DESCRIPTION

The MXB027N08 uses deep trench technology to provide excellent $R_{DS(ON)}$ and low gate charge. It can be used in a wide variety of applications.

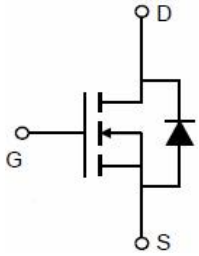
GENERAL FEATURES

- V_{DS}=85V, I_D=200A
  $R_{DS(ON)}$(Typ.)=2.7mΩ @ V_{GS}=10V
- High Power and current handing capability
- Lead free product is acquired
- Suface Mount Package

APPLICATION

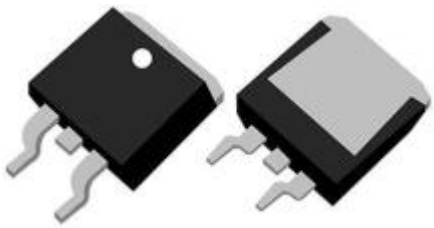
- PWM applications
- Load switch
- Power management

PINOUT



Schematic diagram

Marking and pin Assignment


TO-263 top & bottom view

ORDERING INFORMATION

Part Number	StorageTemperature	Package	Devices Per Reel
MXB027N08	-55°C to 175°C	TO-263	800

ABSOLUTE MAXIMUM RATINGS(T_C=25°C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	85	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous	I_D	200	A
Drain Current-Continuous(T_C=100°C)	I_D	144	A
Pulsed Drain Current(Note1)	I_{DM}	800	A
Maximum Power Dissipation	P_D	345	W
Avalanche Energy(L=0.5mH)	E_{AS}	1450	mJ
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 175	°C

THERMAL RESISTANCE

Thermal Resistance, Junction-to-Case(Note2)	$R_{\theta JC}$	0.43	°C/W

Note 1. Repetitive Rating: Pulse width limited by maximum junction temperature.
Note 2. Surface Mounted on FR4 Board, t ≤ 10 sec.

ELECTRICAL CHARACTERISTICS(T_C=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250μA	85	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=80V, V_{GS}=0V	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
On Characteristics(Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	2.4	3.0	3.8	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=80A	2.3	2.7	3.2	mΩ
Forward Transconductance	g_{FS}	V_{DS}=5V, I_D=40A	-	60	-	S
Dynamic Characteristics(Note4)						
Input Capacitance	C_{iss}	V_{DS}=40V, V_{GS}=0V, F=1.0MHz	-	5000	-	pF
Output Capacitance	C_{oss}		-	980	-	pF
Reverse Transfer Capacitance	C_{rss}		-	40	-	pF
Gate Resistance	R_g	V_{DS}=0V, V_{GS}=0V, F=1.0MHz	-	0.5	-	Ω
Switching Characteristics(Note4)						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=40V,I_D=10A, R_L=1Ω, V_{GS}=10V,R_G=3Ω	-	24	-	nS
Turn-on Rise Time	t_r		-	18	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	55	-	nS
Turn-Off Fall Time	t_f		-	17	-	nS
Total Gate Charge	Q_g	V_{DS}=40V, I_D=100A, V_{GS}=10V	-	127	-	nC
Gate-Source Charge	Q_{gs}		-	35	-	nC
Gate-Drain Charge	Q_{gd}		-	21	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage(Note 3)	V_{SD}	V_{GS}=0V, I_S=10A	-	-	1.2	V
Diode Forward Current(Note 2)	I_S		-	-	200	A

Note 2. Surface Mounted on FR4 Board, t ≤ 10 sec.
Note 3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
Note 4. Guaranteed by design, not subject to product.

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

Figure 1. Switch Test Circuit

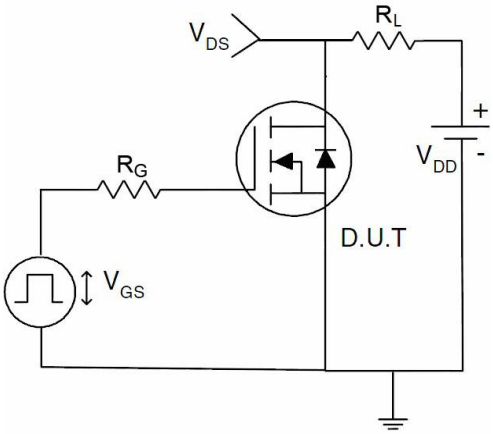


Figure 2. Switching Waveform

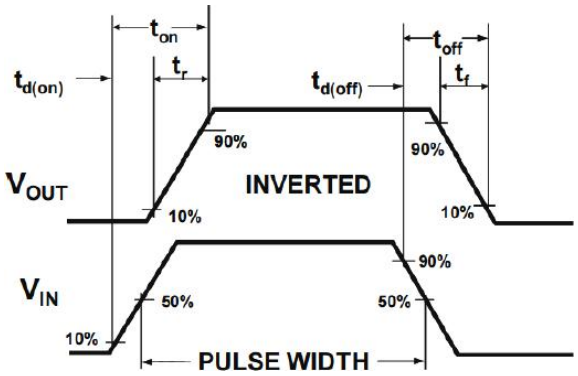


Figure 3. Power De-rating

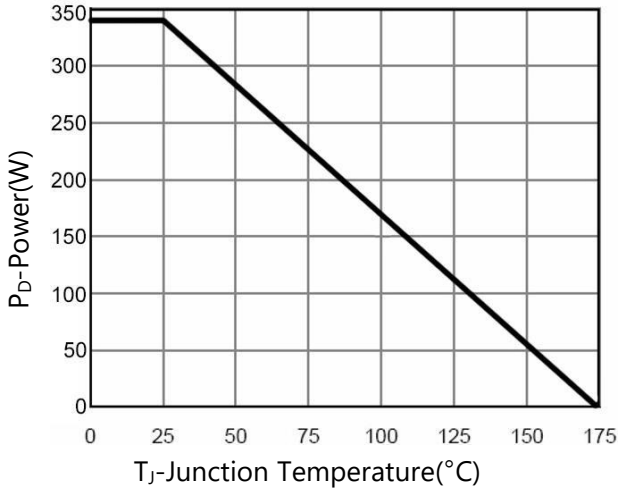


Figure 4. Drain Current

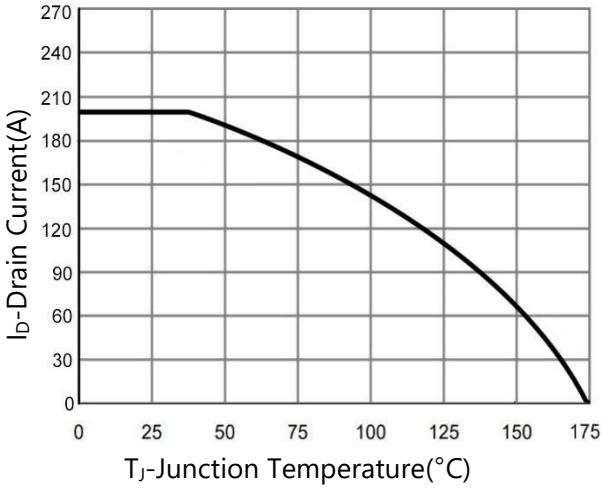


Figure 5. Output Characteristics

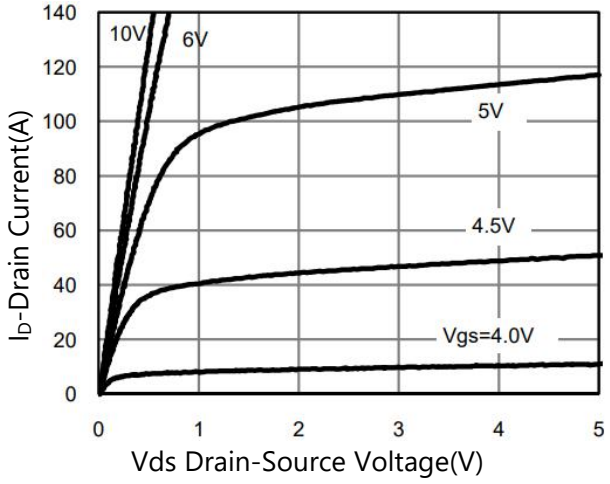
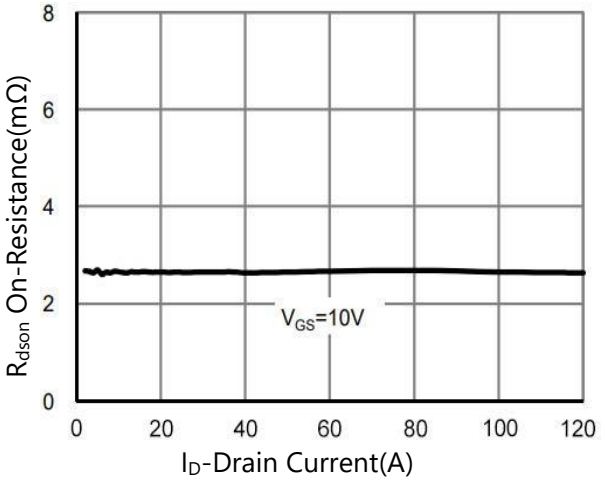


Figure 6. R_{dson} vs Drain Current



TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

Figure 7. Transfer Characteristics

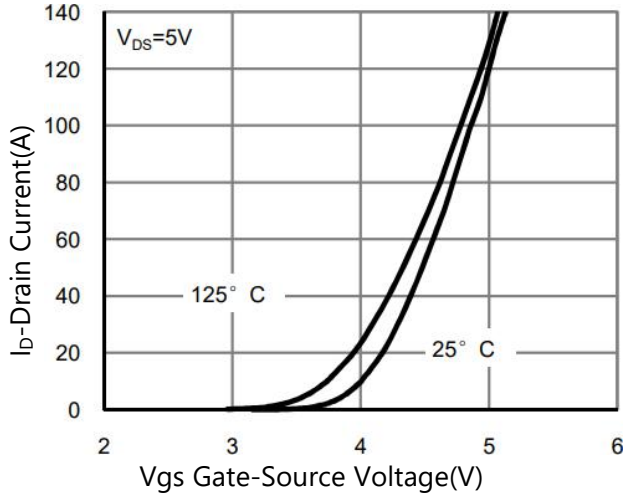


Figure 8. R_{dson} vs Junction Temperature

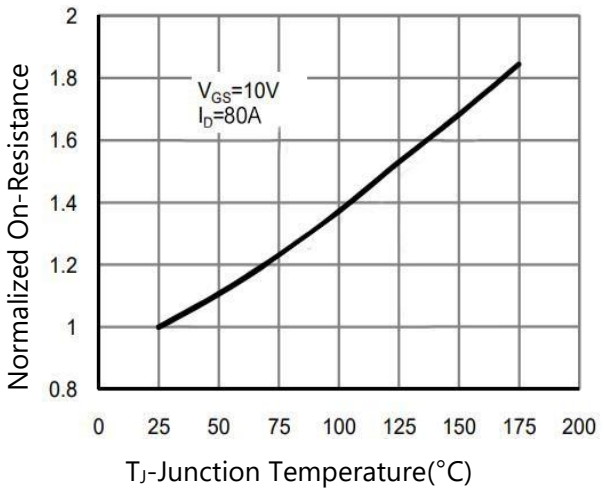


Figure 9. R_{dson} vs V_{gs}

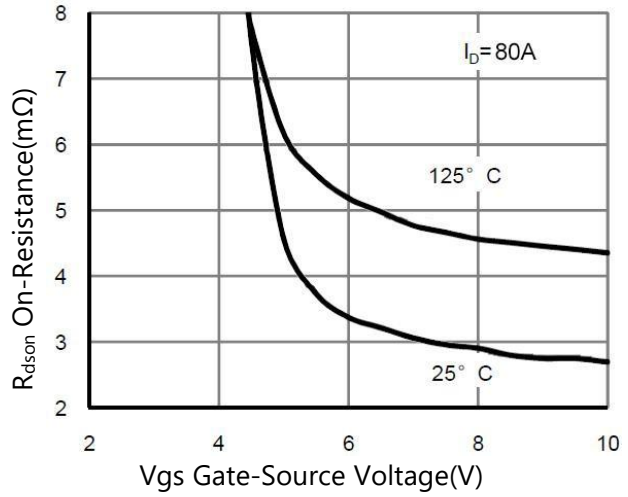


Figure 10. Capacitance vs V_{ds}

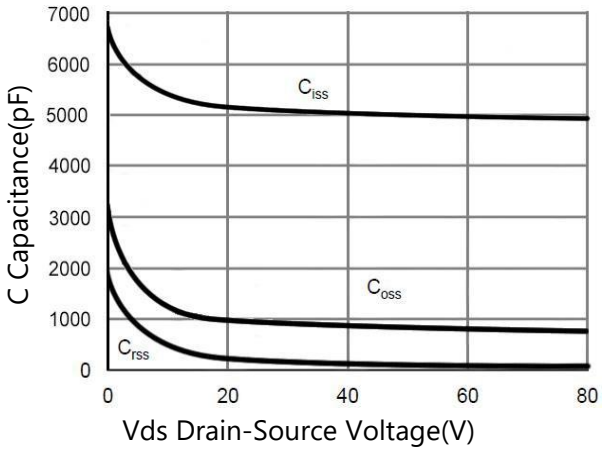


Figure 11. R_{dson} vs V_{gs}

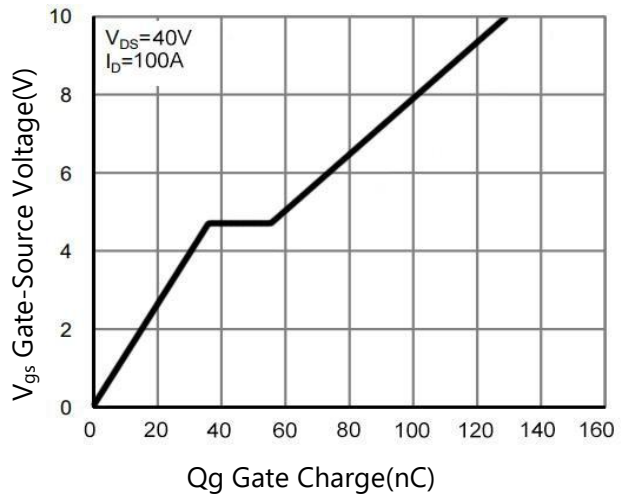
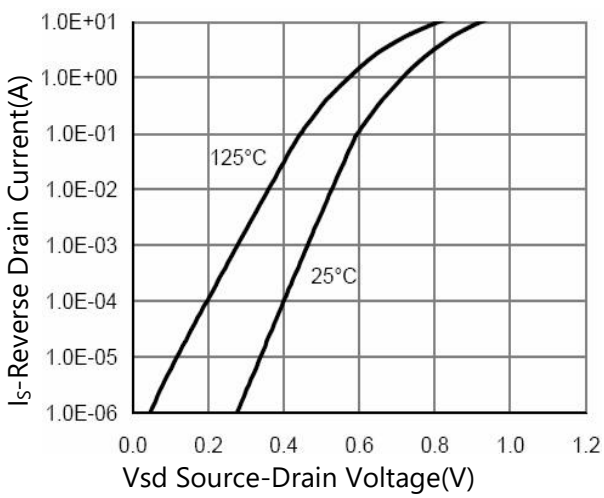


Figure 10. Source- Drain Diode Forward



TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

Figure13. Safe Operation Area

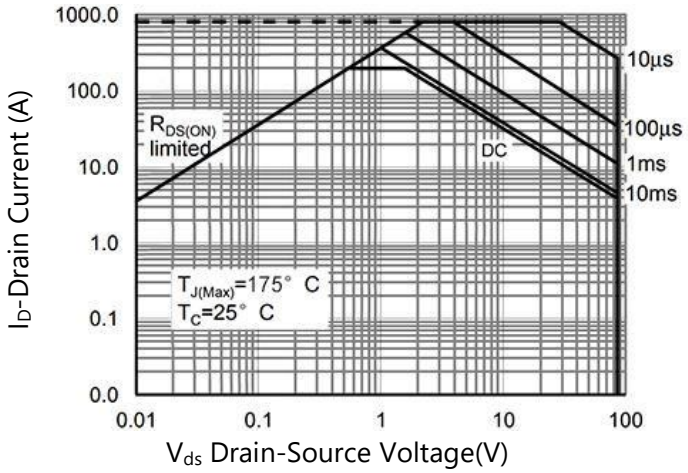
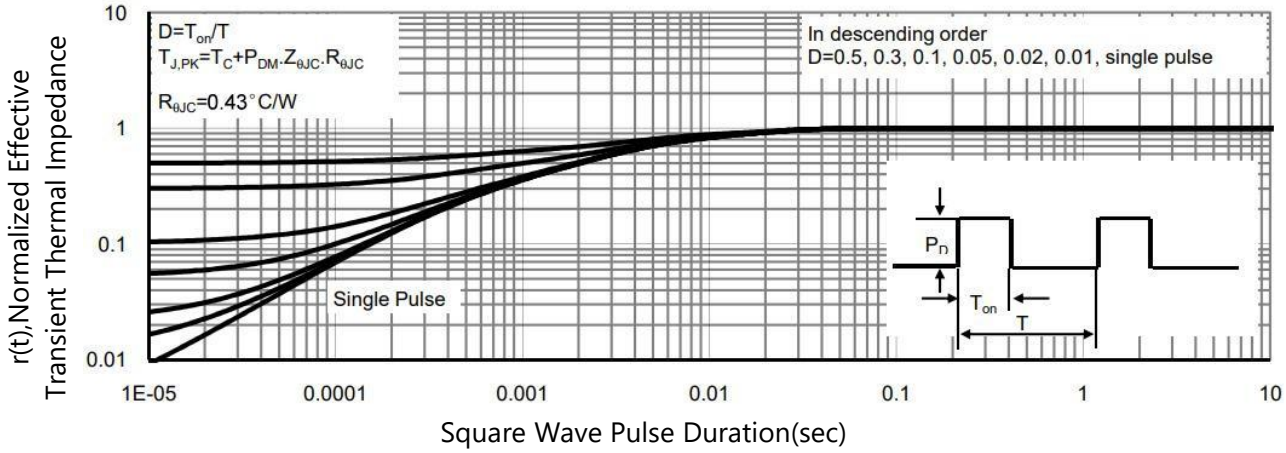
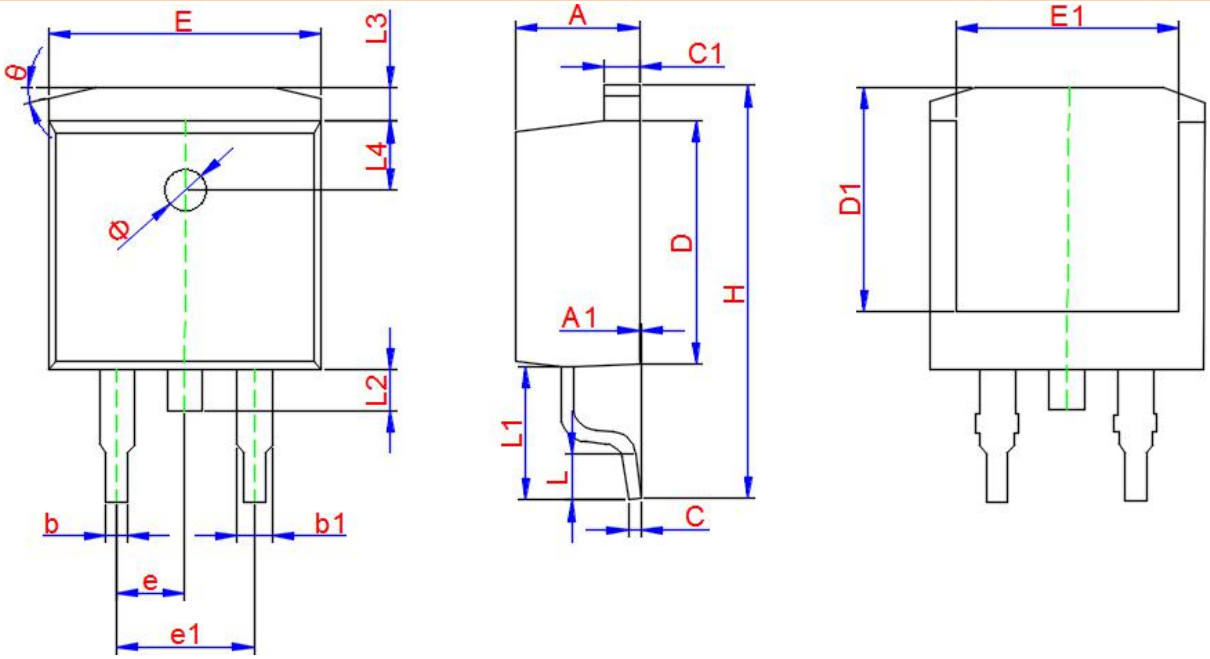


Figure14. Normalized Maximum Transient Thermal Impedance



PACKAGE INFORMATION

TO-263



Symbol	Dimensions In Millimeters		
	Min.	Typ.	Max.
A	4.300	4.500	4.700
A1	0.000	-	0.250
b	0.700	0.800	0.900
b1	1.200	1.300	1.400
c	0.400	0.470	0.550
c1	1.250	1.300	1.350
D	9.000	9.100	9.200
D1	8.000	8.100	8.200
H	14.90	15.20	15.50
E	9.800	10.00	10.20
E1	7.850	8.000	8.150
e1	4.930	5.080	5.230
L	2.000	2.200	2.450
L1	4.600	4.800	5.000
L2	1.300	1.500	1.700
L3	1.150	1.250	1.350
L4	2.400	2.500	2.600
Φ	1.5TYP.		
e	2.54TYP.		
θ	13°TYP.		