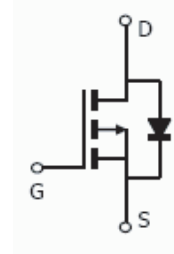


P-Channel Enhancement Mode Power MOSFET

Description

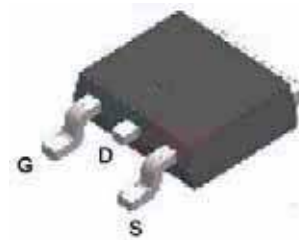
The RM60P60HD uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. This device is suitable for use in PWM, load switching and general purpose applications.



Schematic diagram

General Features

- $V_{DS} = -60V, I_D = -61A$
 $R_{DS(ON)} < 22m\Omega @ V_{GS} = -10V$
 $R_{DS(ON)} < 40m\Omega @ V_{GS} = -6V$
- High density cell design for ultra low R_{dson}
- Fully characterized avalanche voltage and current
- Special designed for converters and power controls
- Good stability and uniformity with high E_{AS}
- Excellent package for good heat dissipation
- Special process technology for high ESD capability
- Halogen-free
- P/N suffix V means AEC-Q101 qualified, e.g: RM60P60HDV



TO-263-2L top view
pin assignment

Application

- Power switching application
- Hard switched and High frequency circuits
- Uninterruptible power supply

100% UIS TESTED!

100% ΔV_{ds} TESTED!

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
60P60	RM60P60HD	TO-263-2L	-	-	-

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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	-60	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous	I_D	-61	A
Drain Current-Continuous($T_C=100^\circ C$)	$I_D(100^\circ C)$	-38.6	A
Pulsed Drain Current	I_{DM}	-244	A
Maximum Power Dissipation	P_D	171	W
Peak diode recovery voltage	dv/dt	15	V/ns
Derating factor		1.37	W/ $^\circ C$
Single pulse avalanche energy ^(Note 5)	E_{AS}	245	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)	$R_{\theta JC}$	0.73	$^{\circ}\text{C}/\text{W}$
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Electrical Characteristics ($T_C=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=-250\mu A$	-60	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-60V, V_{GS}=0V$	-	-	-1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
On Characteristics ^(Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1	-	-3	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-15A$	-	18	22	m Ω
		$V_{GS}=-6V, I_D=-8A$	-	30	40	m Ω
Forward Transconductance	g_{FS}	$V_{DS}=-10V, I_D=-5A$	-	10	-	S
Dynamic Characteristics ^(Note 4)						
Input Capacitance	C_{iss}	$V_{DS}=-25V, V_{GS}=0V,$ $F=1.0\text{MHz}$	-	4854	6000	PF
Output Capacitance	C_{oss}		-	178	480	PF
Reverse Transfer Capacitance	C_{rss}		-	133	150	PF
Switching Characteristics ^(Note 4)						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=-48V, I_D=-5A$ $V_{GS}=-10V, R_G=1\Omega$	-	23.1	46	nS
Turn-on Rise Time	t_r		-	76.2	150	nS
Turn-Off Delay Time	$t_{d(off)}$		-	113.5	220	nS
Turn-Off Fall Time	t_f		-	28.6	56	nS
Total Gate Charge	Q_g	$V_{DS}=-48V, I_D=-10A,$ $V_{GS}=-10V$	-	72	100	nC
Gate-Source Charge	Q_{gs}		-	19	30	nC
Gate-Drain Charge	Q_{gd}		-	9.8	16	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage ^(Note 3)	V_{SD}	$V_{GS}=0V, I_S=-1A$	-		-1.0	V
Diode Forward Current ^(Note 2)	I_S		-	-	-61	A

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: $T_J=25^{\circ}\text{C}, V_{DD}=-30V, V_{GS}=-10V, L=0.5\text{mH}, I_{AS}=31A$

RATING AND CHARACTERISTICS CURVES (RM60P60HD)

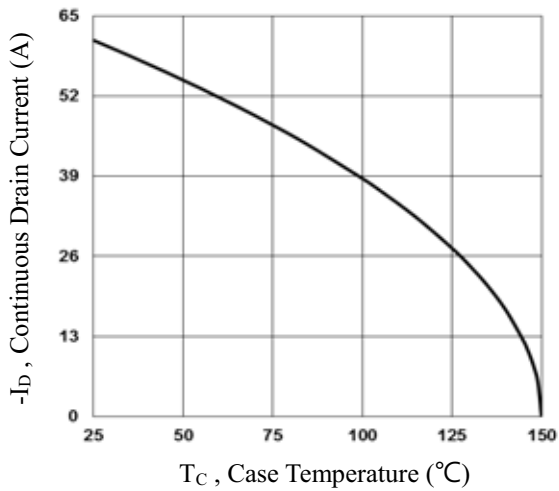


Fig.1 Continuous Drain Current vs. T_c

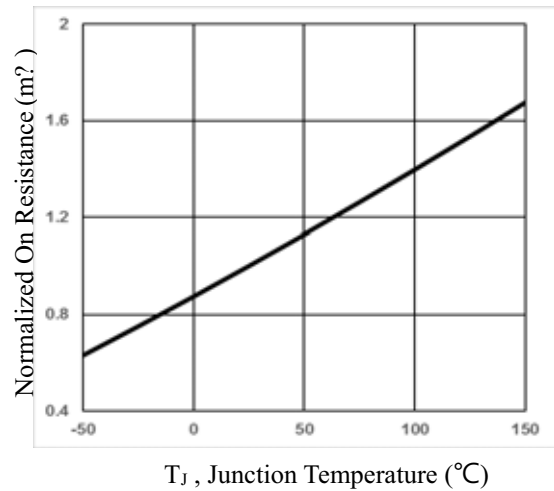


Fig.2 Normalized $R_{DS(on)}$ vs. T_j

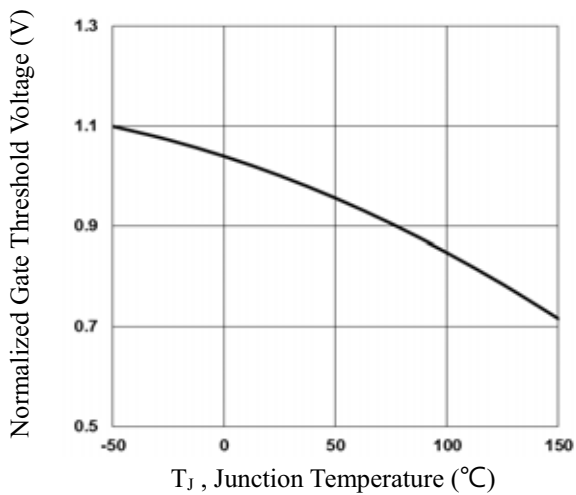


Fig.3 Normalized V_{th} vs. T_j

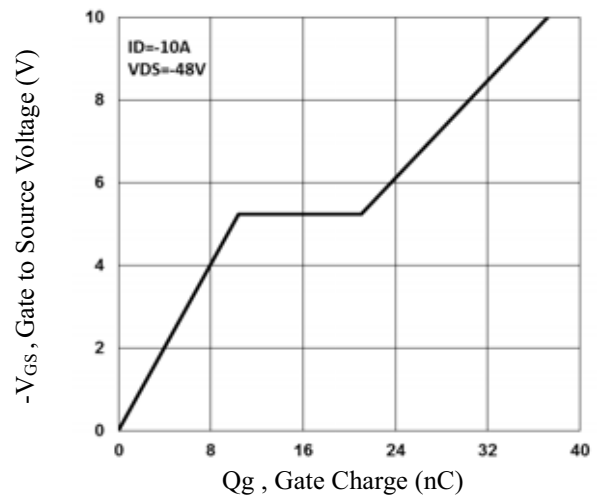


Fig.4 Gate Charge Waveform

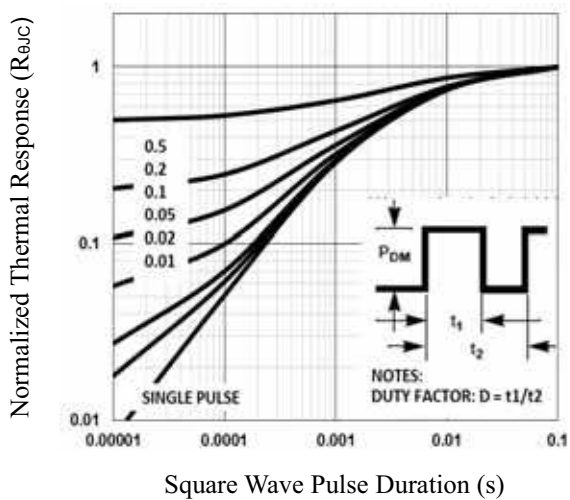


Fig.5 Normalized Transient Impedance

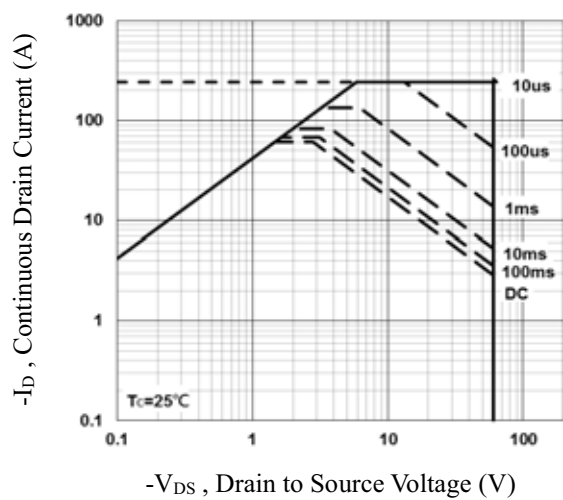
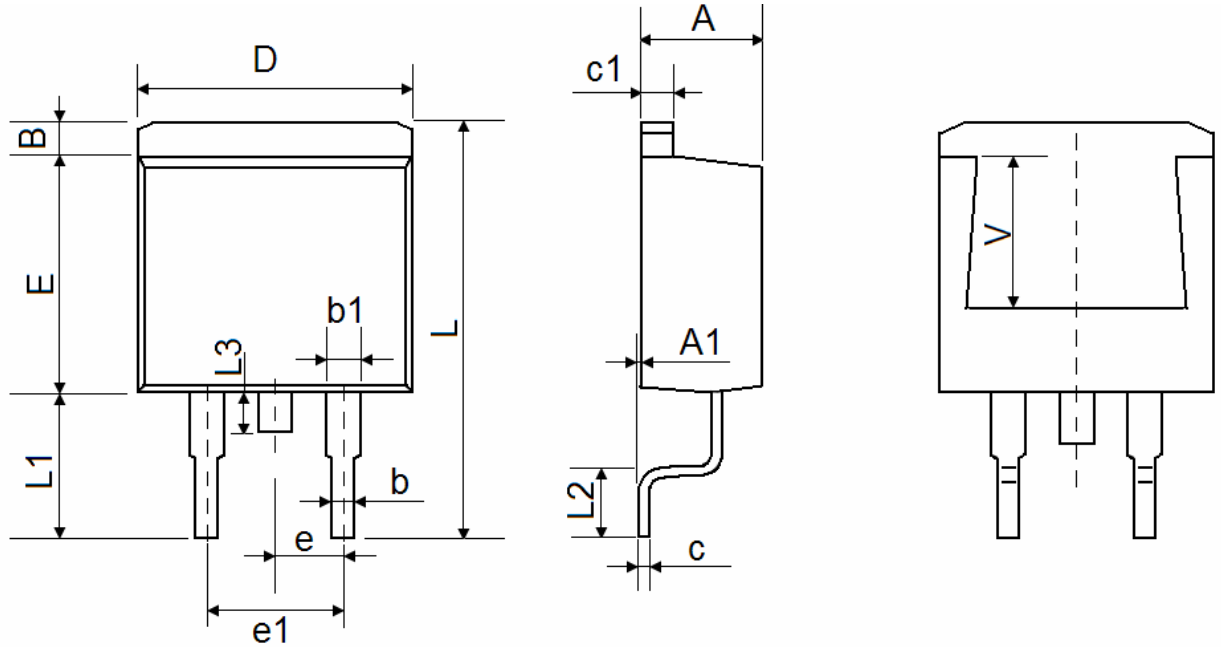


Fig.6 Maximum Safe Operation Area

TO-263-2L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.470	4.670	0.176	0.184
A1	0.000	0.150	0.000	0.006
B	1.170	1.370	0.046	0.054
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.310	0.530	0.012	0.021
c1	1.170	1.370	0.046	0.054
D	10.010	10.310	0.394	0.406
E	8.500	8.900	0.335	0.350
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
L	15.050	15.450	0.593	0.608
L1	5.080	5.480	0.200	0.216
L2	2.340	2.740	0.092	0.108
L3	1.300	1.700	0.051	0.067
V	5.600 REF		0.220 REF	

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