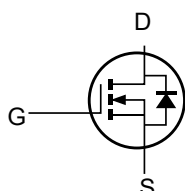
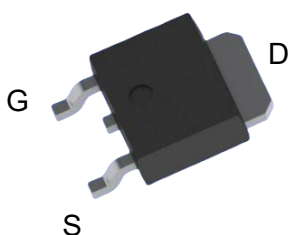


N-Channel Super Junction MOSFET

TO-252

MCR65T540D



Features

- Low $R_{DS(on)}$
- Improved dv/dt Capability
- 100% Avalanche Tested
- RoHS compliant

Application

- Switching Mode Power Supplies (SMPS)
- PWM Motor Controls
- LED Lighting
- Adapter

Table 1. Absolute Maximum Ratings ($T_C=25^\circ\text{C}$)

Parameter	Symbol	MCR65T540D	Unit
Drain-Source Voltage	V_{DS}	650	V
Gate-Source Voltage	V_{GS}	± 30	V
Continuous Drain Current at $T_C = 25^\circ\text{C}$	I_D	8*	A
Continuous Drain Current at $T_C = 100^\circ\text{C}$	I_D	5*	A
Pulsed drain current (Note 1)	I_{DM}	24*	A
Power Dissipation($T_C=25^\circ\text{C}$)	P_D	125	W
Single pulse avalanche energy (Note3)	E_{AS}	120	mJ
Repetitive Avalanche Energy(Note2)	E_{AR}	10	mJ
MOSFET dv/dt ruggedness, $V_{DS}=0\ldots 480\text{V}$	dv/dt	50	V/ns
Reverse diode dv/dt, $V_{DS}=0\ldots 480\text{V}$, $I_{SD}\leq I_D$	dv/dt	15	V/ns
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55~+150	$^\circ\text{C}$
* limited by maximum junction temperature			

Note: 1.Drain current is limited by maximum junction temperature.

2.Repetitive Rating: Pulse width limited by maximum junction temperature

3.L=60mH, $I_{AS}=2\text{A}$ $V_{DD}=50\text{V}$, $R_G=25\Omega$, Starting $T_J=25^\circ\text{C}$

Table 2. Thermal Characteristic

Parameter	Symbol	MCR65T540D	Unit
Thermal Resistance, Junction-to-Case (Maximum)	R_{thJC}	1	$^{\circ}\text{C}/\text{W}$

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

Parameter	Symbol	Condition	Min	Typ	Max	Unit
On/off states						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V\ I_D=250\mu A$	650	--	--	V
Zero Gate Voltage Drain Current($T_c=25^{\circ}C$)	I_{DSS}	$V_{DS}=650V, V_{GS}=0V$	--	--	1	μA
Zero Gate Voltage Drain Current($T_c=125^{\circ}C$)	I_{DSS}	$V_{DS}=520V, V_{GS}=0V$	--	--	50	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 30V, V_{DS}=0V$	--	--	± 100	nA
Gate Threshold Voltage	$V_{GS\ (th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.5	--	4.5	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=4A$	--	450	520	m Ω
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DS}=200V, V_{GS}=0V,$ $F=1.0MHz$	--	513	--	pF
Output Capacitance	C_{oss}		--	26	--	pF
Reverse Transfer Capacitance	C_{rss}		--	1.5	--	pF
Total Gate Charge	Q_g	$V_{DS}=520V, I_D=8A,$ $V_{GS}=10V$	--	16	--	nC
Gate-Source Charge	Q_{gs}		--	5	--	nC
Gate-Drain Charge	Q_{gd}		--	6	--	nC
Switching times						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=325V, I_D=8A,$ $V_{GS}=10V, R_G=10\Omega$	--	13	--	nS
Turn-on Rise Time	t_r		--	25	--	nS
Turn-Off Delay Time	$t_{d(off)}$		--	28	--	nS
Turn-Off Fall Time	t_f		--	24	--	nS
Source- Drain Diode Characteristics						
Forward on voltage	V_{SD}	$I_S=8A, V_{GS}=0V$	--	--	1.4	V
Reverse Recovery Time	t_{rr}	$V_{GS}=0V, I_S=8A,$ $di_F/dt=100A/\mu s$	--	237	--	nS
Reverse Recovery Charge	Q_{rr}		--	2.1	--	μC
Peak reverse recovery current	I_{rrm}		--	16.6	--	A

Typical Characteristics)

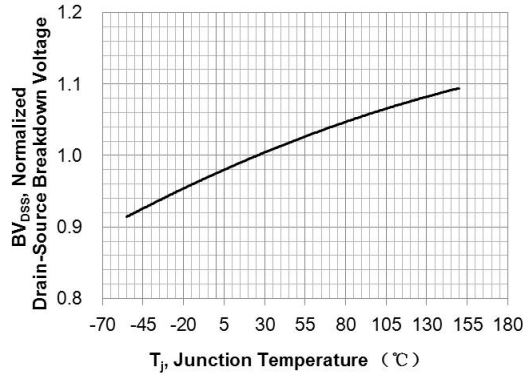


Fig1. BV_{DSS} vs Junction Temperature

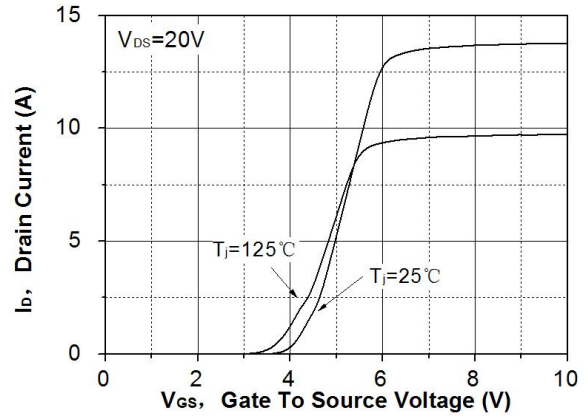


Fig 2. Transfer characteristics

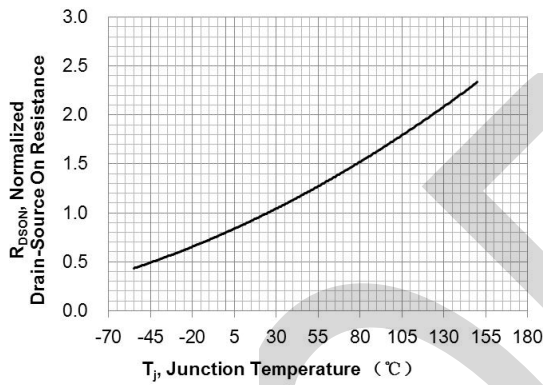


Fig 3. $R_{DS(ON)}$ vs Junction Temperature

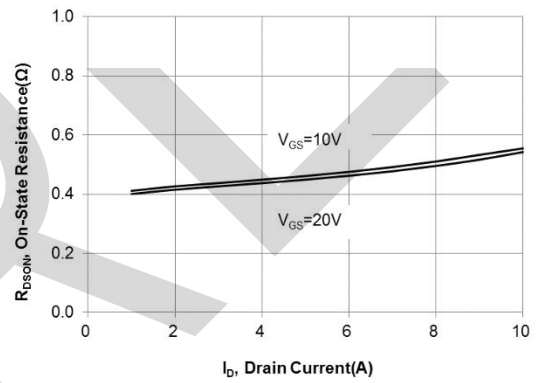


Fig 4. Drain-source on-state resistance

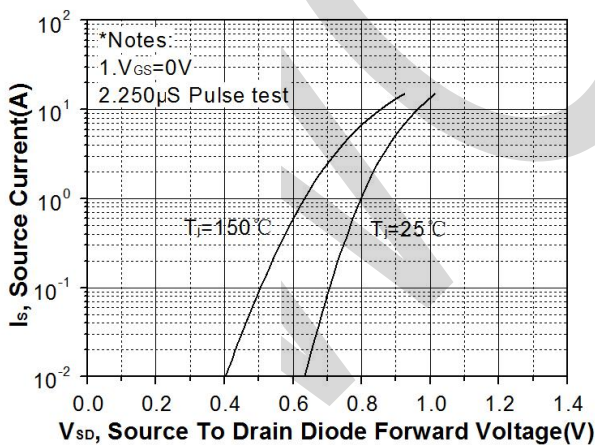


Fig 5 . Forward characteristics of reverse diode

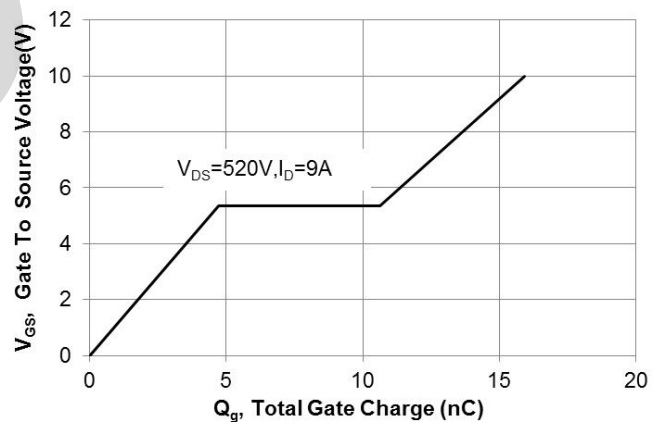


Fig 6. Gate charge characteristics

Typical Characteristics

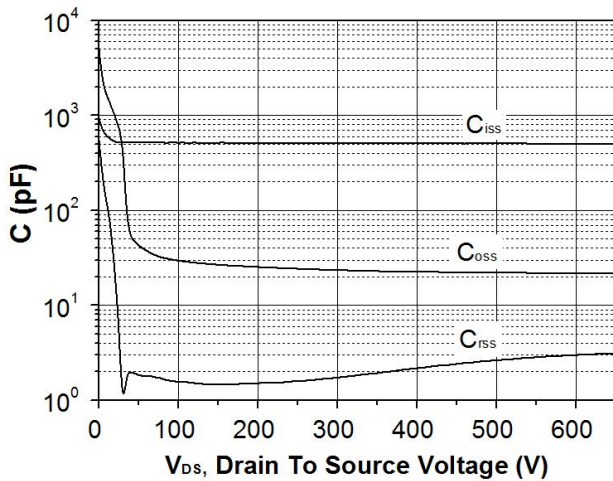


Fig 7. Capacitance Characteristics

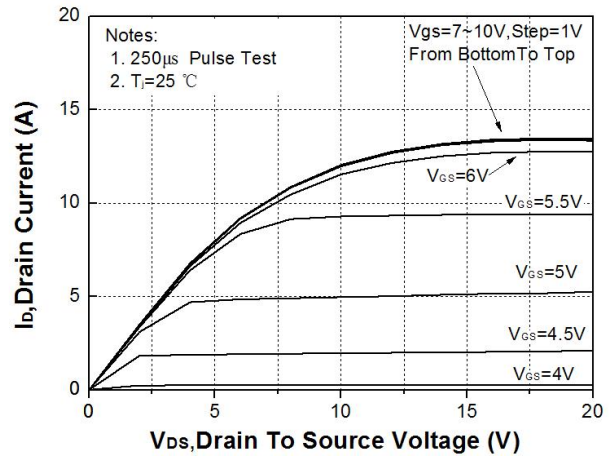


Fig 8. Output characteristics ($T_J=25\text{ }^{\circ}\text{C}$)

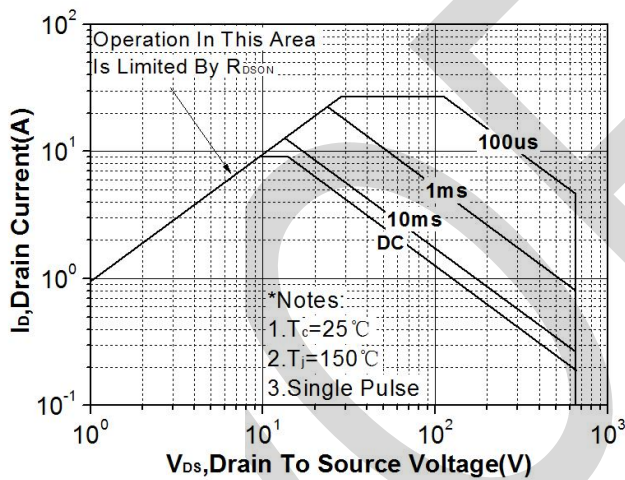


Fig 9. Safe operating area(T0252)

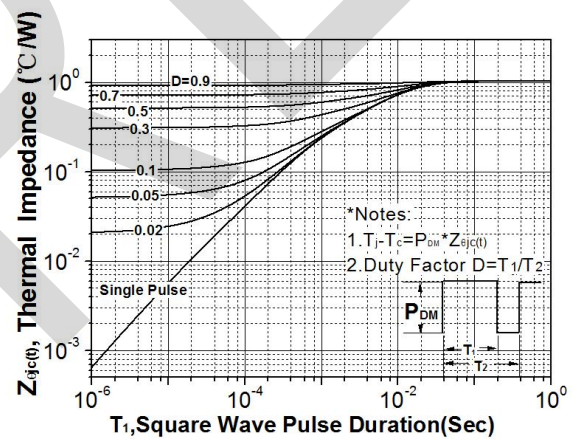
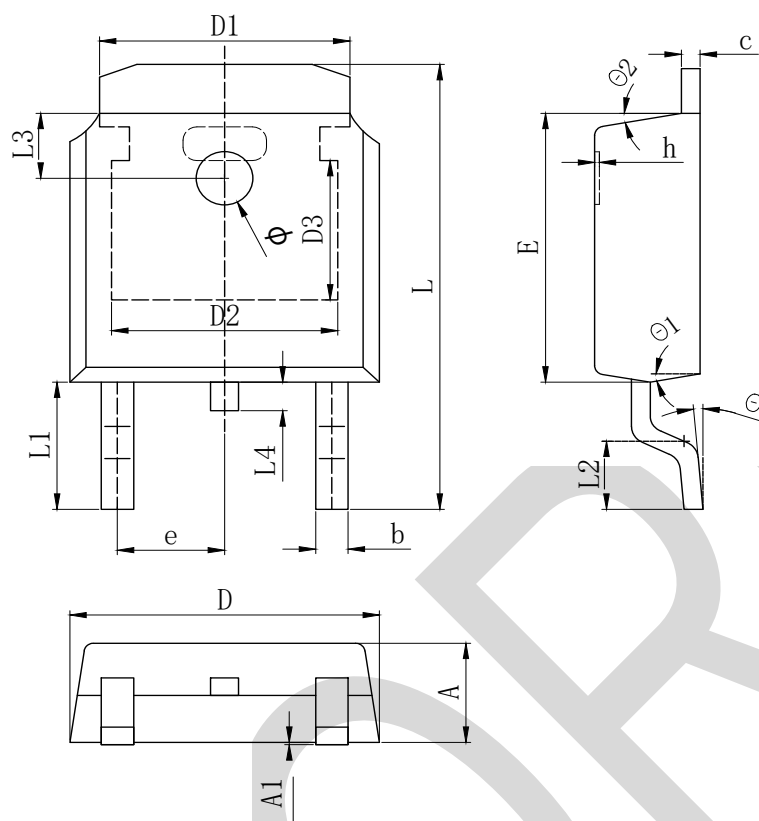


Fig 10. Transient thermal impedance (T0252)

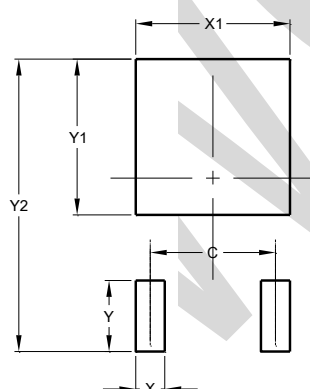
PACKAGE OUTLINE DIMENSIONS

TO-252 Package Information



SYMBOL	MILLIMETER		
	MIN	Typ.	MAX
A	2.200	2.300	2.400
A1	0.000		0.127
b	0.640	0.690	0.740
c	0.460	0.520	0.580
D	6.500	6.600	6.700
D1	5.334 REF		
D2	4.826 REF		
D3	3.166 REF		
E	6.000	6.100	6.200
e	2.286 TYP		
h	0.000	0.100	0.200
L	9.900	10.100	10.300
L1	2.888 REF		
L2	1.400	1.550	1.700
L3	1.600 REF		
L4	0.600	0.800	1.000
Φ	1.100	1.200	1.300
θ	0°		8°
θ 1	9° TYP		
θ 2	9° TYP		

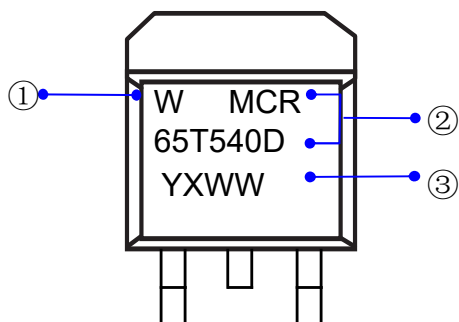
Suggested Pad Layout



TO252 (DPAK)

Dimensions	Value (in mm)
C	4.572
X	1.060
X1	5.632
Y	2.600
Y1	5.700
Y2	10.700

Marking Information



①W : Company's trademark

②Product model : MCR65T540D

③PDC information :

Y X WW

WW:Week code(01 to 53)

X:Internal identification code

Y:Year code(ex:0=2020)