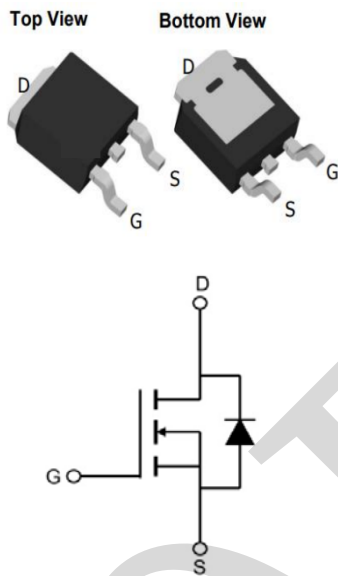


N-Channel Multilayer Epitaxial Super Junction Power MOSFET

MCR65B600D
TO-252



V_{DS}	650	V
$R_{DS(on),MAX}@ V_{GS}=10\text{ V}$	600	mΩ
I_D	7	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 $T_A = 25^\circ\text{C}$, unless otherwise specified

Symbol	Parameter		Rating	Unit
V(BR)DSS	Drain-Source breakdown voltage		650	V
VGS	Gate-Source voltage		±25	V
ID	Continuous drain current @VGS=10V	Tc=25°C	7	A
		Tc=100°C	4	A
IDM	Pulse drain current tested ①	Tc=25°C	23	A
EAS	Avalanche energy, single pulsed②		65	mJ
PD	Maximum power dissipation	Tc=25°C	63	W
TSTG,TJ	Storage and Junction Temperature Range		-55 to +150	°C

Thermal Characteristics

Symbol	Parameter	Typical	Unit
R _{θJC}	Thermal Resistance, Junction-to-Case	2.0	°C/W
R _{θJA}	Thermal Resistance, Junction-to-Ambient	62.5	°C/W

Electrical Characteristics

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
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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 =4A	--	--	600	mΩ
g _{fs}	Forward Transconductance	V _{GS} =10V, I _D =4A	--	7	--	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	--	560	--	pF
C _{oss}	Output Capacitance		--	425	--	pF
C _{rss}	Reverse transfer Capacitance		--	32	--	pF
Q _g (10V)	Total Gate Charge	V _{DS} =10V, I _D =8A , V _{GS} =10V	--	11.3	--	nC
Q _{gs}	Gate-Source Charge		--	2.8	--	nC
Q _{gd}	Gate-Drain Charge		--	2.8	--	nC
R _G	Gate Resistance	f=1MHz	--	7.5	--	Ω

Switching Characteristics

Td(on)	Turn-on Delay Time	V _{DS} =380V, I _D =8A, V _{GS} =10V, R _G =20Ω	--	18	--	ns
Tr	Turn-on Rise Time		--	18	--	ns
Td(off)	Turn-Off Delay Time		--	27	--	ns
Tf	Turn-Off Fall Time		--	22	--	ns

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

ISD	Continuous Diode Forward Current	T _C =25°C	--	--	7	A
VSD	Forward on voltage	I _{SD} =5.0A, V _{GS} =0V	--	0.7	1.3	V
Trr	Reverse Recovery Time	T _J =25°C , I _F =7A , di/dt=100A/μs	--	211	--	ns
Qrr	Reverse Recovery Charge		--	1.8	--	nC
Irrm	Peak Reverse Recovery Current		--	10.5	--	A

NOTE:

- ① Repetitive rating: pulse-width limited by maximum junction temperature.
- ② E_{AS} Test condition: V_{DD}=50V, R_G=25Ω, L=3mH, I_D=7A , T_J=25°C.

Typical Characteristics

Figure 1. Maximum Safe Operating Area

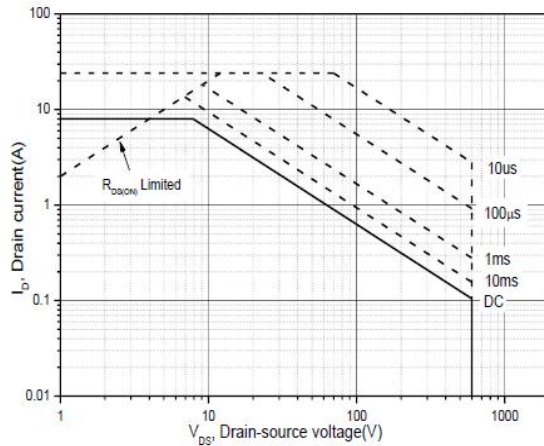


Figure 2. Transfer Characteristics

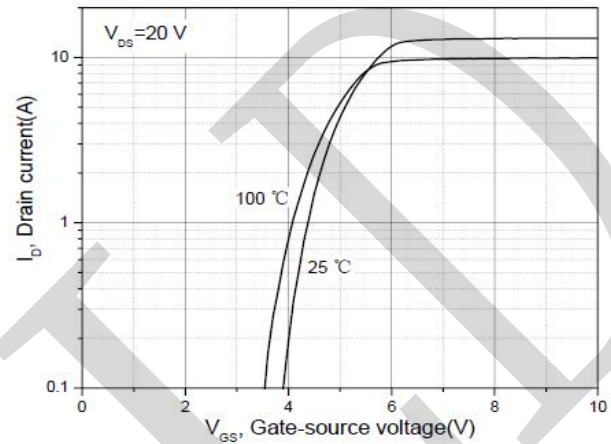


Figure 3. Typical Output Characteristics

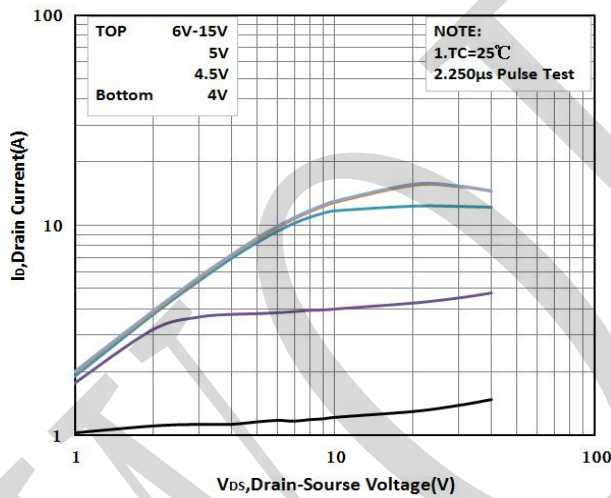


Figure 4. Transfer Characteristics

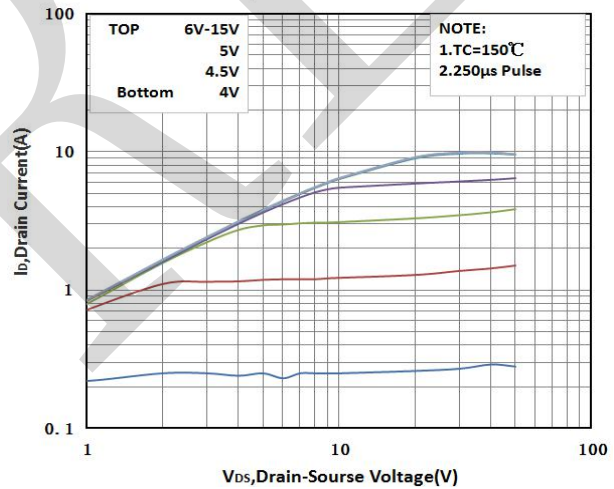


Figure 5. Static drain-source On-Resistance

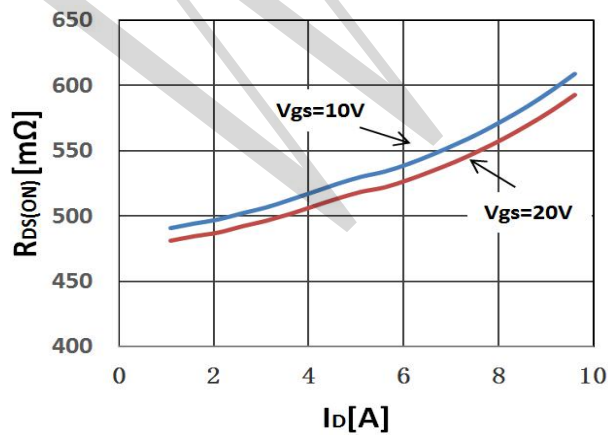
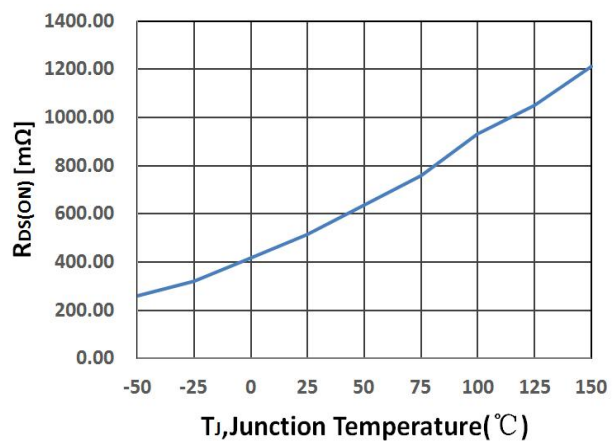


Figure 6. R_DS(on) VS Junction Temperature



Typical Characteristics

Figure 7. Gate Charge waveforms

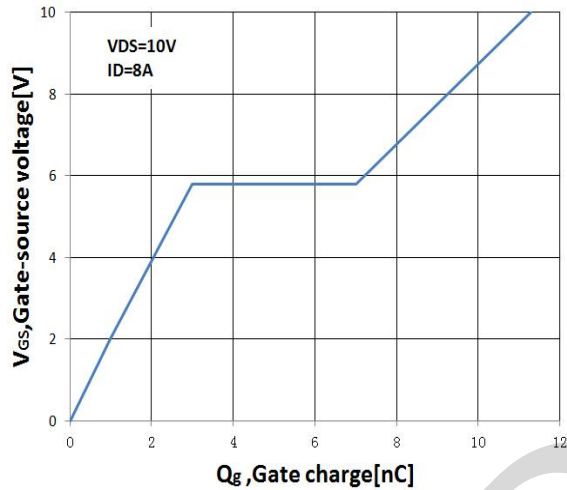


Figure 8. Capacitance

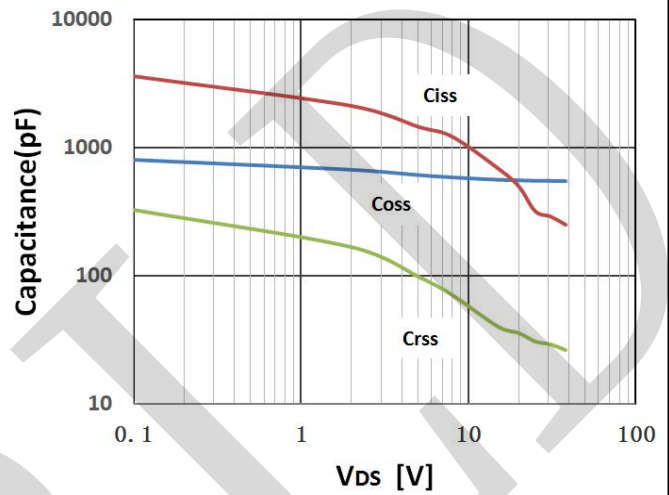
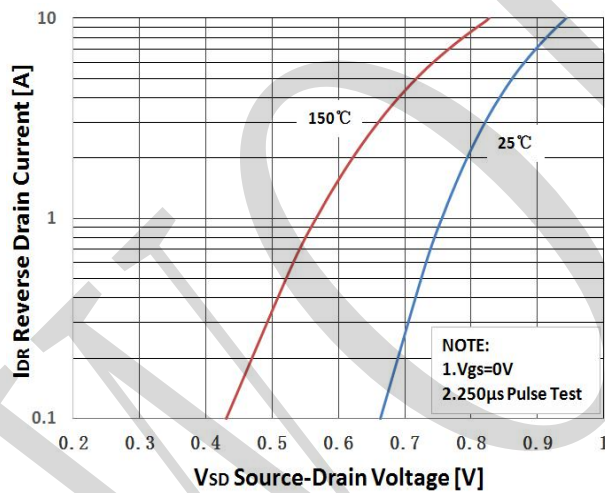


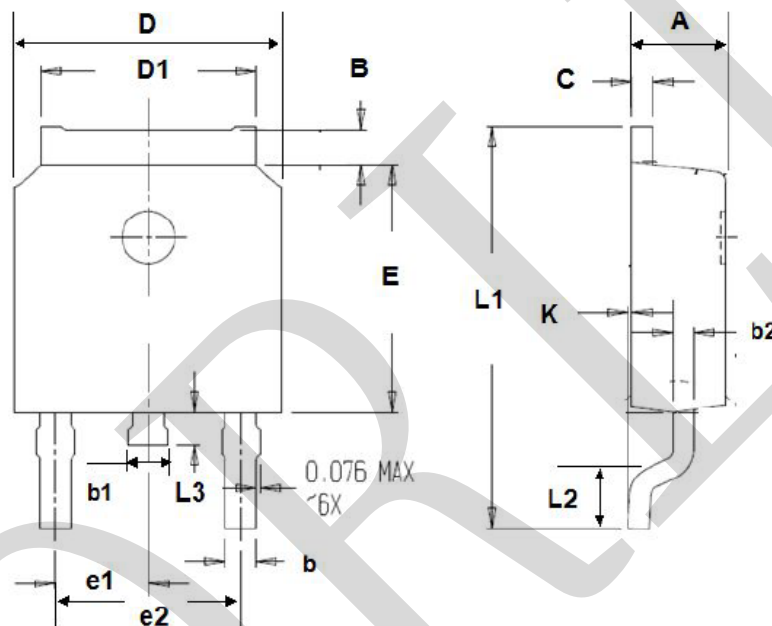
Figure 9. Typical Source-Drain Diode Forward Voltage



PACKAGE OUTLINE DIMENSIONS

Note:unit mm

TO-252



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			