

DESCRIPTION

The MXB1R5N10D uses advanced trench technology to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications.

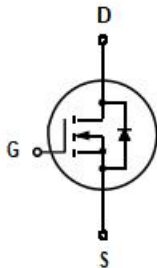
GENERAL FEATURES

- $V_{DS}=100V$, $I_D=250A$
 $R_{DS(ON)}(Typ.)=2.2m\Omega$ @ $V_{GS}=6V$
 $R_{DS(ON)}(Typ.)=1.7m\Omega$ @ $V_{GS}=10V$
- Surface-mounted package
- Advanced trench cell design
- Super Trench

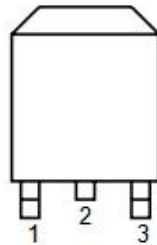
APPLICATION

- LCD TV appliances
- High Power inverter system
- LCDM appliances

PINOUT



Schematic diagram



Top View TO263-2L

Pin	Description
1	Gate(G)
3	Source(S)
2	Drain(D)

ORDERING INFORMATION

Part Number	Storage Temperature	Package	Devices Per Reel
MXB1R5N10D	-55°C to 150°C	TO263	800

ABSOLUTE MAXIMUM RATINGS ($T_C=25^\circ C$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current ($V_{GS}=10V$) ^{(Note1)(Note3)}	I_D	250	A
Drain Current ($V_{GS}=10V$, $T_C=100^\circ C$) ^{(Note1)(Note3)}	I_D	120	A
Pulsed Drain Current ($V_{GS}=10V$) ^{(Note1)(Note2)(Note3)}	I_{DM}	250	A
Continuous-Source Current	I_S	250	A
Drain Power Dissipation ^(Note1)	P_{tot}	156	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^\circ C$
Single Pulsed Avalanche Energy ^(Note1)	E_{AS}	928	mJ
Thermal Resistance, Junction-to-Ambient ^(Note1)	$R_{\theta JA}$	62.5	$^\circ C/W$
Thermal Resistance, Junction-to-Case ^(Note1)	$R_{\theta JC}$	0.8	$^\circ C/W$

Note 1. Surface Mounted on 1 in² pad area, $t \leq 10$ sec

Note 2. Pulse width $\leq 10\mu s$, duty cycle $\leq 1\%$

Note 3. limited by bonding wire



N-Channel Enhancement Mode Power MOSFET **MXB1R5N10D**



ELECTRICAL CHARACTERISTICS ($T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
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Off Characteristics

Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	100	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=80V, V_{GS}=0V$	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA

On Characteristics

Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2	-	4	V
Drain-Source On-State Resistance ^(Note1)	$R_{DS(on)}$	$V_{GS}=6V, I_D=30A$	-	2.2	2.9	m Ω
		$V_{GS}=10V, I_D=50A$	-	1.7	2.1	m Ω

Dynamic Characteristics^(Note2)

Input Capacitance	C_{iss}	$V_{DS}=50V, V_{GS}=0V, F=1.0MHz$	-	13416	-	pF
Output Capacitance	C_{oss}		-	2090	-	pF
Reverse Transfer Capacitance	C_{rss}		-	143	-	pF

Switching Characteristics^(Note2)

Turn-on Delay Time	$t_{d(on)}$	$V_{DS}=50V, I_{DS}=50A, V_{GEN}=10V, R_G=3.9\Omega, R_L=1\Omega,$	-	42	-	nS
Turn-on Rise Time	t_r		-	158	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	156	-	nS
Turn-Off Fall Time	t_f		-	152	-	nS
Total Gate Charge	Q_g	$V_{DS}=50V, I_{DS}=50A, V_{GS}=10V$	-	243	-	nC
Gate-Source Charge	Q_{gs}		-	75	-	nC
Gate-Drain Charge	Q_{gd}		-	67	-	nC

Drain-Source Diode Characteristics

Diode Forward Voltage ^(Note1)	V_{SD}	$V_{GS}=0V, I_{SD}=50A$	-	-	1.3	V
Reverse Recovery Time	t_{rr}	$V_{GS}=0V, I_{DS}=50A, di/dt=100A/\mu s$	-	123	-	nS
Reverse Recovery Charge	Q_{rr}		-	342	-	nC

Note 1. The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$

Note 2. Guaranteed by design, not subject to production testing



TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

Figure 1. Power Capability

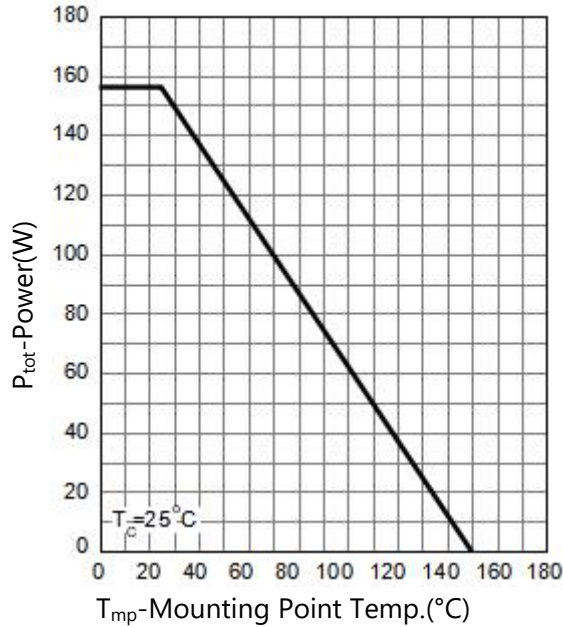


Figure 2. Current Capability

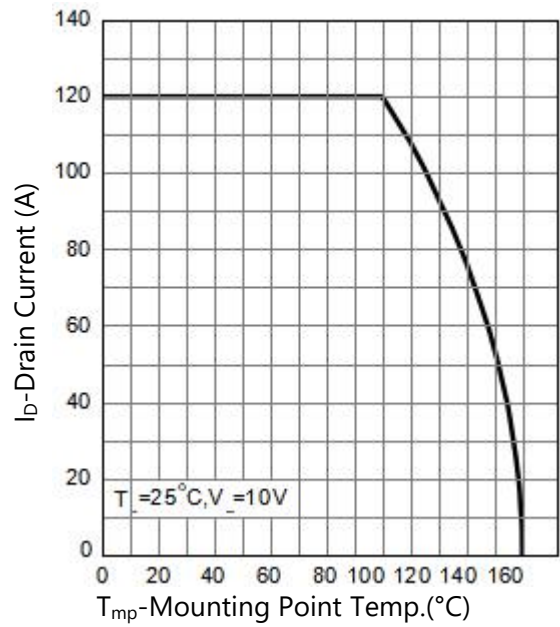


Figure 3. Safe Operation Area

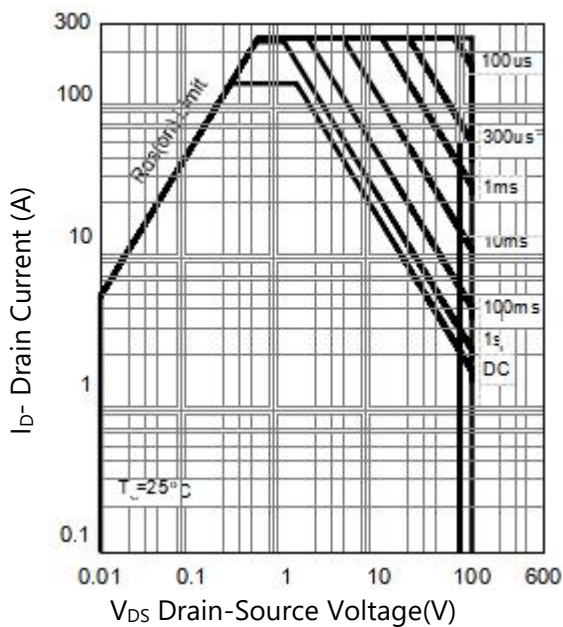
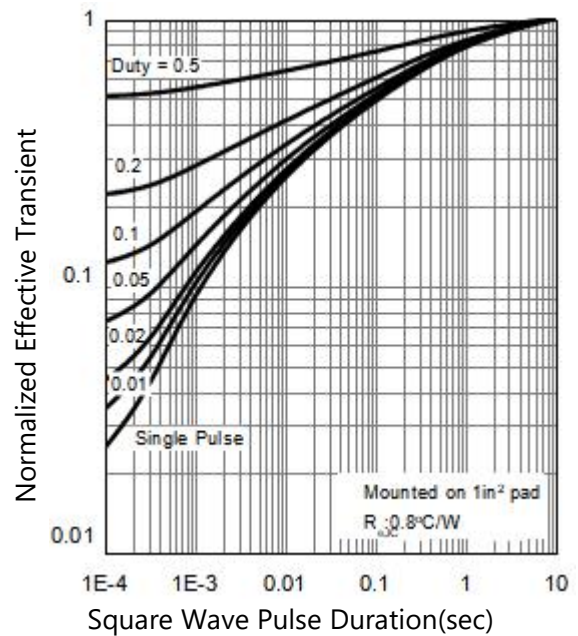


Figure 4. Transient Thermal Impedance





TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

Figure 5. Output Characteristics

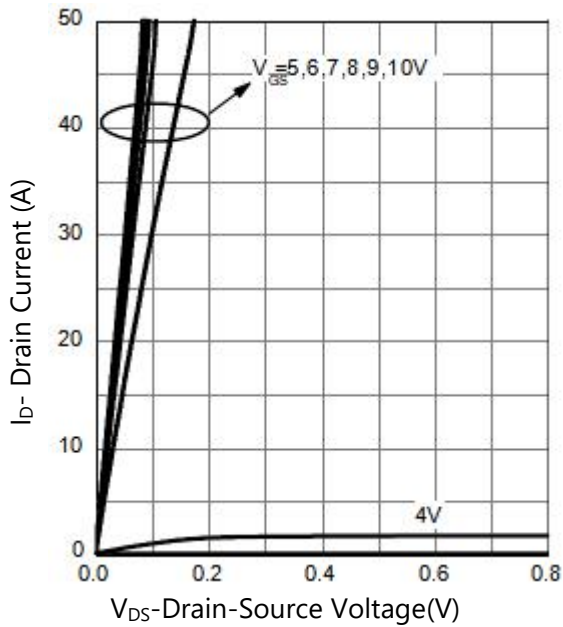


Figure 6. On Resistance

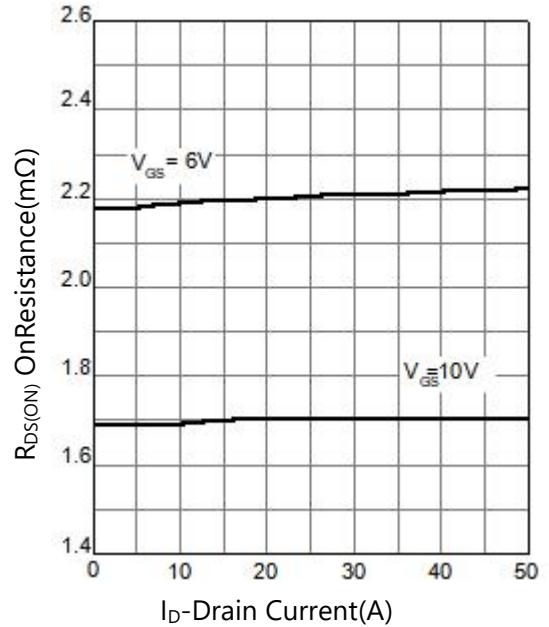


Figure 7. Transfer Characteristics

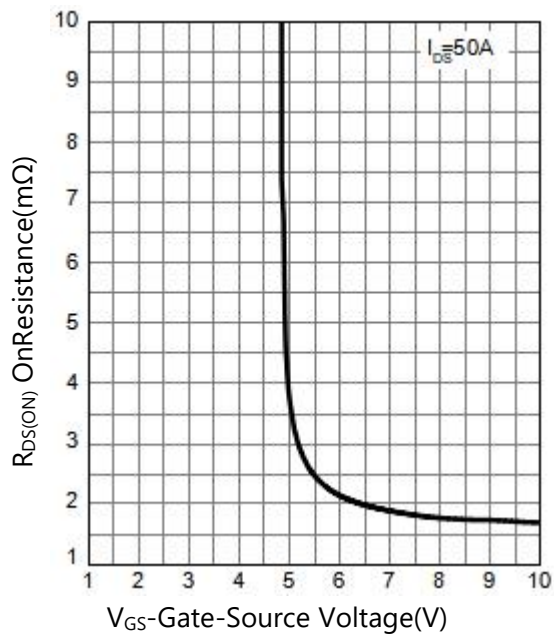
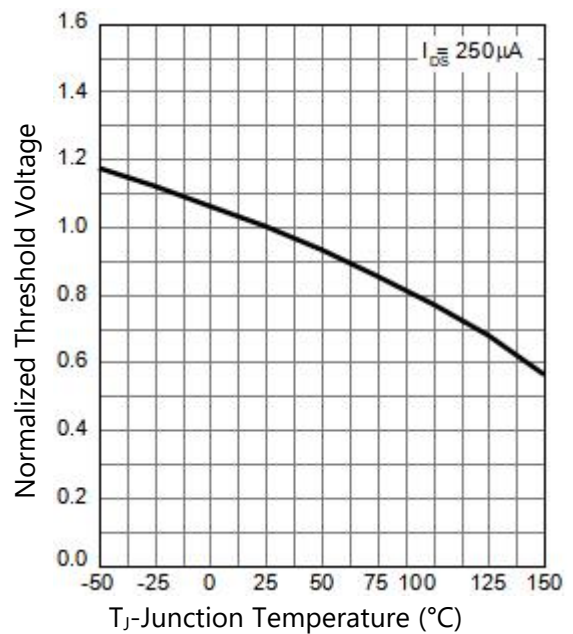


Figure 8. Normalized Threshold Voltage





TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

Figure 9. Normalized On Resistance

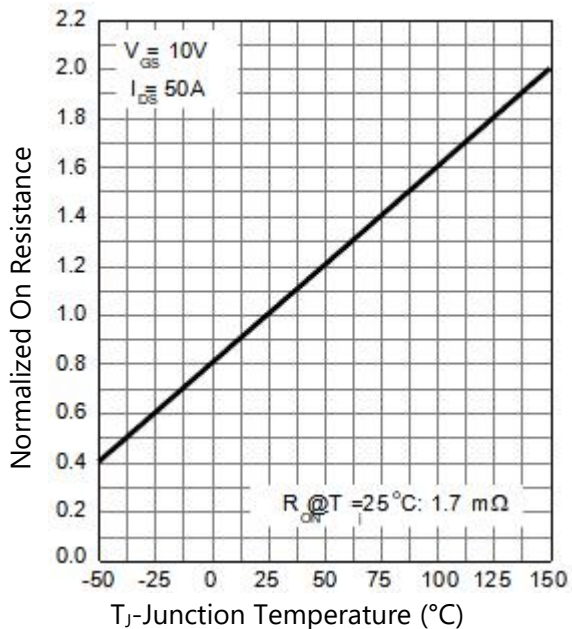


Figure 10. Diode Forward Current

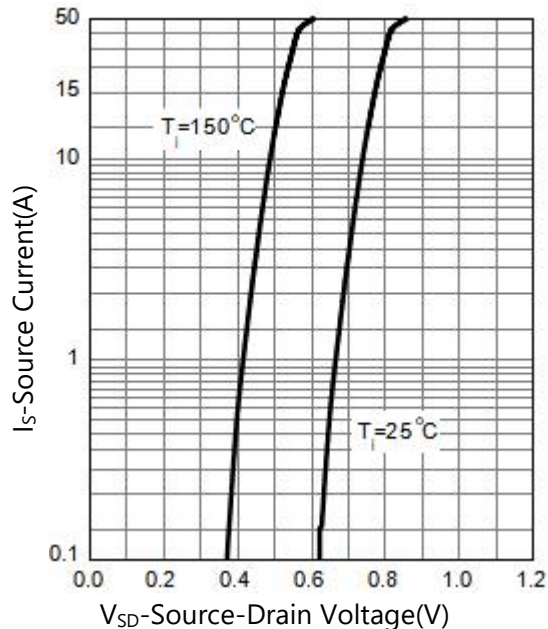


Figure 11. Capacitance

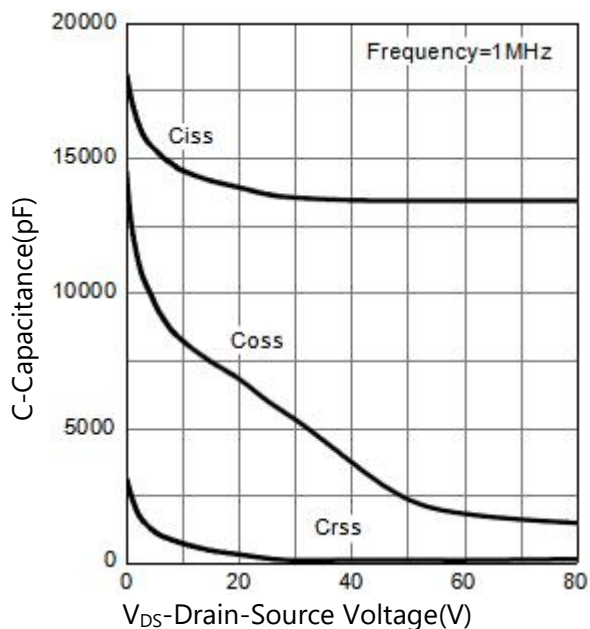
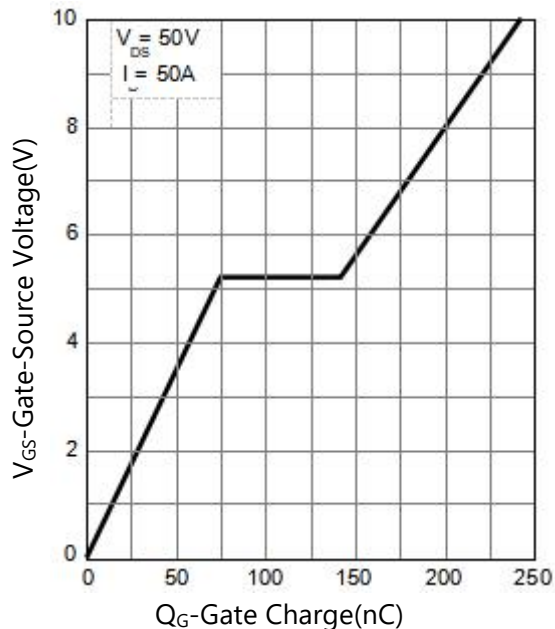
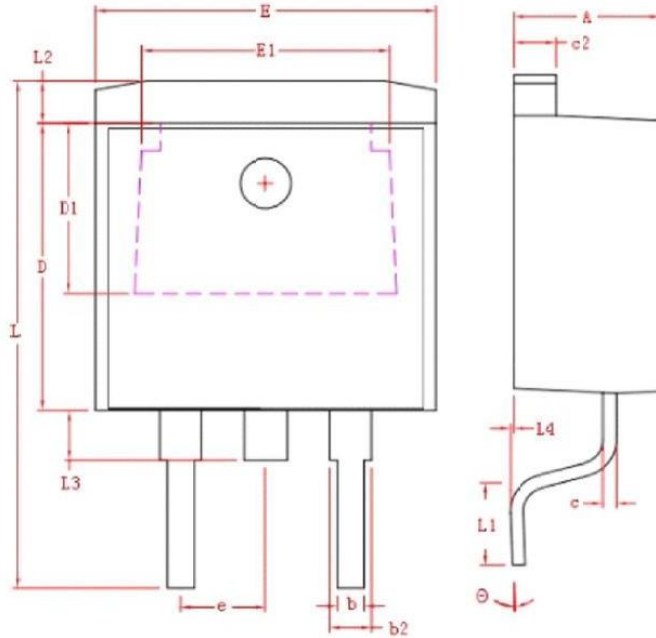


Figure 12. Gate Charge



PACKAGE INFORMATION

TO263-2L



Symbol	Dimensions In Millimeters	
	MIN.	MAX.
A	4.40	4.80
b	0.76	1.00
L4	0.00	0.25
C	0.36	0.50
L3	1.50 REF	
L1	2.29	2.79
E	9.80	10.40
E1	7.40 REF	
c2	1.25	1.45
b2	1.17	1.47
D	8.60	9.00
D1	5.10 REF	
e	2.54 REF	
L	14.6	15.8
θ	0° ± 3°	
L2	1.27 REF	