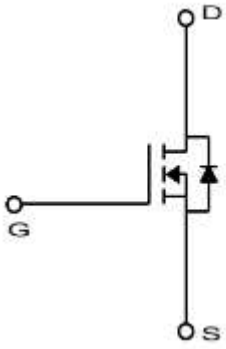
General Descriptions

The ECMDD1902 uses MOSFET Technology, which provides high performance in on-state resistance, fast switching performance and excellent quality. ECMDD1902 is suitable device for DC/DC Converters and general purpose applications.

Features

- V_{DS} = 100V
- I_D = 40A @V_{GS} = 10V
- $R_{DS(ON)}$
  < 28mΩ @VGS = 10V
  < 31mΩ @VGS = 6.0V



Absolute Maximum Ratings (T_C = 25 °C)

Characteristics		Symbol	Rating	Unit
Drain-Source Voltage		V_{DSS}	100	V
Gate-Source Voltage		V_{GSS}	±20	V
Continuous Drain Current (1)	T_C=25°C	I_D	40	A
	T_C=100°C		25	A
Pulsed Drain Current		I_{DM}	80	A
Power Dissipation	T_C=25°C	P_D	83	W
	T_C=100°C		33	
Single Pulse Avalanche Energy (2)		E_{AS}	200	mJ
Junction and Storage Temperature Range		T_J, T_{stg}	-55~150	°C

Thermal Characteristics

Characteristics	Symbol	Rating	Unit
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	50	°C/W
Thermal Resistance, Junction-to-Case (1)	$R_{\theta JC}$	1.5	

Ordering Information

Part Number	Temp. Range	Package	Packing	Rohs Status
ECMDD1902	-55~150°C	DPAK	Tape & Reel	Halogen Free

Electrical Characteristics (T_C=25°C)

Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	I_D = 250μA, V_{GS} = 0V	100	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	2.0	3.0	4.0	
Drain Cut-Off Current	I_{DSS}	V_{DS} = 80V, V_{GS} = 0V	-	-	1	μA
Gate Leakage Current	I_{GSS}	V_{GS} = ±20V, V_{DS} = 0V	-	-	±0.1	
Drain-Source ON Resistance	$R_{DS(ON)}$	V_{GS} = 10V, I_D = 20A	-	21	28	mΩ
		T_J=125°C	-	32	40	
		V_{GS} = 6.0V, I_D = 20A	-	23.5	31	
Forward Transconductance	g_{fs}	V_{DS} = 5V, I_D = 20A	-	55	-	S
Dynamic Characteristics						
Total Gate Charge	Q_g	V_{DS} = 50V, I_D = 20A, V_{GS} = 10V	-	39.8	48	nC
Gate-Source Charge	Q_{gs}		-	11	-	
Gate-Drain Charge	Q_{gd}		-	11.2	-	
Input Capacitance	C_{iss}	V_{DS} = 25V, V_{GS} = 0V, f = 1.0MHz	-	2087	2505	pF
Reverse Transfer Capacitance	C_{rss}		-	82	-	
Output Capacitance	C_{oss}		-	230	-	
Gate Resistance	R_g	V_{GS}=0V,V_{DS}=0V,F=1MHz	-	2.1	2.5	Ω
Turn-On Delay Time	$t_{d(on)}$	V_{DS}=50V, V_{GS}=10V, R_L=3.2Ω, R_{GEN}=3.2Ω	-	10.5		ns
Rise Time	t_r		-	27.5		
Turn-Off Delay Time	$t_{d(off)}$		-	38.5		
Fall Time	t_f		-	14		
Drain-Source Body Diode Characteristics						
Source-Drain Diode Forward Voltage	V_{SD}	I_S = 1A, V_{GS} = 0V	-	0.7	1.2	V
Body Diode Reverse Recovery Time	t_{rr}	I_F = 20A, dI/dt = 100A/μs	-	63	76	ns
Body Diode Reverse Recovery Charge	Q_{rr}		-	145	-	nC

Note :

1. Surface mounted RF4 board with 2oz. Copper.
2. Starting T_J=25°C, L=1mH, I_{AS}=20A, V_{DD}=50V, V_{GS}=10V

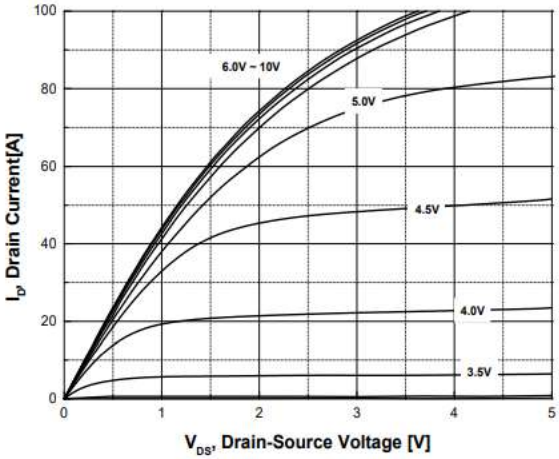


Fig.1 On-Region Characteristics

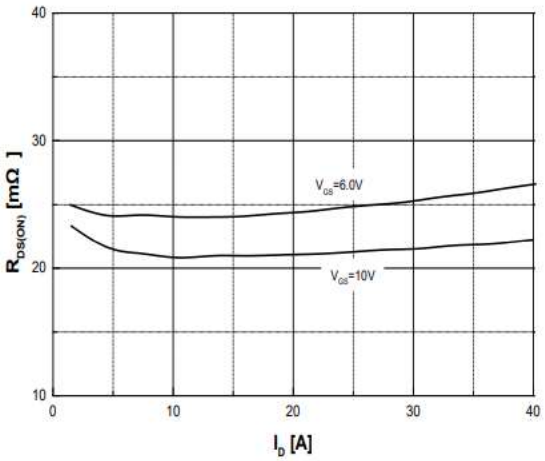


Fig.2 On-Resistance Variation with Drain Current and Gate Voltage

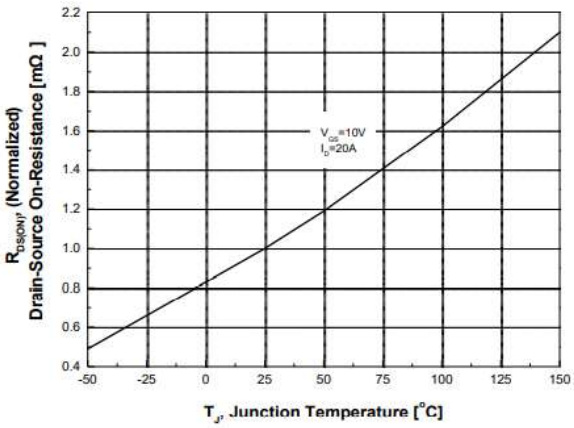


Fig.3 On-Resistance Variation with Temperature

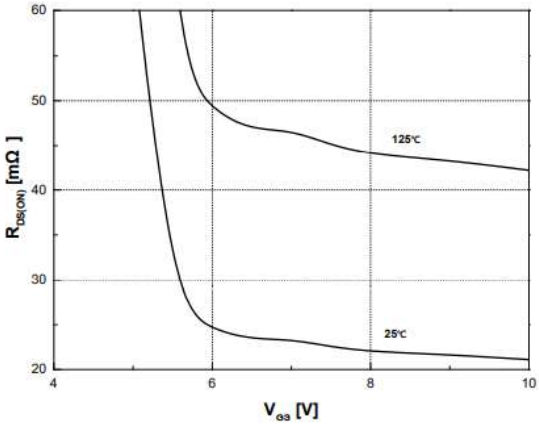


Fig.4 On-Resistance Variation with Gate to Source Voltage

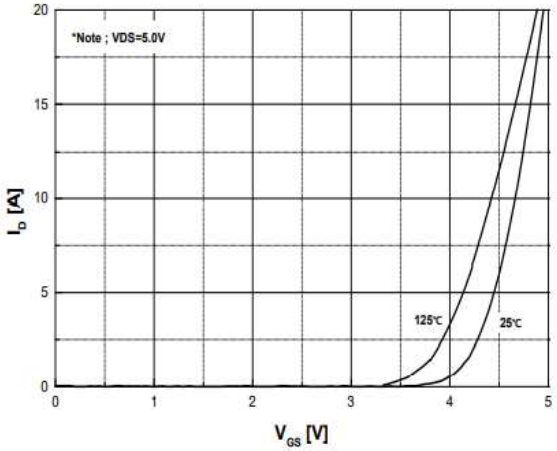


Fig.5 Transfer Characteristics

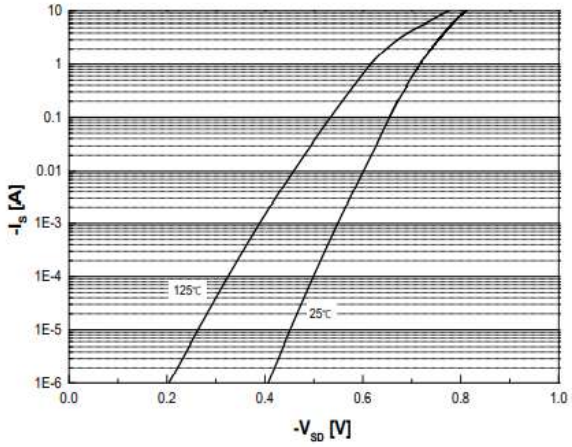


Fig.6 Body Diode Forward Voltage Variation with Source Current and Temperature

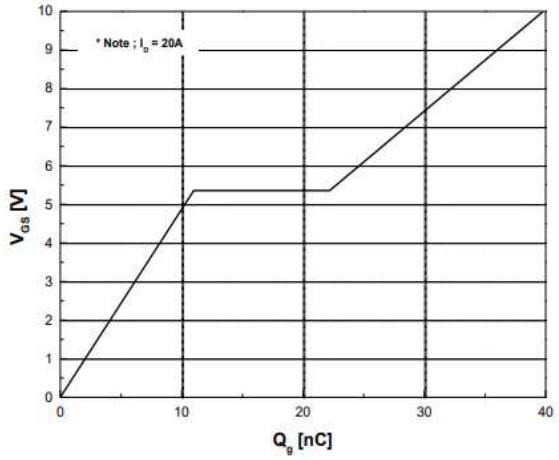


Fig.7 Gate Charge Characteristics

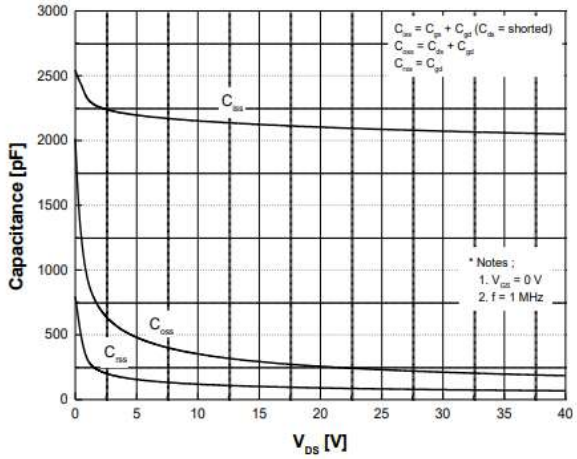


Fig.8 Capacitance Characteristics

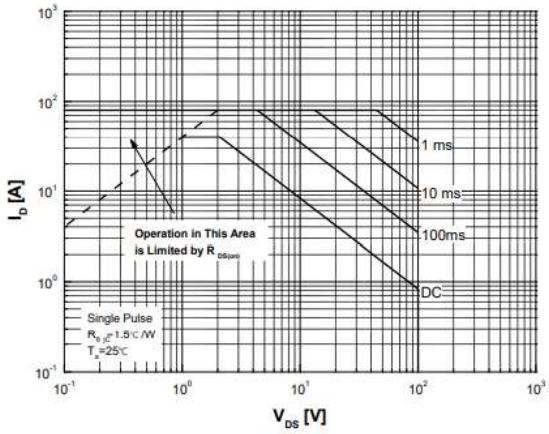


Fig.9 Maximum Safe Operating Area

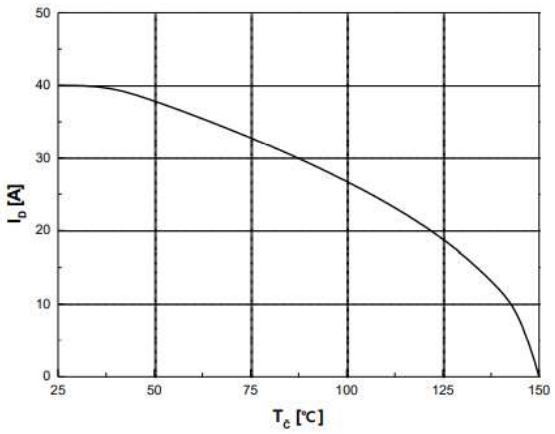


Fig.10 Maximum Drain Current vs. Case Temperature

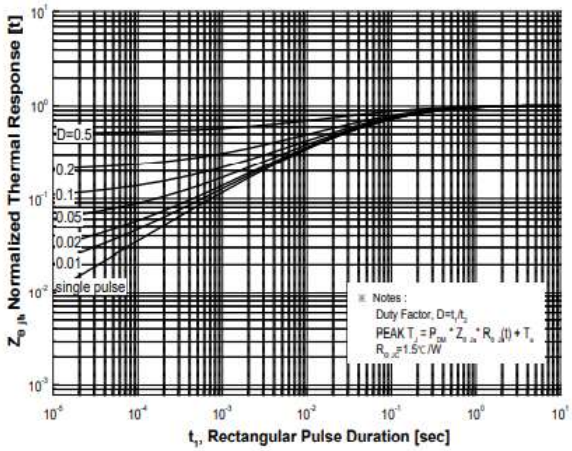
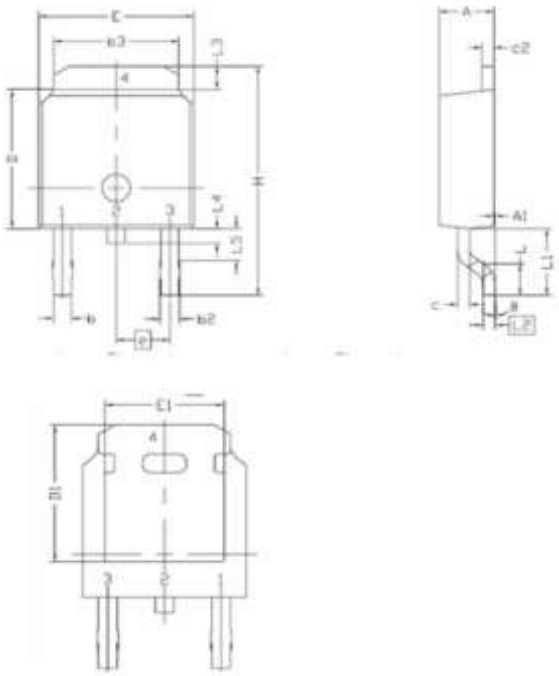


Fig.11 Transient Thermal Response Curve

Package Dimension

TO-252 (DPAK)

Dimensions are in millimeters, unless otherwise specified



Symbol	Min.	Nom.	Max.
E	6.35	–	6.73
L	1.40	1.52	1.78
L1		2.74 REF	
L2		0.508 BCS	
L3	0.89	–	1.27
L4	–	–	1.02
L5	1.14	–	1.52
D	5.97	6.10	6.22
H	9.40	–	10.41
b	0.64	–	0.89
b2	0.76	–	1.14
b3	4.95	–	5.46
e		2.286 BSC	
A	2.18	–	2.39
A1	–	–	0.13
c	0.46	–	0.61
c2	0.46	–	0.89
D1	5.21	–	–
E1	4.32	–	–
⊖	0.00	–	10.00

Note : Package body size, length and width do not include mold flash, protrusions and gate burrs.