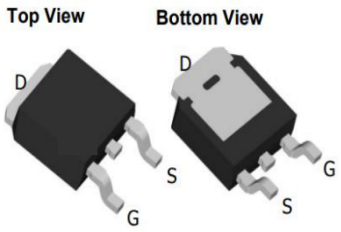
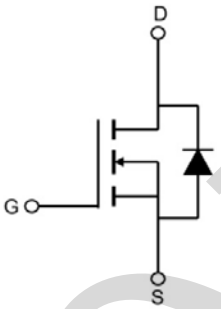
N-Channel Multilayer Epitaxial Super Junction Power MOSFET

MCR65B380D

TO-252





V_{DS}	650	V
$R_{DS(on),TYP}$@ V_{GS}=10 V	330	mΩ
I_D	11	A

Features

- New technology for high voltage device
- Low on-resistance and low conduction losses
- small package
- Ultra Low Gate Charge cause lower driving requirements
- 100% Avalanche Tested
- ROHS compliant

Application

- Power factor correction（PFC）
- Switched mode power supplies(SMPS)
- Uninterruptible Power Supply（UPS）

Maximum ratings, at T_A =25°C, unless otherwise specified

Symbol	Parameter		Rating	Unit
$V_{(BR)DSS}$	Drain-Source breakdown voltage		650	V
V_{GS}	Gate-Source voltage		±30	V
I_D	Continuous drain current @VGS=10V	T_C =25°C	11	A
		T_C =100°C	7	A
I_{DM}	Pulse drain current tested ①	T_C =25°C	33	A
E_{AS}	Avalanche energy, single pulsed②		272	mJ
P_D	Maximum power dissipation	T_C =25°C	83	W
T_{STG},T_J	Storage and Junction Temperature Range		-55 to 150	°C

Thermal Characteristics

Symbol	Parameter	Typical	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	1.5	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	62	°C/W

Electrical Characteristics

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
Static Electrical Characteristics @ T_j=25°C (unless otherwise stated)						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	650	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=650V,V_{GS}=0V	--	--	1	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±30V,V_{DS}=0V	--	--	±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250uA	2.0	--	4.0	V
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS}=10V, I_D=5.5A	--	330	380	mΩ
gfs	Forward Transconductance	V_{GS}=10V, I_D=5.5A	--	5.9	--	S
Dynamic Electrical Characteristics @ T_j = 25°C (unless otherwise stated)						
C_{iss}	Input Capacitance	V_{DS}=25V, V_{GS}=0V, f=1.0 MHz	--	730	--	pF
C_{oss}	Output Capacitance		--	690	--	pF
C_{rss}	Reverse transfer Capacitance		--	7	--	pF
Q_g (10V)	Total Gate Charge	V_{DS}=20V, I_D=11.0 A , V_{GS}=10V	--	10.5	--	nC
Q_{gs}	Gate-Source Charge		--	4.5	--	nC
Q_{gd}	Gate-Drain Charge		--	2.2	--	nC
R_G	Gate Resistance	f=1MHz	--	5.2	--	Ω

Switching Characteristics

Td(on)	Turn-on Delay Time	V_{DS}=380V, I_D=11A, V_{GS}=10V, R_G=25Ω	--	26	--	ns
Tr	Turn-on Rise Time		--	28.3	--	ns
Td(off)	Turn-Off Delay Time		--	34	--	ns
Tf	Turn-Off Fall Time		--	33.2	--	ns

Source- Drain Diode Characteristics@ T_j = 25°C (unless otherwise stated)

I_{SD}	Continuous Diode Forward Current	T_C=25°C	--	--	11	A
V_{SD}	Forward on voltage	I_{SD}=11A,V_{GS}=0V	--	1	1.3	V
Trr	Reverse Recovery Time	T_j=25°C , I_{SD}=11A di/dt=100A/μs	--	266	--	ns
Qrr	Reverse Recovery Charge		--	2.8	--	nC
Irrm	Peak Reverse Recovery Current		--	19.6	--	A

NOTE:

①Repetitive rating: pulse-width limited by maximum junction temperature.

②E_{AS} Test condition: V_{DD}=50V, R_G=25Ω, L=10.5mH, TJ=25℃

Typical Characteristics

Figure 1. Maximum Safe Operating Area

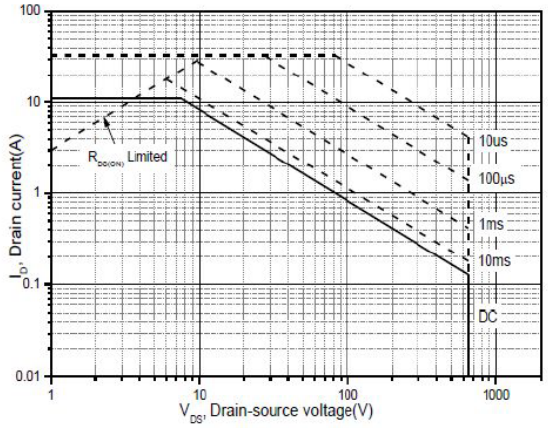


Figure 2. Typical Source-Drain Diode Forward Voltage

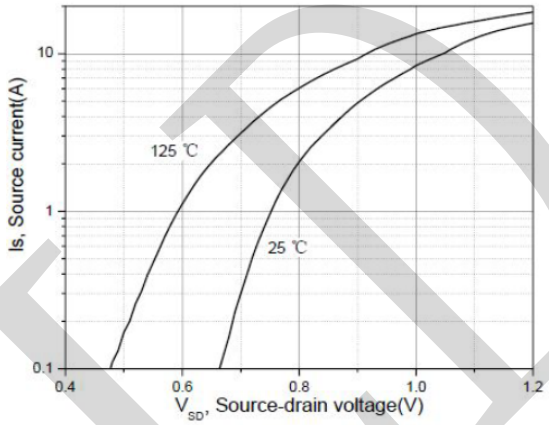


Figure 3. Typical Output Characteristics

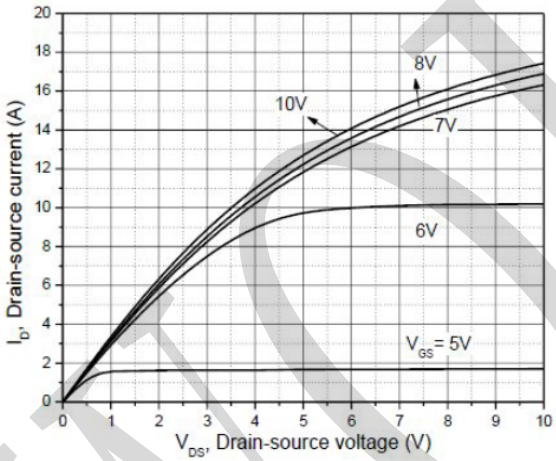


Figure 4. Transfer Characteristics

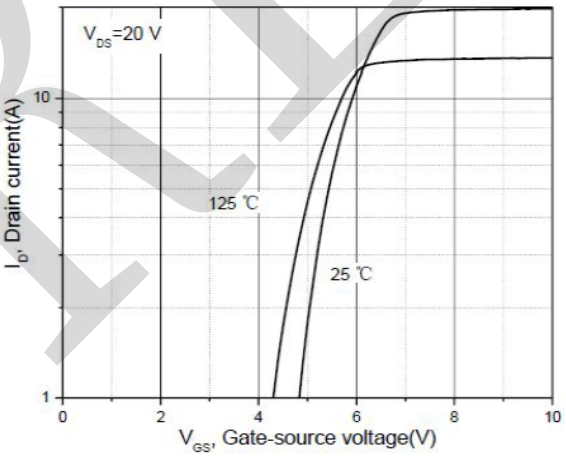


Figure 5. Static drain-source On-Resistance

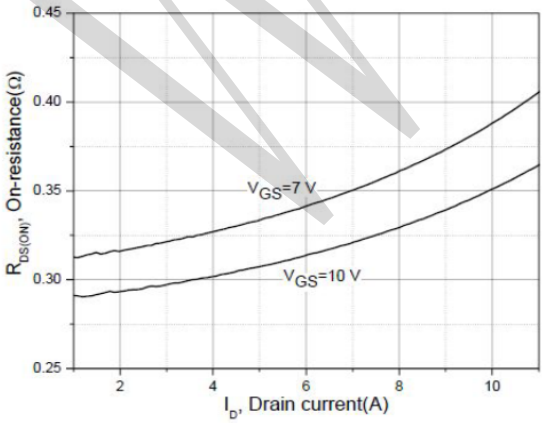
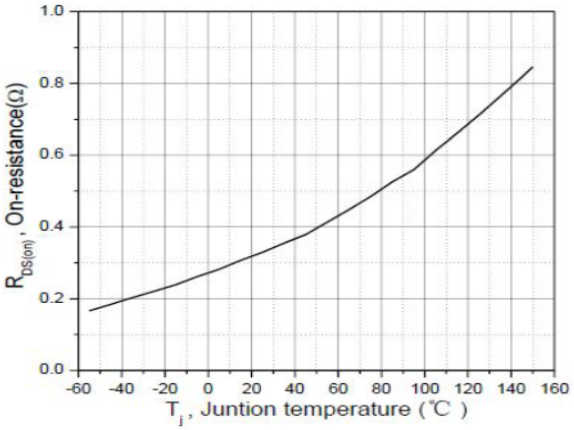


Figure 6. R_{DS}(on) VS Junction Temperature



Typical Characteristics

Figure 7. BVDSS VS Junction Temperature

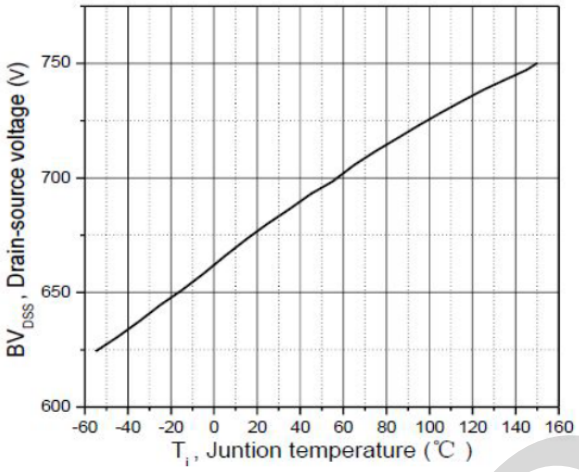


Figure 8. Maximum ID VS Junction Temperature

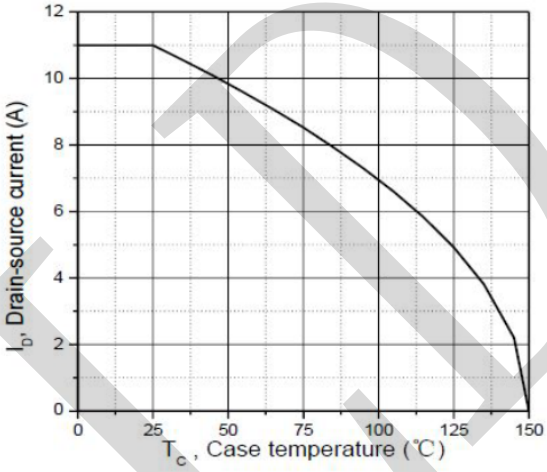


Figure 9. Gate Charge waveforms

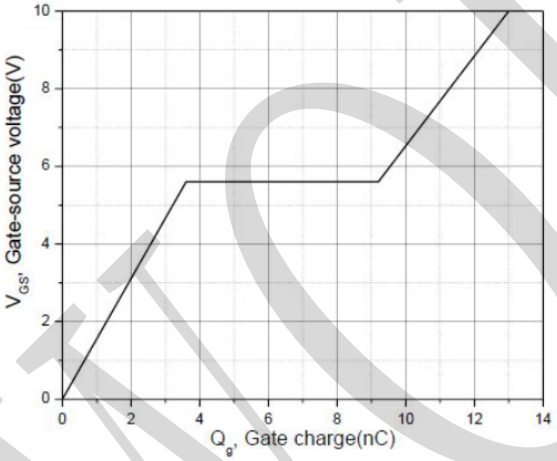
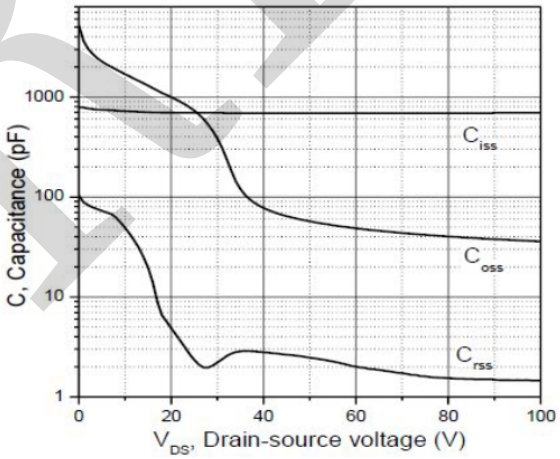


Figure 10. Capacitance



PACKAGE OUTLINE DIMENSIONS

Note:unit mm

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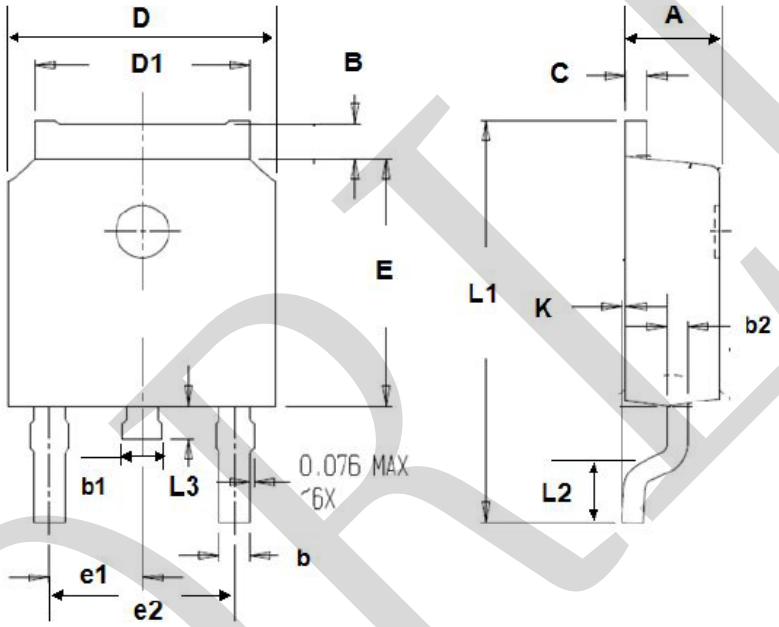

单位:毫米/UNIT：mm

符号 SYMBOL	最小值 min	最大值 max	符号 SYMBOL	最小值 min	最大值 max
A	2.10	2.50	B	0.85	1.25
b	0.50	0.80	b1	0.70	1.20
b2	0.45	0.70	C	0.45	0.70
D	6.30	6.75	D1	5.10	5.50
E	5.30	6.30	e1	2.25	2.35
L1	9.20	10.60	e2	4.45	4.75
L2	0.90	1.75	L3	0.60	1.10
K	0.00	0.23			