{DS} =15A, V _{GS} =10V		25		nC
Gate to Source Gate Charge	Q _{gs}			4.5		nC
Gate to Drain“Miller”Charge	Q _{gd}			6.5		nC



DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_{DS}=15A$			1.2	V
Reverse Recovery Time	t_{rr}	$T_J=25^{\circ}C, I_F=15A$		29		nS
Reverse Recovery Charge	Q_{rr}			45		uC

Notes:

- 1: Repetitive rating, pulse width limited by maximum junction temperature.
- 2: Surface mounted on FR4 Board, $t_s \leq 10sec$.
- 3: Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
- 4: E_{AS} condition: $L=0.5mH, V_{DD}=30V, V_G=10V, V_{GATE}=60V, Start T_J=25^{\circ}C$.



7.1 Typical Characteristics

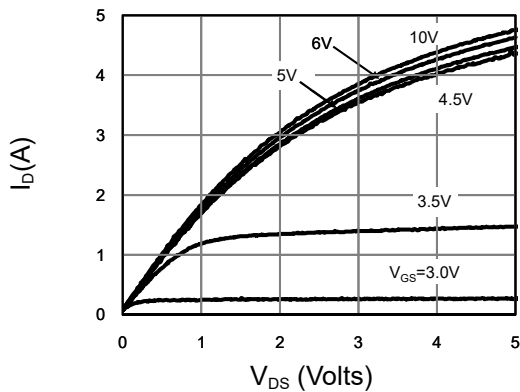


Fig 1: On-Region Characteristics (Note E)

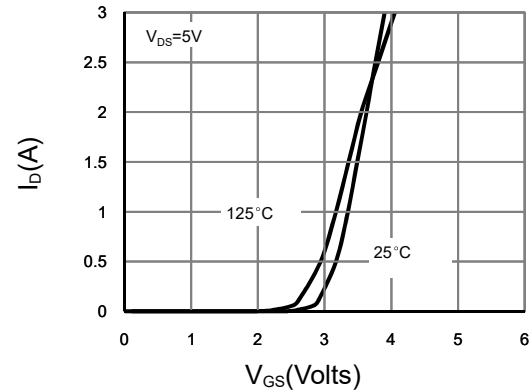


Figure 2: Transfer Characteristics (Note E)

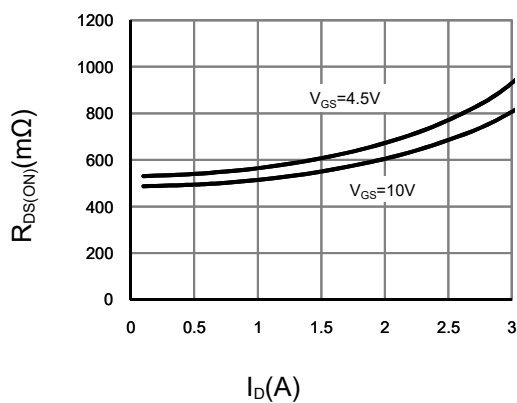


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

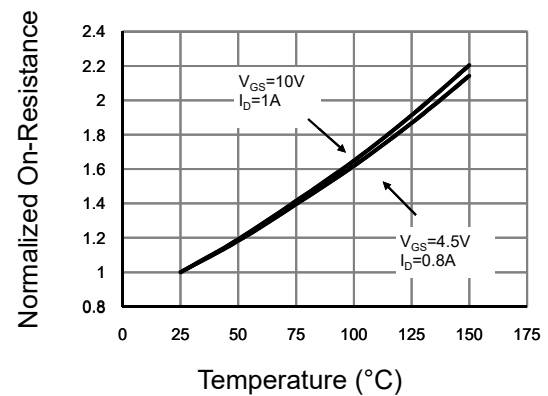


Figure 4: On-Resistance vs. Junction Temperature (Note E)

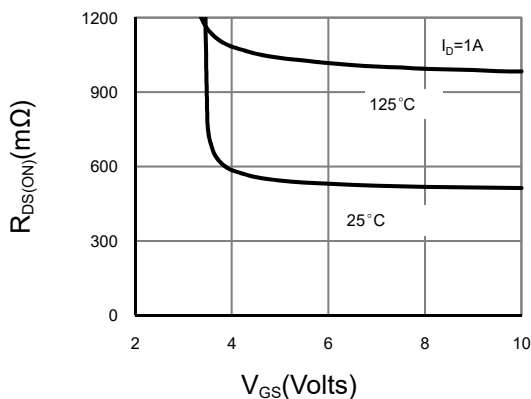


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

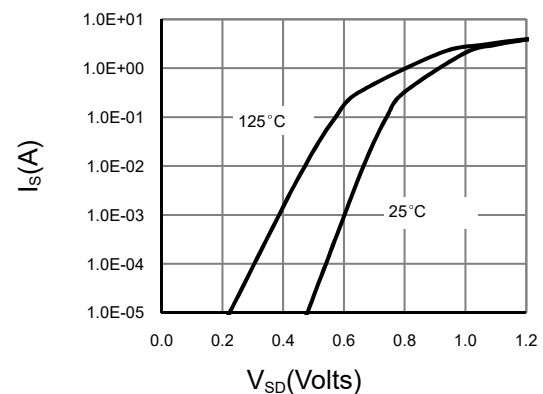


Figure 6: Body-Diode Characteristics (Note E)



7.2 Typical Characteristics

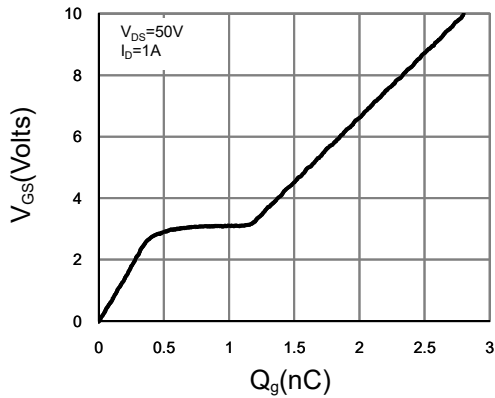


Figure 7: Gate-Charge Characteristics

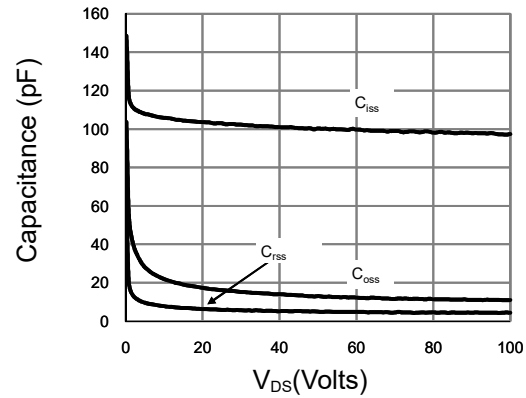


Figure 8: Capacitance Characteristics

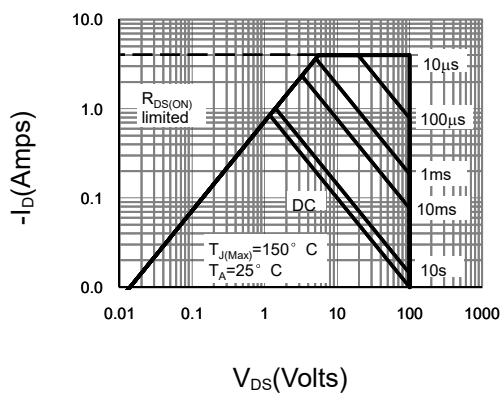


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

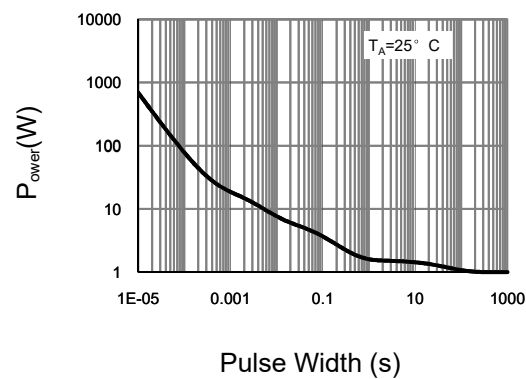


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note F)

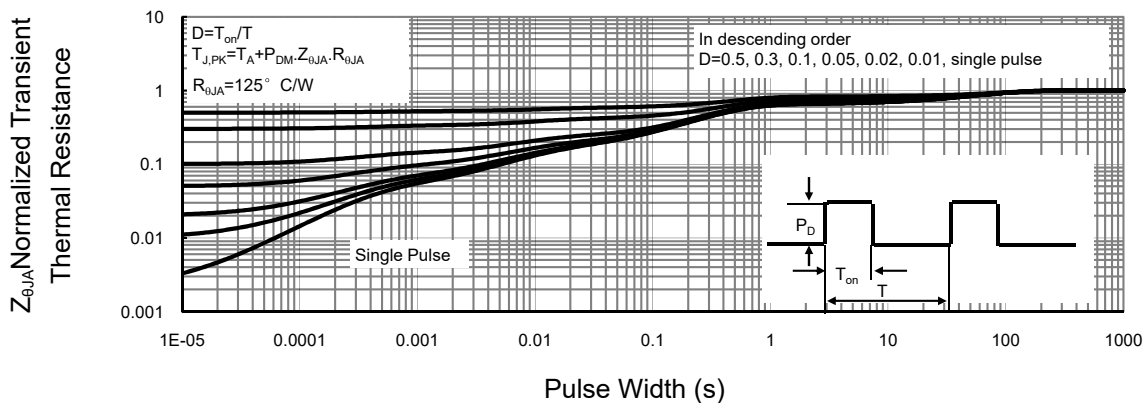
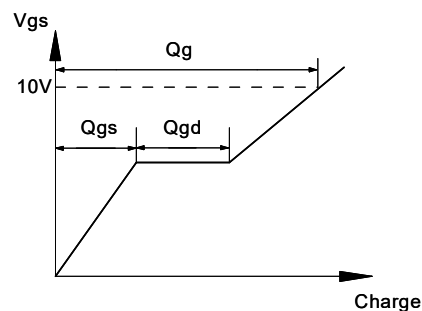
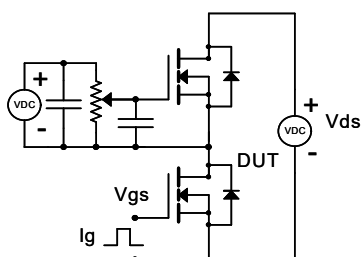


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

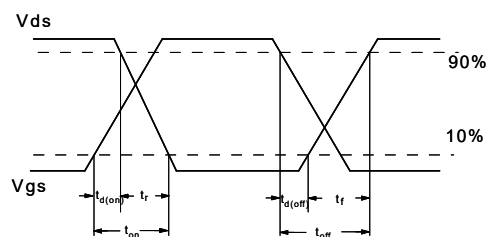
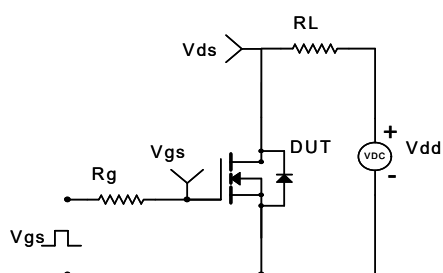


7.3 Typical Characteristics

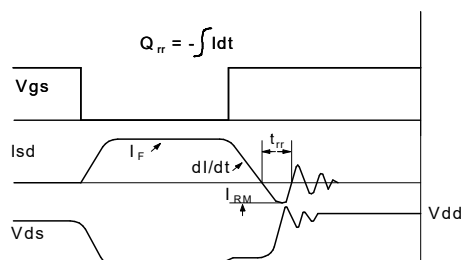
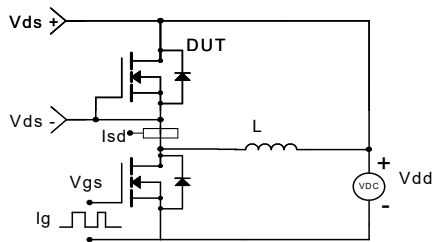
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

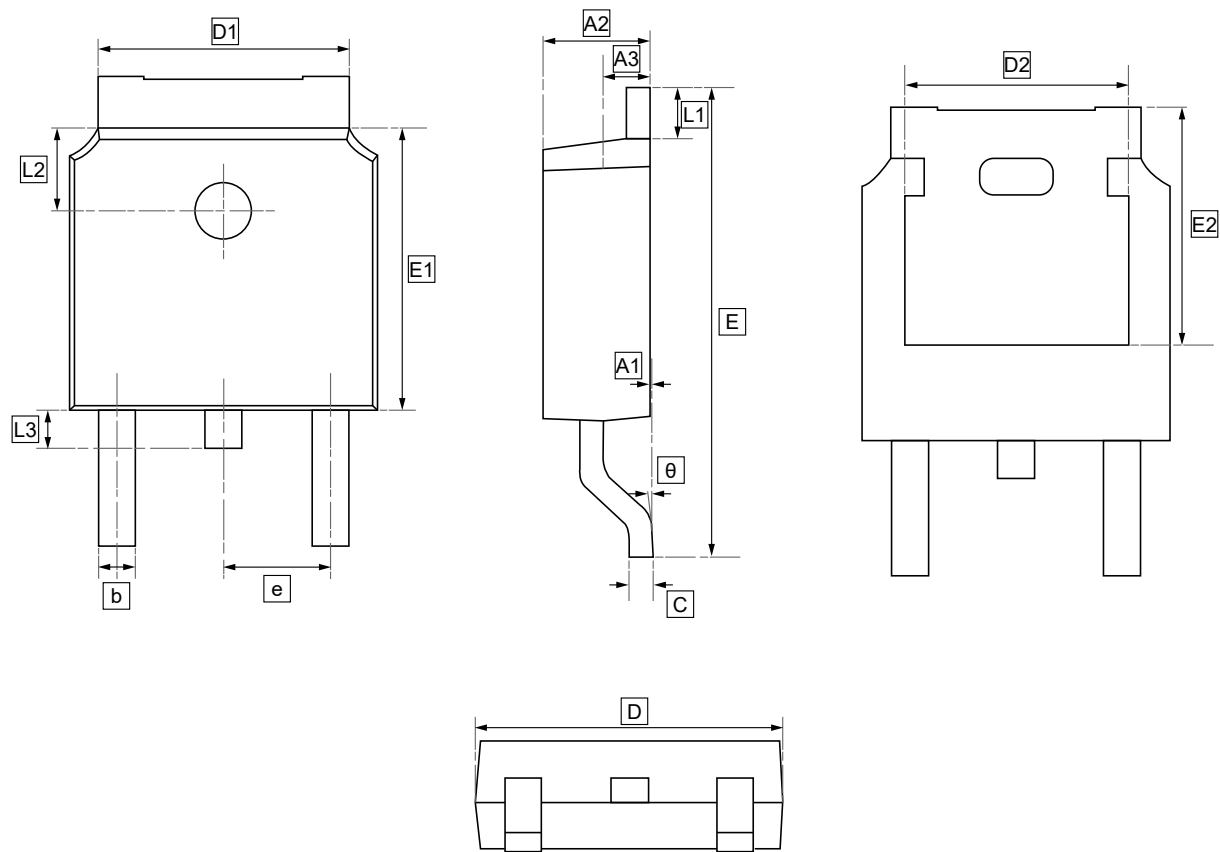


Diode Recovery Test Circuit & Waveforms





8.TO-252 Package Outline Dimensions

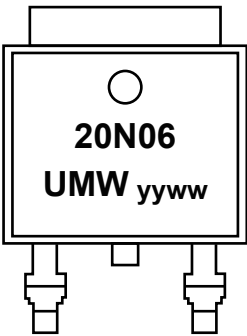


DIMENSIONS (mm are the original dimensions)

Symbol	A1	A2	A3	b	c	D	D1	D2	E	E1	E2	e	L1	L2	L3	θ
Min	0.00	2.18	0.90	0.65	0.46	6.35	4.95	4.32	9.40	5.97	5.21	2.286 BSC	0.89	1.70	0.60	0.00
Max	0.13	2.39	1.10	0.85	0.61	6.73	5.46	4.90	10.41	6.22	5.38		1.27	1.90	1.00	8.00



9.Ordering information



yy: Year Code
ww: Week Code

Order Code	Package	Base QTY	Delivery Mode
UMW 20N06	TO-252	2500	Tape and reel



10.Disclaimer

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