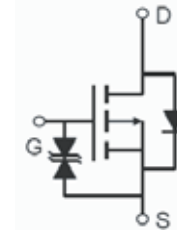


P-Channel Enhancement Mode Power MOSFET

Description

The RM35P100T2 uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications. It is ESD protected.



Schematic diagram

General Features

- $V_{DS} = -100V, I_D = -35A$
 $R_{DS(ON)} < 50m \Omega @ V_{GS} = -10V$
 $R_{DS(ON)} < 55m \Omega @ V_{GS} = -4.5V$
- Super high dense cell design
- Advanced trench process technology
- Reliable and rugged
- High density cell design for ultra low on-resistance

Application

- Power switch
- DC/DC converters
- Halogen-free



TO-220-3L top view

100% UIS TESTED!

100% ΔV_{ds} TESTED!

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
35P100	RM35P100T2	TO-220-3L	-	-	-

Absolute Maximum Ratings ($T_C = 25^\circ C$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	-100	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous	I_D	-35	A
Drain Current-Continuous ($T_C = 100^\circ C$)	$I_D(100^\circ C)$	-23	A
Pulsed Drain Current	I_{DM}	-100	A
Maximum Power Dissipation	P_D	104	W
Single pulse avalanche energy ^(Note 5)	E_{AS}	345	mJ
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	$^\circ C$

Thermal Characteristic

Thermal Resistance, Junction-to-Case ^(Note 2)	$R_{\theta Jc}$	1.2	$^{\circ}C/W$
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Electrical Characteristics ($T_c=25^{\circ}C$ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=-250\mu A$	-100	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-100V, V_{GS}=0V$	-	-	-50	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	μA
On Characteristics ^(Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1.2	-1.8	-2.5	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-10A$	-	42	50	m Ω
		$V_{GS}=-4.5V, I_D=-8A$	-	46	55	
Forward Transconductance	g_{FS}	$V_{DS}=-10V, I_D=-10A$	-	32	-	S
Dynamic Characteristics ^(Note 4)						
Input Capacitance	C_{iss}	$V_{DS}=-25V, V_{GS}=0V,$ $F=1.0MHz$	-	6516	-	PF
Output Capacitance	C_{oss}		-	233	-	PF
Reverse Transfer Capacitance	C_{rss}		-	125	-	PF
Switching Characteristics ^(Note 4)						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=-50V, I_D=-10A$ $V_{GS}=-14V, R_{GEN}=3.3\Omega$	-	20.5	-	nS
Turn-on Rise Time	t_r		-	32.2	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	123	-	nS
Turn-Off Fall Time	t_f		-	63.7	-	nS
Total Gate Charge	Q_g	$V_{DS}=-50V, I_D=-10A,$ $V_{GS}=-10V$	-	92	-	nC
Gate-Source Charge	Q_{gs}		-	17.5	-	nC
Gate-Drain Charge	Q_{gd}		-	14	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage ^(Note 3)	V_{SD}	$V_{GS}=0V, I_S=-1A$	-	-	-1.2	V
Diode Forward Current ^(Note 2)	I_S	-	-	-	-35	A
Reverse Recovery Time	t_{rr}	$T_J = 25^{\circ}C, I_F = -14A$ $di/dt = 100A/\mu s$ ^(Note 3)	-	31.2	-	nS
Reverse Recovery Charge	Q_{rr}		-	31.97	-	nC
Forward Turn-On Time	t_{on}	Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD)				

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, $t \leq 10$ sec.
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production
5. E_{AS} condition: $T_J=25^{\circ}C, V_{DD}=-50V, V_G=-10V, L=0.5mH, R_g=25\Omega$

RATING AND CHARACTERISTICS CURVES (RM35P100T2)

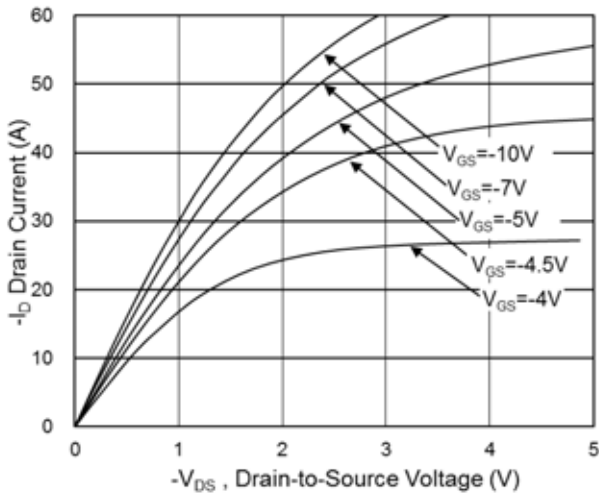


Fig.1 Typical Output Characteristics

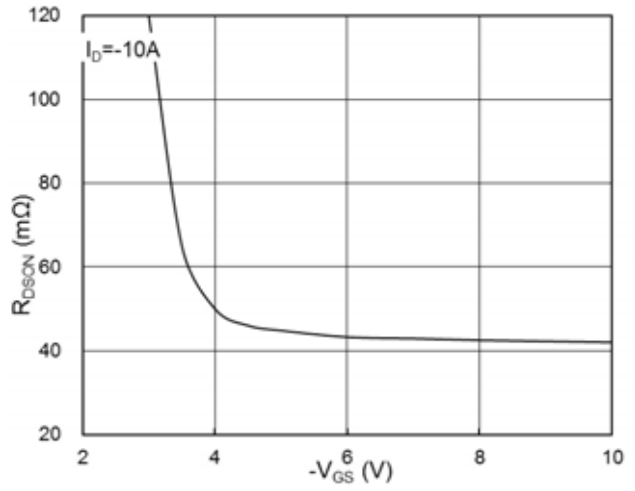


Fig.2 On-Resistance vs. G-S Voltage

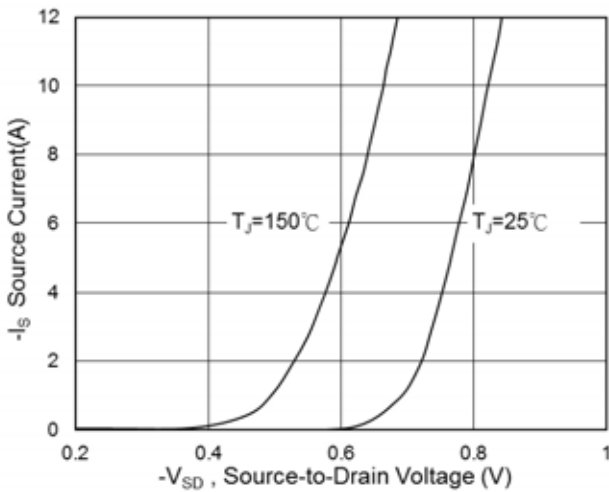


Fig.3 Typical S-D Diode Forward Voltage

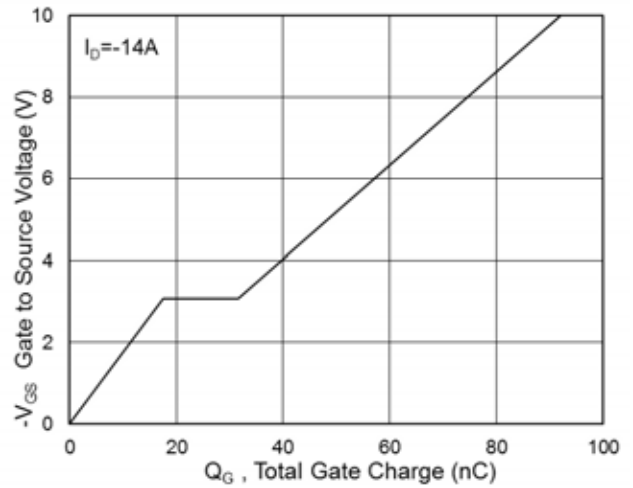


Fig.4 Gate-Charge Characteristics

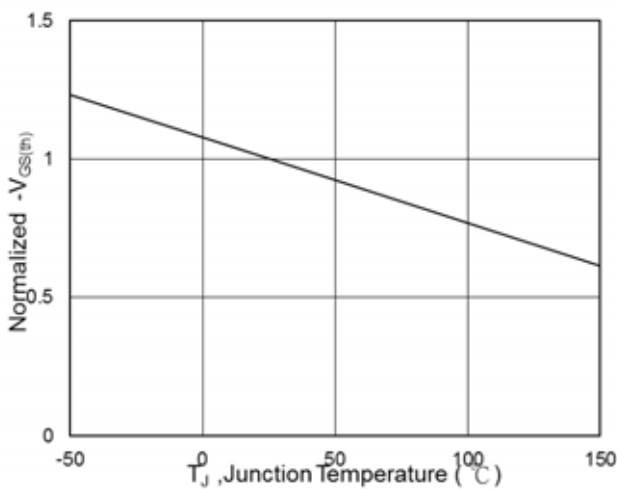


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

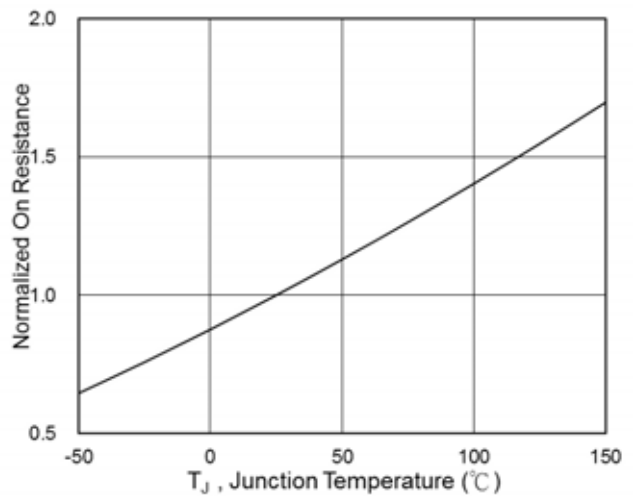


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

RATING AND CHARACTERISTICS CURVES (RM35P100T2)

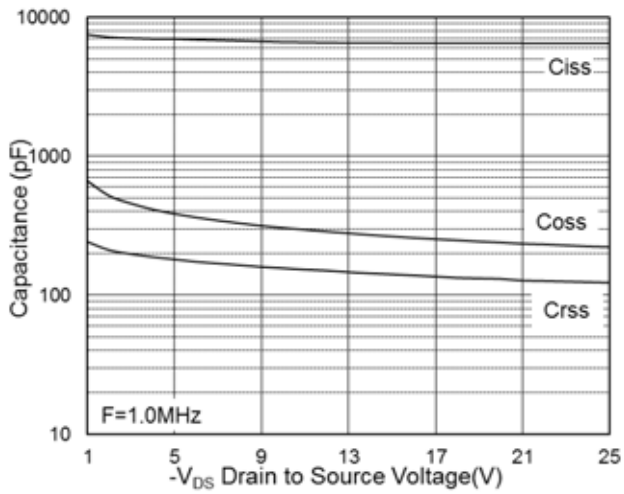


Fig.7 Capacitance

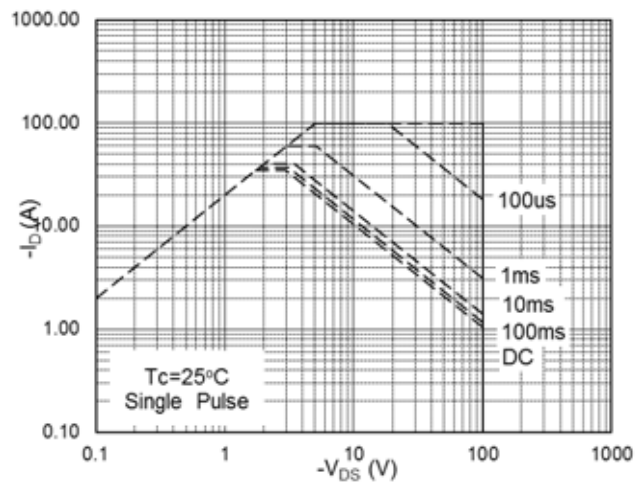


Fig.8 Safe Operating Area

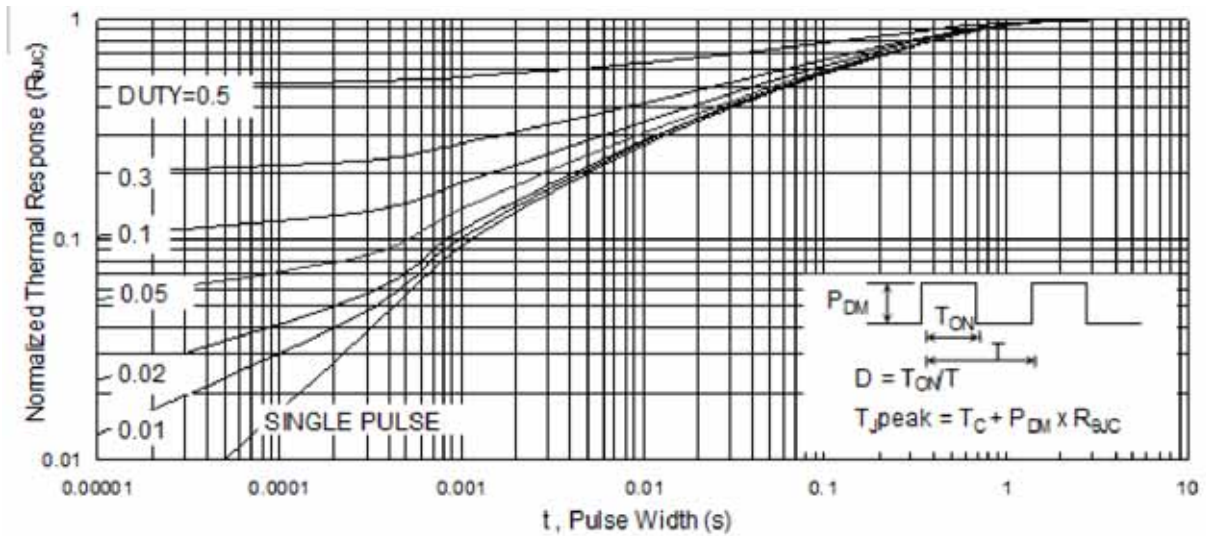


Fig.9 Normalized Maximum Transient Thermal Impedance

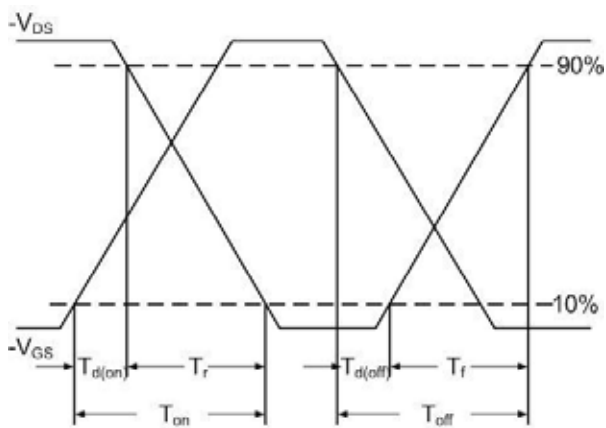


Fig.10 Switching Time Waveform

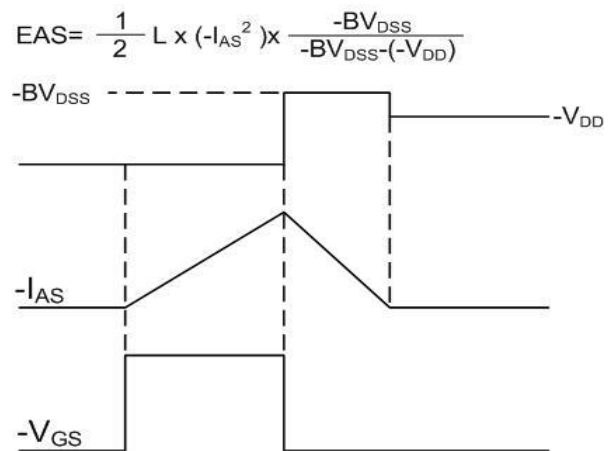
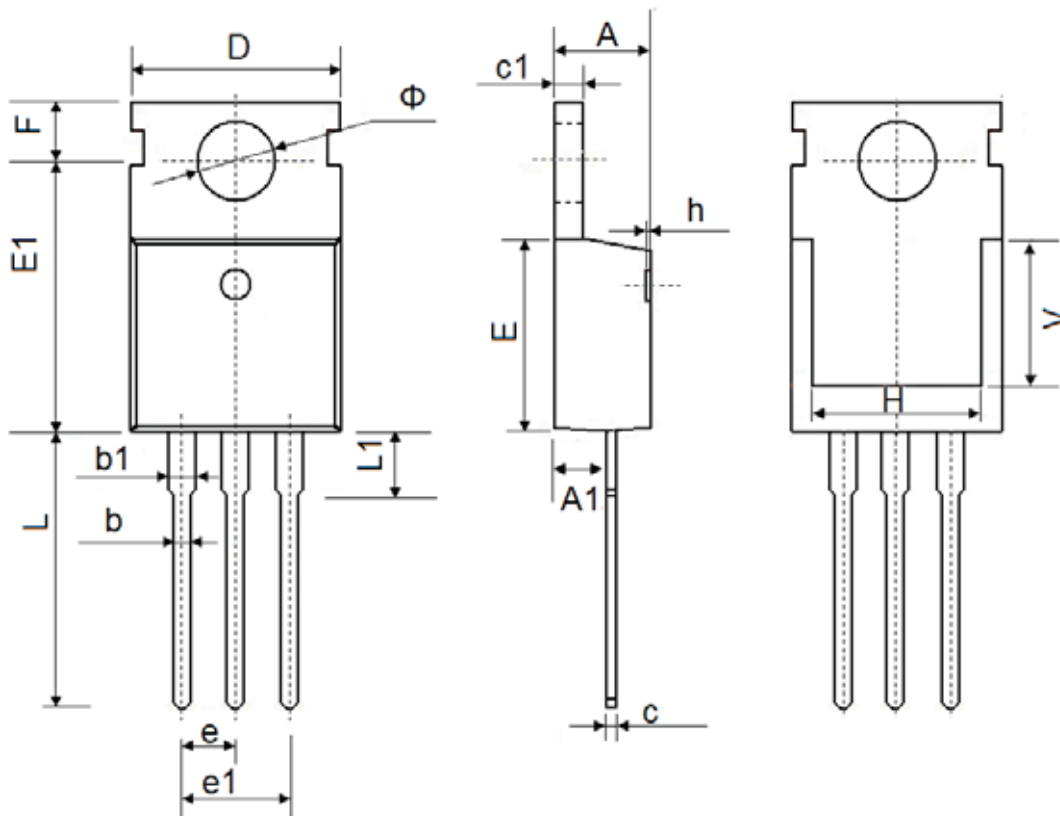


Fig.11 Unclamped Inductive Waveform

TO-220-3L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.400	4.600	0.173	0.181
A1	2.250	2.550	0.089	0.100
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.330	0.650	0.013	0.026
c1	1.200	1.400	0.047	0.055
D	9.910	10.250	0.390	0.404
E	8.9500	9.750	0.352	0.384
E1	12.650	12.950	0.498	0.510
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
F	2.650	2.950	0.104	0.116
H	7.900	8.100	0.311	0.319
h	0.000	0.300	0.000	0.012
L	12.900	13.400	0.508	0.528
L1	2.850	3.250	0.112	0.128
V	7.500 REF.		0.295 REF.	
Φ	3.400	3.800	0.134	0.150

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