UMW IPB027N10N3 G

100V N-Channel MOSFET

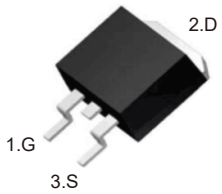
1.Features

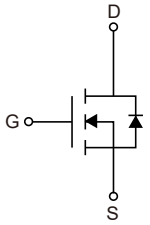
- $V_{DS\ (V)}$=100V
- I_D=120A
- $R_{DS(ON)}$<2.3mΩ(V_{GS}=10V)
- Excellent gate charge x $R_{(ON)}$ product (FOM)
- Very low on-resistance $R_{DS(ON)}$
- Ideal for high-frequency switching and synchronous rectification

2.Pinning information

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

TO-263





3.Absolute Maximum Ratings T_J= 25°C

Parameter	Symbol	Conditions	Value	Units
Continuous drain current	I_D	T_C=25°C[2)]	120	A
		T_C=100°C	120	A
Pulsed drain current [2)]	$I_{D,pulse}$	T_C=25°C	480	A
Avalanche current, single pulse	E_{AS}	I_D=100A, R_{GS}=25Ω	1000	mJ
Gate source voltage	V_{GS}		±20	V
Power dissipation	P_{tot}	T_C=25°C	300	W
Storage temperature	T_J,T_{STG}		-55 to 175	°C
IEC cimatic category; DIN IEC 68-1			55/175/56	

4.Electrical Characteristic (T_J=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Thermal resistance, junction -case	R_{thJC}				0.5	K/W
Thermal resistance, junction - ambient	R_{thJA}	minimal footprint			62	K/W
		6 cm^2 cooling area [3])			40	K/W
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=1mA	100			V
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=275μA	2	2.7	3.5	V
Zero gate voltage drain current	I_{DSS}	V_{DS}=100V, V_{GS}=0V, T_J=25°C		0.1	1	μA
		V_{DS}=100V, V_{GS}=0V, T_J=125°C		10	100	μA
Gate-source leakage current	I_{GSS}	V_{GS}=20V, V_{DS}=0V		1	100	nA
Drain-source on-state resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=100A		2.3	2.7	mΩ
		V_{GS}=6V, I_D=50A		2.8	4.5	mΩ
Gate resistance	R_G			1.9		Ω
Transconductance	g_{FS}	$\|V_{DS}\|>2\|I_D\|R_{DS(ON)max}$,$I_D$=100A	94	188		S
Input capacitance	C_{iss}	V_{GS}=0V, V_{DS}=50V, f=1MHz		11100	14800	pF
Output capacitance	C_{oss}			1940	2580	pF
Reverse transfer capacitance	C_{rss}			69		pF
Turn-on delay time	$t_{D(on)}$	V_{DD}=50V, V_{GS}=10V I_D=100A, $R_{G,ext}$=1.6Ω		34		ns
Rise time	t_r			58		ns
Turn-off delay time	$t_{D(off)}$			84		ns
Fall time	t_f			28		ns
Gate to source charge	Q_{gs}	V_{DD}=50V, I_D=100A V_{GS}=0 to 10V		48		nC
Gate to drain charge	Q_{gd}			27		nC
Switching charge	Q_{SW}			42		nC
Gate charge total	Q_g			155	206	nC
Gate plateau voltage	$V_{plateau}$			4.3		V

Output charge	Q_{oss}	V_{DD}=50V, V_{GS}=0V		205	273	nC
Diode continous forward current	I_S	T_C=25°C			120	A
Diode pulse current	$I_{S,pulse}$				480	A
Diode forward voltage	V_{SD}	V_{GS}=0V, I_F=100A, T_J=25°C		1	1.2	V
Reverse recovery time	t_{rr}	V_R=50V, I_F=100A, di_F/dt=100A/μs		86		ns
Reverse recovery charge	Q_{rr}			232		nC

Notes:

Device on 40 mm x 40 mm x 1.5 mm epoxy PCB FR4 with 6 cm2 (one layer , 70 um thick) copper area for drainconnection .

PCB is vertical in still air.

5.1Typical characteristic

$P_{tot}=f(T_C)$

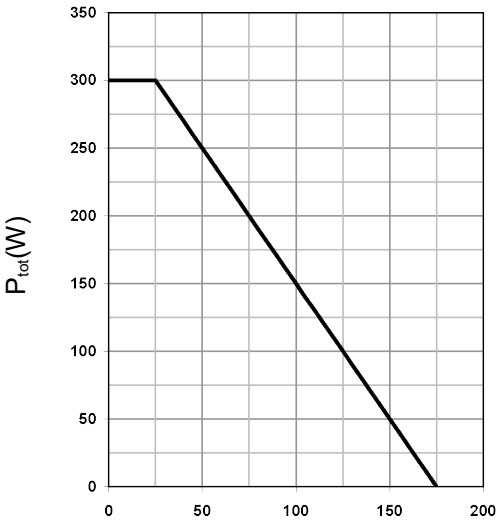


Fig 1. Power dissipation

$I_D=f(T_C)$; $V_{GS}\geq 10V$

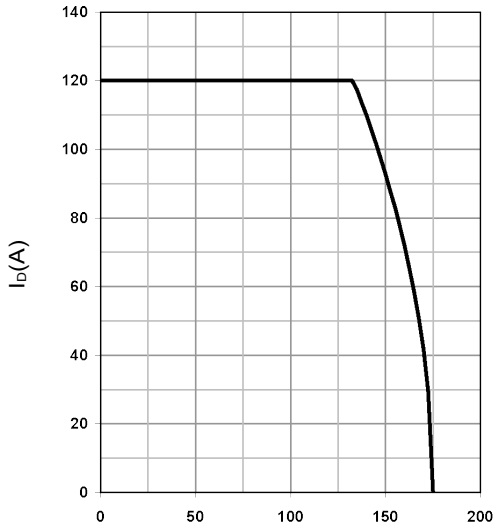


Fig 2. Drain current

ID=f(V_{DS}); T_C=25°C; D=0; parameter: t_p

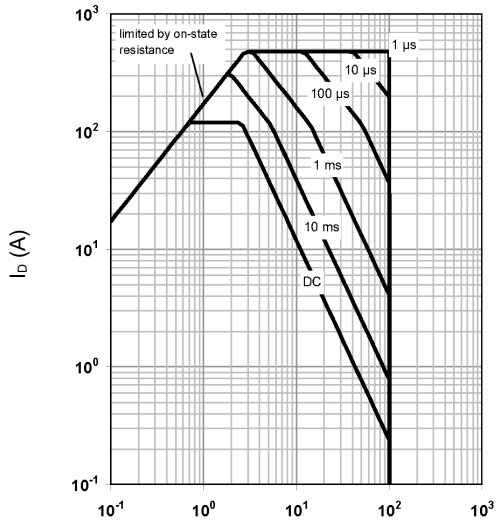


Fig 3. Safe operating area

$Z_{thJC}=f(t_p)$; parameter: $D=t_p/T$

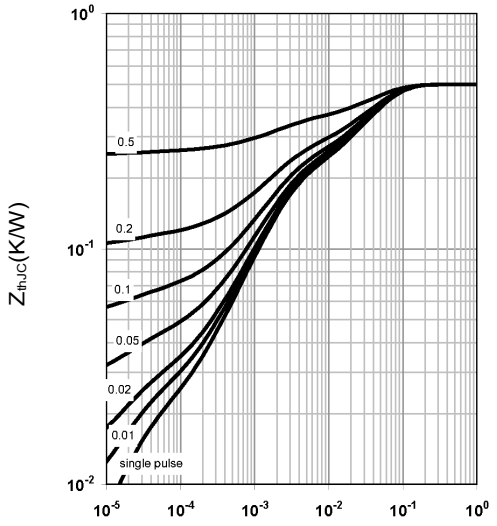


Fig 4. Max transient thermal impedance

5.2Typical characteristic

$I_D=f(V_{DS})$; T_J=25°C; parameter: V_{GS}

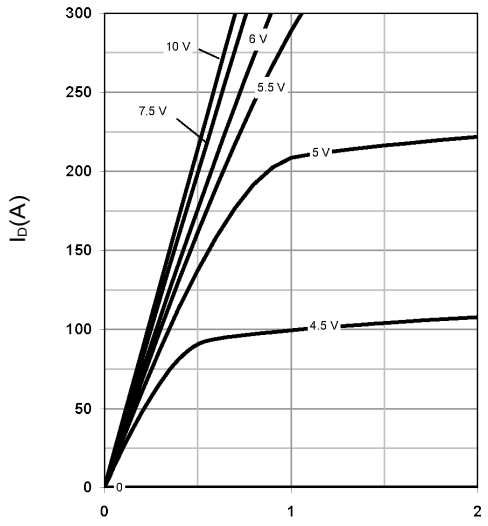


Fig 5. output characteristics

$R_{DS(ON)}=f(I_D)$; T_J=25°C; parameter: V_{GS}

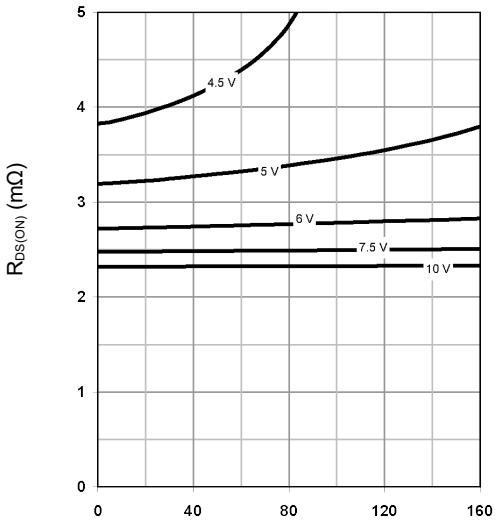


Fig 6. drain-source on resistance

ID=f(V_{GS}); |V_{DS}|>2| I_D |$R_{DS(ON)max}$; parameter: T_J

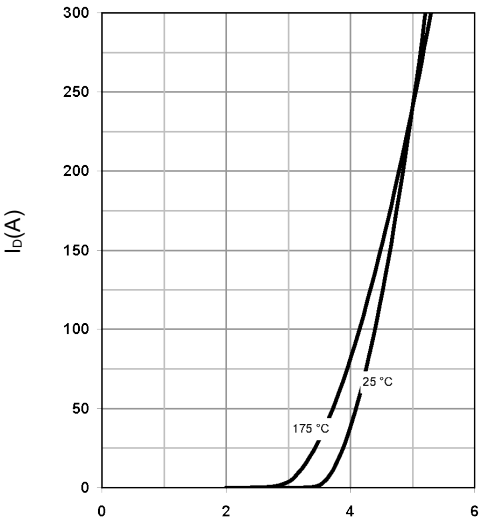


Fig 7. transfer characteristics

$g_{fs}=f(I_D)$; T_J=25°C

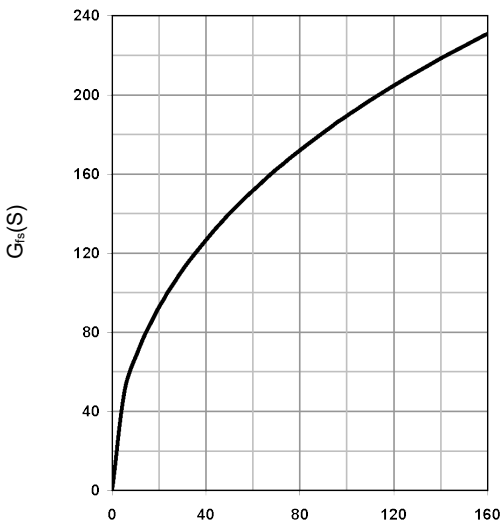


Fig 8. forward transconductance

5.3Typical characteristic

$R_{DS(ON)}=f(T_J)$; I_D=100A; V_{GS}=10V

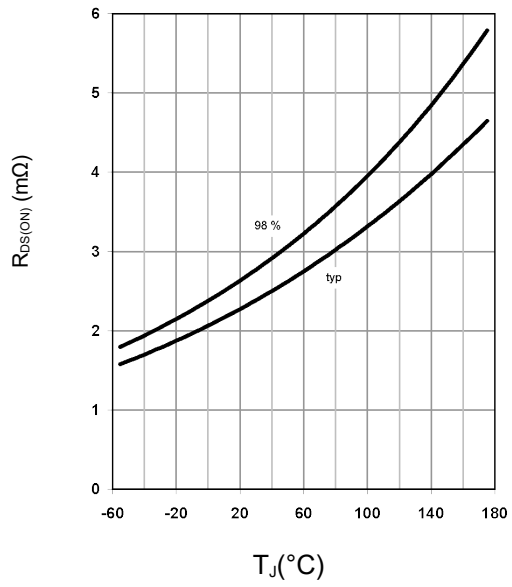


Fig 9. Drain-source on-state resistance

$V_{GS(th)}=f(T_J)$; $V_{GS}=V_{DS}$; parameter: I_D

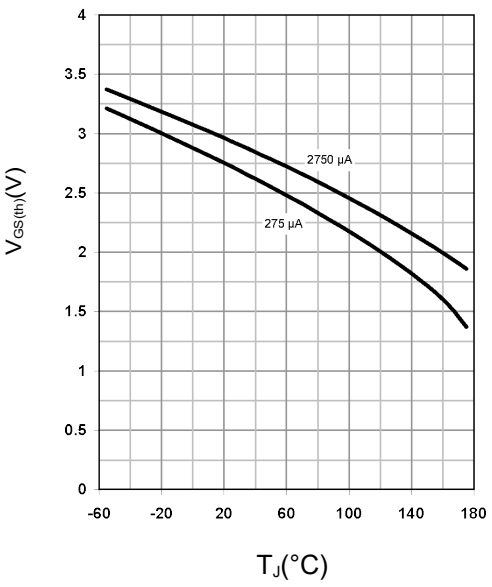


Fig 10. Gate threshold voltage

C=f(V_{DS}); V_{GS}=0V; f=1MHZ

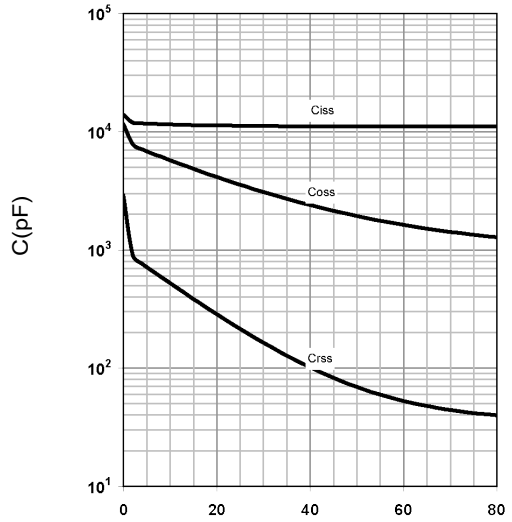


Fig 11. capacitances

$I_F=f(V_{SD})$; parameter: T_J

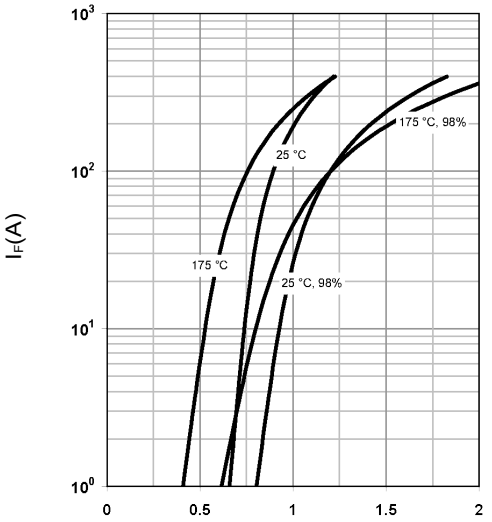


Fig 12. Forward characteristics of reverse diode

5.4Typical characteristic

$I_{AS}=f(t_{AV})$; $R_{GS}=25\Omega$; parameter: $T_{j(start)}$

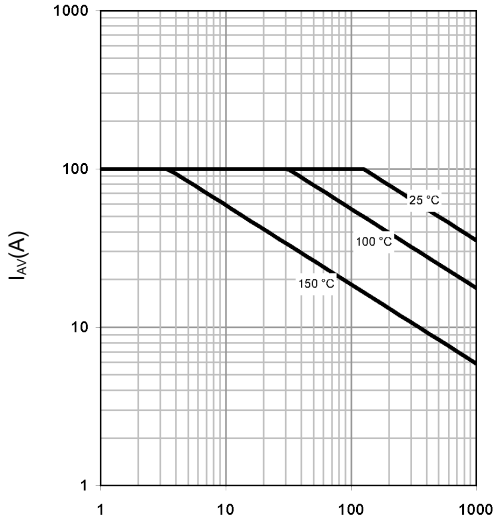


Fig 13. Avalanche characteristics

$V_{GS}=f(Q_{gate})$; $I_D=100A$pulsed; parameter: V_{DD}

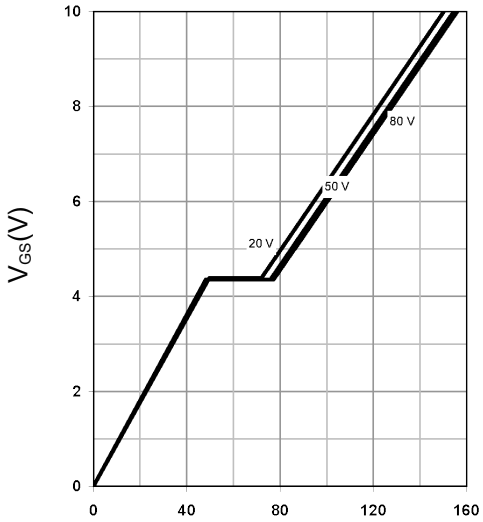


Fig 14. gate charge

$V_{BR(DSS)}=f(T_J)$; $I_D=1m$ A

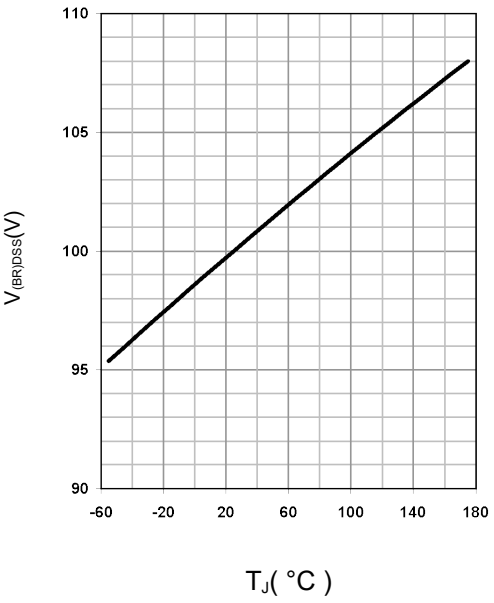


Fig 15. drain source breakdown voltage

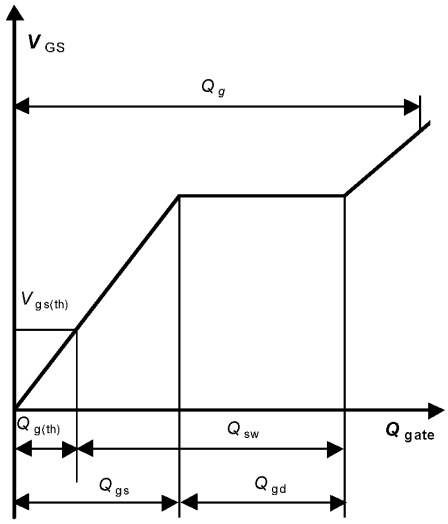
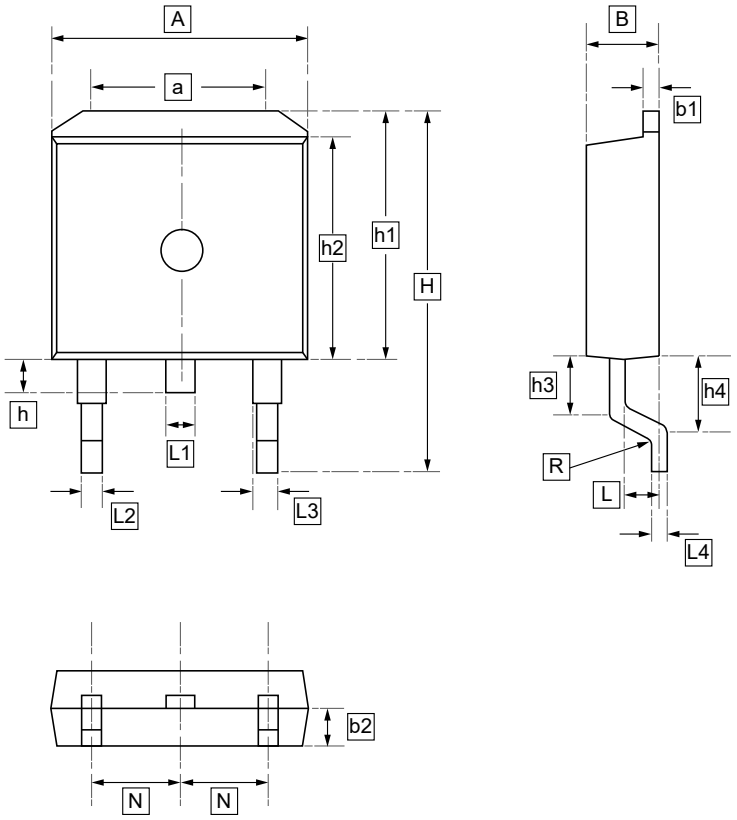


Fig 16. Gate charge waveforms

6.TO-263 Package Outline Dimensions

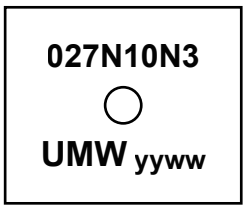


DIMENSIONS (mm are the original dimensions)

Symbol	A	a	B	b1	b2	H	h	h1	h2	h3	h4	L	L1	L2	L3
Min	9.6	7.2	4.3	1.25	2.2	15.2	1.34	10.3	9.1	1.34	2.5	2.2	1.2	0.7	1.2
Max	10.0	7.6	4.7	1.35	2.6	15.8	1.74	10.7	9.3	1.74	2.9	2.6	1.4	0.9	1.4

Symbol	L4	N	R
Min	0.4	2.4	0.45
Max	0.6	2.5	0.55

7.Ordering information



yy: Year Code
ww: Week Code

Order Code	Package	Base QTY	Delivery Mode
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