MCR65B260CTB
MCR65B260CTF
MCR65B260CT

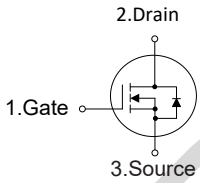
21-Nov-2023

N-Channel Multilayer Epitaxial Super Junction Power MOSFET

TO-220AB

TO-220F

TO-263



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）

Table 1. Absolute Maximum Ratings (T_C=25℃)

Parameter	Symbol	MCR65B260CTB MCR65B260CT	MCR65B260CTF	Unit
Drain-Source Voltage (V_{GS}=0V)	V_{DS}	650		V
Gate-Source Voltage (V_{DS}=0V), AC(f>1HZ)	V_{GS}	±30		V
Continuous Drain Current at T_C =25°C	$I_{D\ (DC)}$	15	15*	A
Continuous Drain Current at T_C =100°C	$I_{D\ (DC)}$	9	9*	A
Pulsed drain current **(Note 1)**	$I_{DM\ (pluse)}$	45	45*	A
Maximum Power Dissipation(T_C=25℃)	P_D	101	32.6	W
Single pulse avalanche energy **(Note2)**	E_{AS}	290		mJ
Avalanche current **(Note 1)**	I_{AR}	2.4		A
Repetitive Avalanche energy ， t_{AR} limited by T_{jmax} **(Note 1)**	E_{AR}	0.44		mJ
Drain Source voltage slope, V_{DS} ≤480 V,	dv/dt	50		V/ns
Reverse diode dv/dt， V_{DS} ≤480 V,I_{SD}<I_D	dv/dt	15		V/ns
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55~+150		°C
* limited by maximum junction temperature				

Table 2. Thermal Characteristic

Parameter	Symbol	MCR65B260CTB MCR65B260CT	MCR65B260CTF	Unit
Thermal Resistance，Junction-to-Case（Maximum）	R_{thJC}	1.24	3.83	°C /W
Thermal Resistance，Junction-to-Ambient （Maximum）	R_{thJA}	62	80	°C /W

Table 3. Electrical Characteristics (TA=25℃unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
On/off states						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=250μA	650			V
Zero Gate Voltage Drain Current(Tc=25℃)	I_{DSS}	V_{DS}=650V,V_{GS}=0V			1	μA
Zero Gate Voltage Drain Current(Tc=125℃)	I_{DSS}	V_{DS}=650V,V_{GS}=0V			100	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA	2.5		4.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=5.3A		240	260	mΩ
Dynamic Characteristics						
Input Capacitance	C_{lss}	V_{DS}=100V,V_{GS}=0V, F=1.0MHz		1139		pF
Output Capacitance	C_{oss}			40		pF
Reverse Transfer Capacitance	C_{rss}			3		pF
Total Gate Charge	Q_g	V_{DS}=520V,I_D=15A , V_{GS}=10V		27		nC
Gate-Source Charge	Q_{gs}			5.5		nC
Gate-Drain Charge	Q_{gd}			10.5		nC
Switching times						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=400V,I_D=15A , R_G=25Ω		25		nS
Turn-on Rise Time	t_r			63		nS
Turn-Off Delay Time	$t_{d(off)}$			100		nS
Turn-Off Fall Time	t_f			50		nS
Source- Drain Diode Characteristics						
Forward on voltage	V_{SD}	Tj=25°C,I_{SD}=15A,V_{GS}=0V		0.9	1.2	V
Reverse Recovery Time	t_{rr}	VR=400V,I_F=Is, di/dt=100A/μs		410		nS
Reverse Recovery Charge	Q_{rr}			4.1		uC
Peak Reverse Recovery Current	I_{rrm}			20		A

Notes: 1.Repetitive Rating: Pulse width limited by maximum junction temperature

2. Tj=25℃,VDD=50V,VG=10V, R_G=25Ω

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS (curves)

Figure 1. Output Characteristics

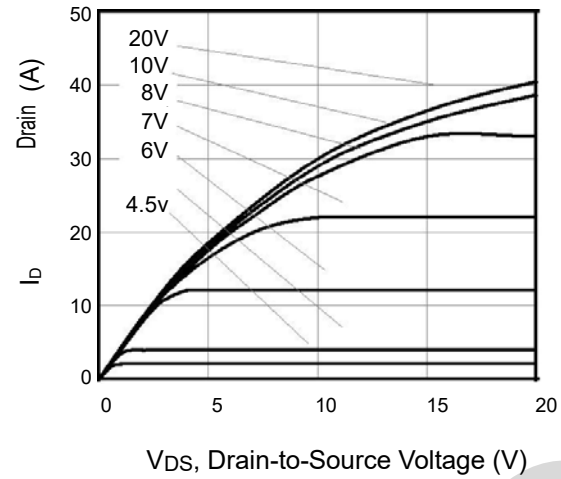


Figure 2. Transfer Characteristics

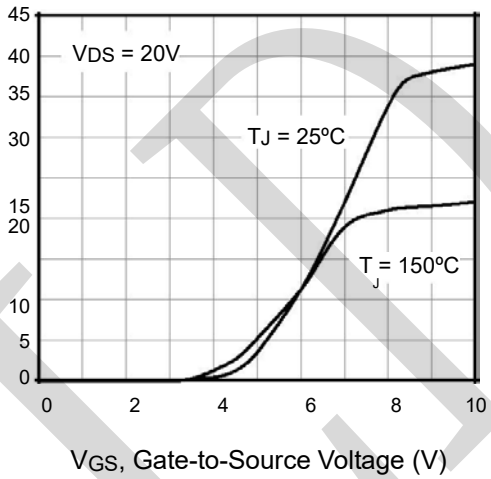


Figure 3. On-Resistance vs. Drain Current

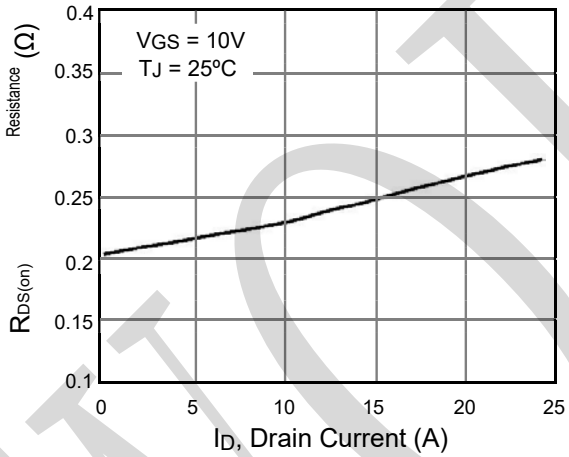


Figure 4. Capacitance

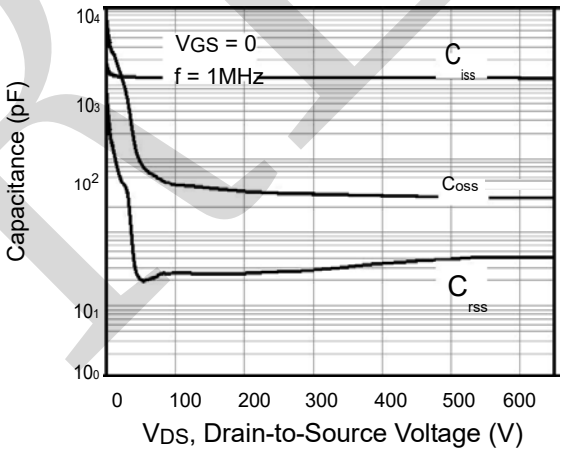


Figure 5. Gate Charge

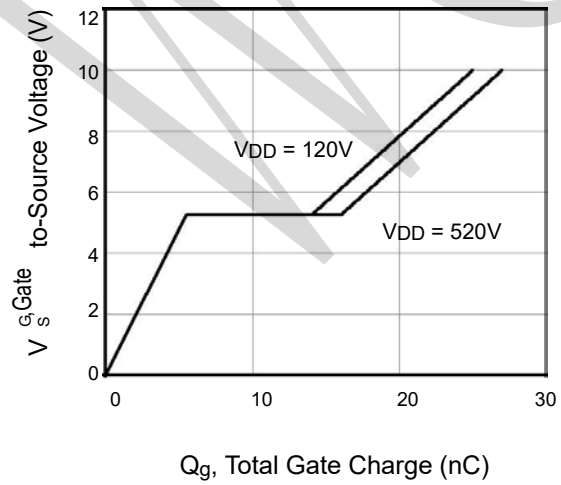
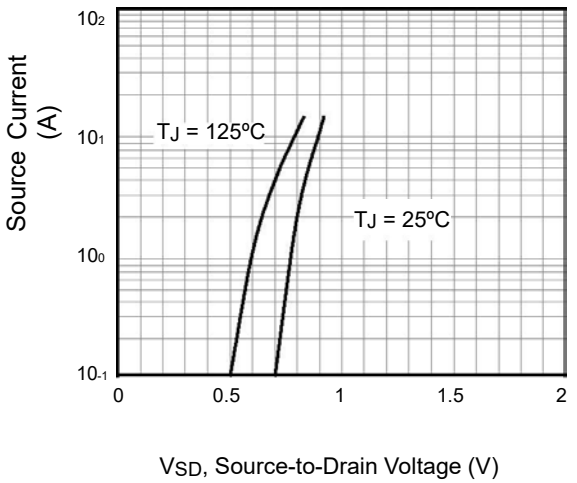


Figure 6. Body Diode Forward Voltage



TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS (curves)

Figure 7. On-Resistance vs. Junction Temperature

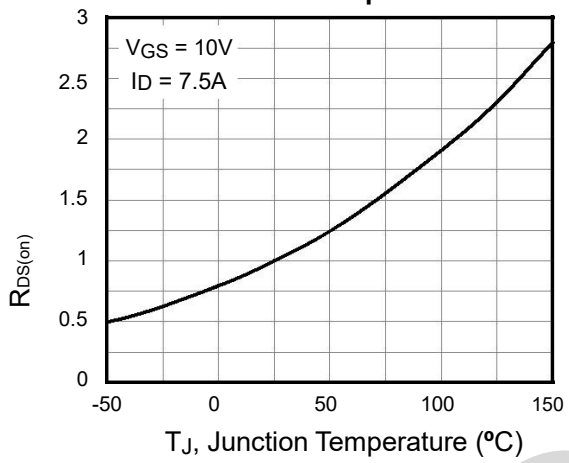


Figure 8. Breakdown voltage vs. Junction Temperature

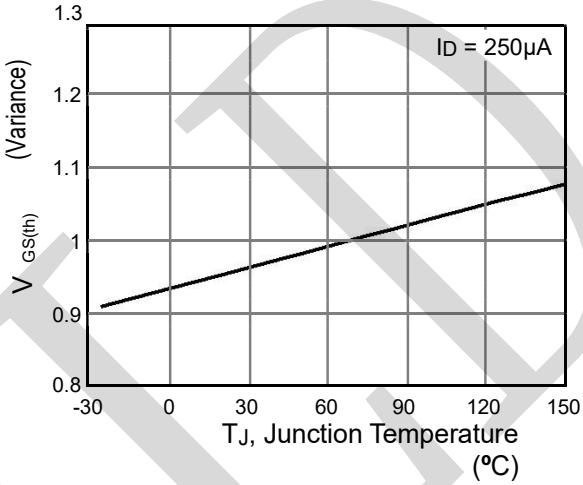


Figure 9. Transient Thermal Impedance

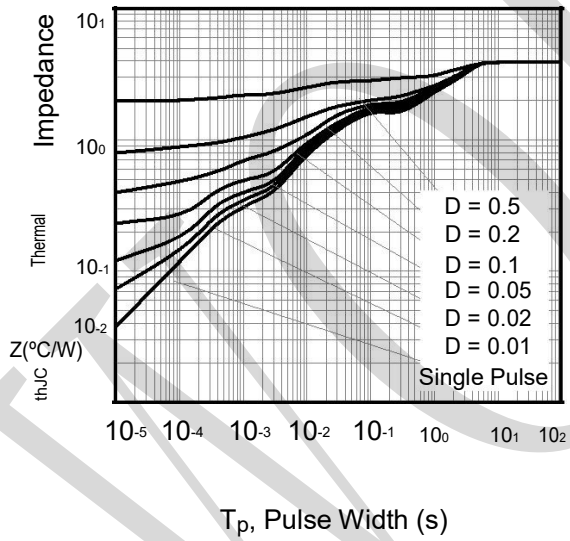
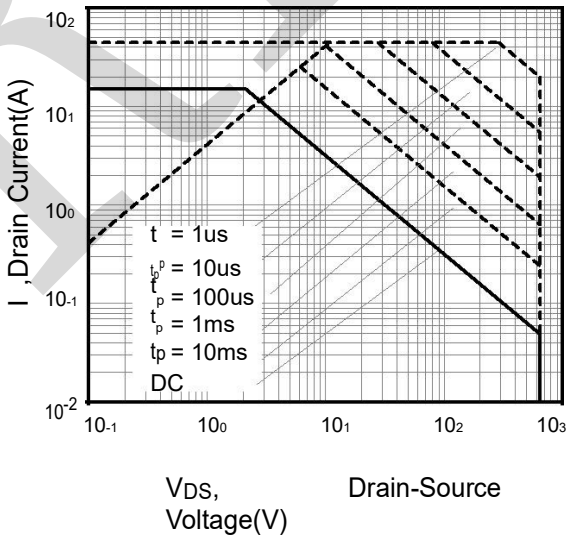
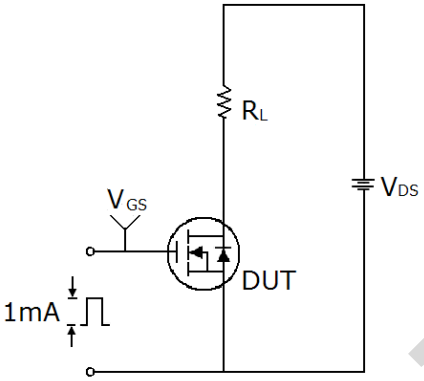


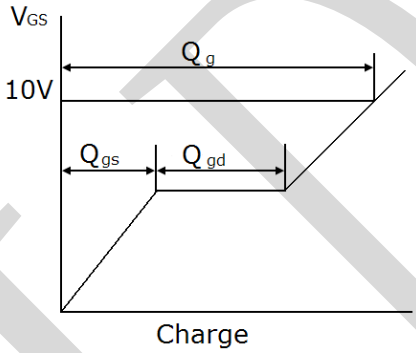
Figure 10. Safe operation area for



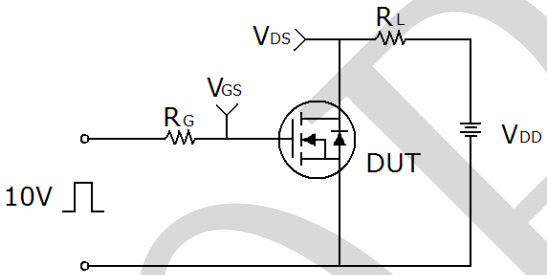
Test circuit

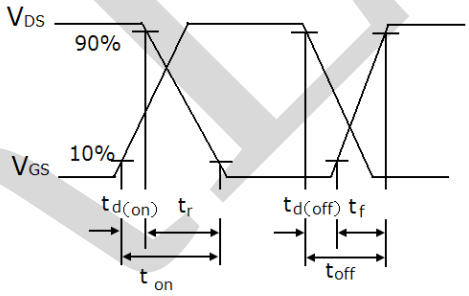
1）Gate charge test circuit & Waveform



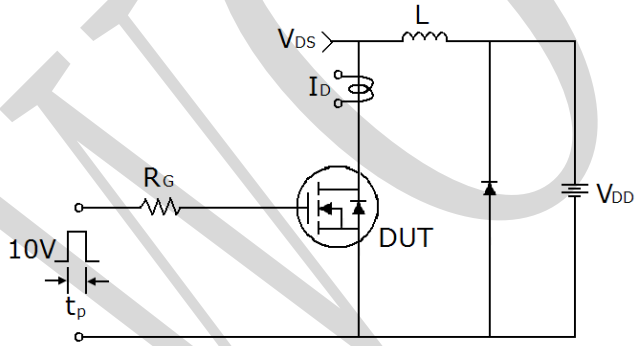


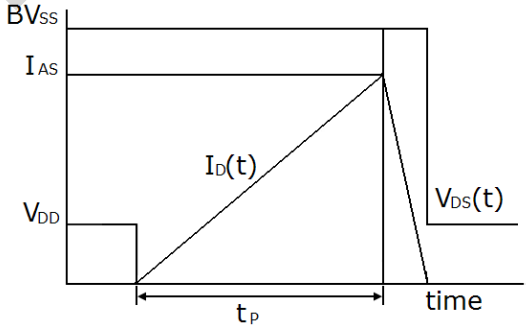
2）Switch Time Test Circuit:





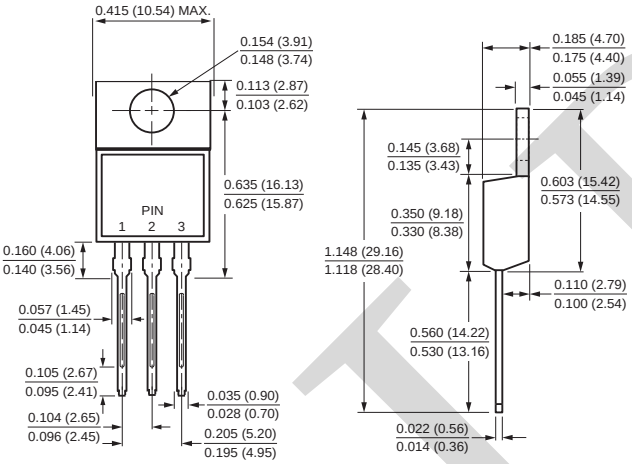
3）Unclamped Inductive Switching Test Circuit & Waveforms



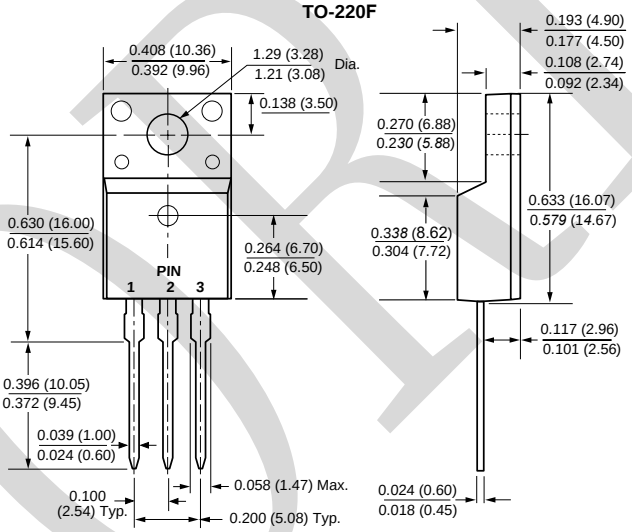


PACKAGE OUTLINE DIMENSIONS

TO-220AB



TO-220F



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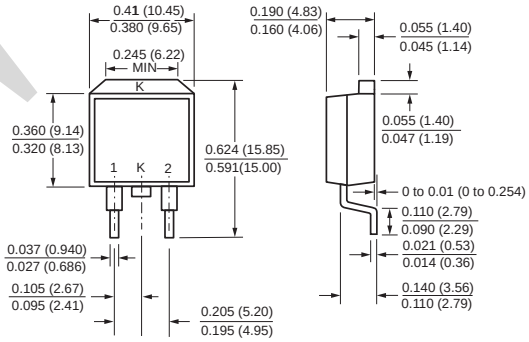
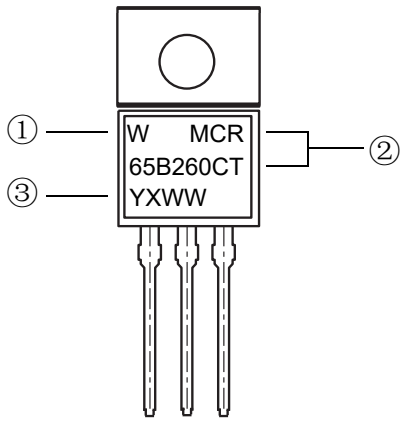
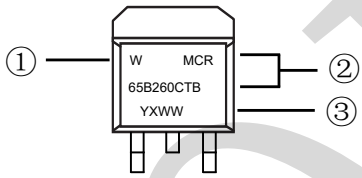


Marking Information



①W : Company's trademark
②Product model : MCR65B260CT/CTF
③PDC information：

Y X WW
- WW:Week code(01 to 53)
- X:Internal identification code
- Y:Year code(ex:0=2020)



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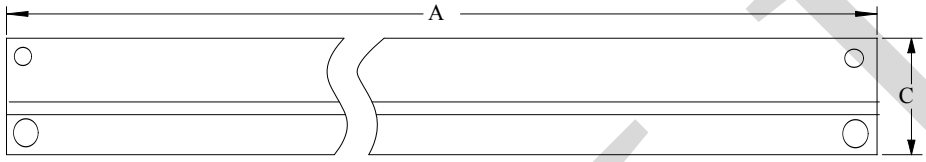
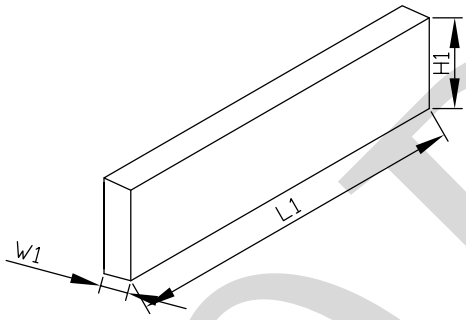
Packaging Information

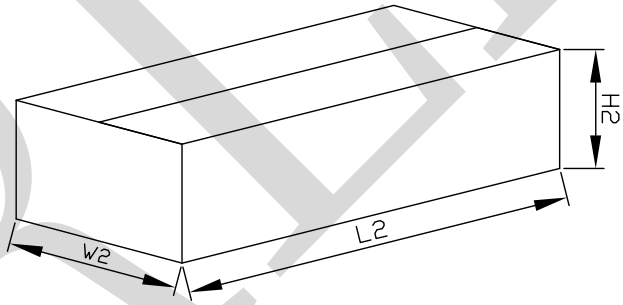
1.Tube Dimensions



2.Inside Box



3.Outside Box



Packaging Information

NO	UNIT	Tube Dimensions			Inside Box			Outside Box		
Size	mm	A	B	C	L1	W1	H1	L2	W2	H2
		530	7	32	573	50	160	590	285	185
QTY	PCS	50PCS/Tube			Smallest package,1000PCS, 20 tube in total			5,000PCS/carton,5 boxes in total		
Note	Tolerance ≤20mm,±3mm; 21-100mm,±5mm; 101-500mm,±10mm									