



VM3008

30V N-Channel MOSFETs

General Description

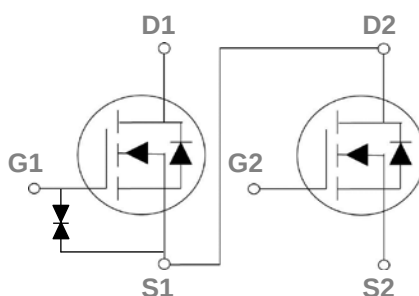
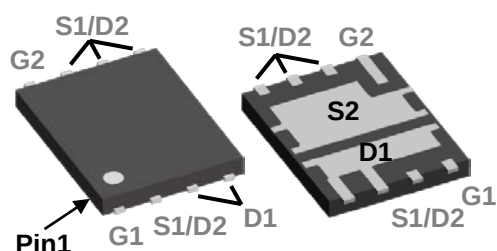
These N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency fast switching applications.

	BVDSS	RDSON	ID
Q1	30V	3.3mΩ	60A
Q2	30V	0.7mΩ	210A

Features

- Improved dv/dt capability
- Fast switching
- 100% EAS Guaranteed
- Green Device Available

PPAK5x6 Asymmetric Dual Pin Configuration



Applications

- MB / VGA / Vcore
- POL Buck Applications
- SMPS 2nd SR

Absolute Maximum Ratings $T_c=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Q1	Q2	Units
V_{DS}	Drain-Source Voltage	30	30	V
V_{GS}	Gate-Source Voltage	± 20	± 20	V
I_D	Drain Current – Continuous ($T_c=25^\circ\text{C}$)	60	210	A
	Drain Current – Continuous ($T_c=100^\circ\text{C}$)	38	134	A
I_{DM}	Drain Current – Pulsed ¹	240	840	A
EAS	Single Pulse Avalanche Energy ²	68	845	mJ
IAS	Single Pulse Avalanche Current ²	37	130	A
P_D	Power Dissipation ($T_c=25^\circ\text{C}$)	24	66	W
	Power Dissipation – Derate above 25°C	0.19	0.53	W/ $^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to 150		$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150		$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$ Q1	Thermal Resistance Junction to ambient ($t \leq 10s$)	---	40	$^\circ\text{C/W}$
$R_{\theta JA}$ Q2		---	40	$^\circ\text{C/W}$
$R_{\theta JC}$ Q1	Thermal Resistance Junction to Case	---	5.2	$^\circ\text{C/W}$
$R_{\theta JC}$ Q2		---	1.9	$^\circ\text{C/W}$



Electrical Characteristics ($T_J=25^\circ\text{C}$, unless otherwise noted)

Static State Characteristics

Symbol	Parameter	Conditions		Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V$, $I_D=250\mu A$	Q1	30	---	---	V
			Q2	30	---	---	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=27V$, $V_{GS}=0V$, $T_J=25^\circ\text{C}$	Q1	---	---	1	μA
			Q2	---	---	1	μA
		$V_{DS}=24V$, $V_{GS}=0V$, $T_J=85^\circ\text{C}$	Q1	---	---	10	μA
			Q2	---	---	10	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V$, $V_{DS}=0V$	Q1	---	---	± 20	μA
		$V_{GS}=20V$, $V_{DS}=0V$	Q2	---	---	100	nA
$R_{DS(ON)}$	Static Drain-Source On-Resistance ³	$V_{GS}=10V$, $I_D=20A$	Q1	---	2.75	3.3	$m\Omega$
		$V_{GS}=10V$, $I_D=35A$	Q2	---	0.55	0.7	$m\Omega$
		$V_{GS}=4.5V$, $I_D=15A$	Q1	---	4.7	6.2	$m\Omega$
		$V_{GS}=4.5V$, $I_D=25A$	Q2	---	0.9	1.2	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=250\mu A$	Q1	1.2	1.6	2.5	V
			Q2	1.2	1.6	2.5	V

Dynamic Characteristics³

Q _g	Total Gate Charge	V _{DS} =15V , V _{GS} =10V , I _D =30A	Q1	---	23	---	nC	
			Q2	---	96	---		
Q _g	Total Gate Charge	V _{DS} =15V , V _{GS} =4.5V , I _D =30A	Q1	---	12	---		
			Q2	---	47	---		
Q _{gs}	Gate-Source Charge		Q1	---	2	---		
			Q2	---	11	---		
Q _{gd}	Gate-Drain Charge		Q1	---	5.5	---		
			Q2	---	12	---		
T _{d(on)}	Turn-On Delay Time	V _{DD} =15V , V _{GS} =10V , R _G =6Ω I _D =30A	Q1	---	3	---	ns	
			Q2	---	10	---		
T _r	Rise Time		Q1	---	5	---		
			Q2	---	15	---		
T _{d(off)}	Turn-Off Delay Time		Q1	---	10	---		
			Q2	---	25	---		
T _f	Fall Time		Q1	---	5	---		
			Q2	---	35	---		



C _{iss}	Input Capacitance	V _{DS} =15V , V _{GS} =0V , F=1MHz	Q1	---	1200	---	pF
			Q2	---	6500	---	
C _{oss}	Output Capacitance		Q1	---	800	---	
			Q2	---	4100	---	
C _{rss}	Reverse Transfer Capacitance		Q1	---	60	---	
			Q2	---	25	---	
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	Q1	---	1.3	---	Ω
			Q2	---	2.1	---	Ω

Drain-Source Diode Characteristics

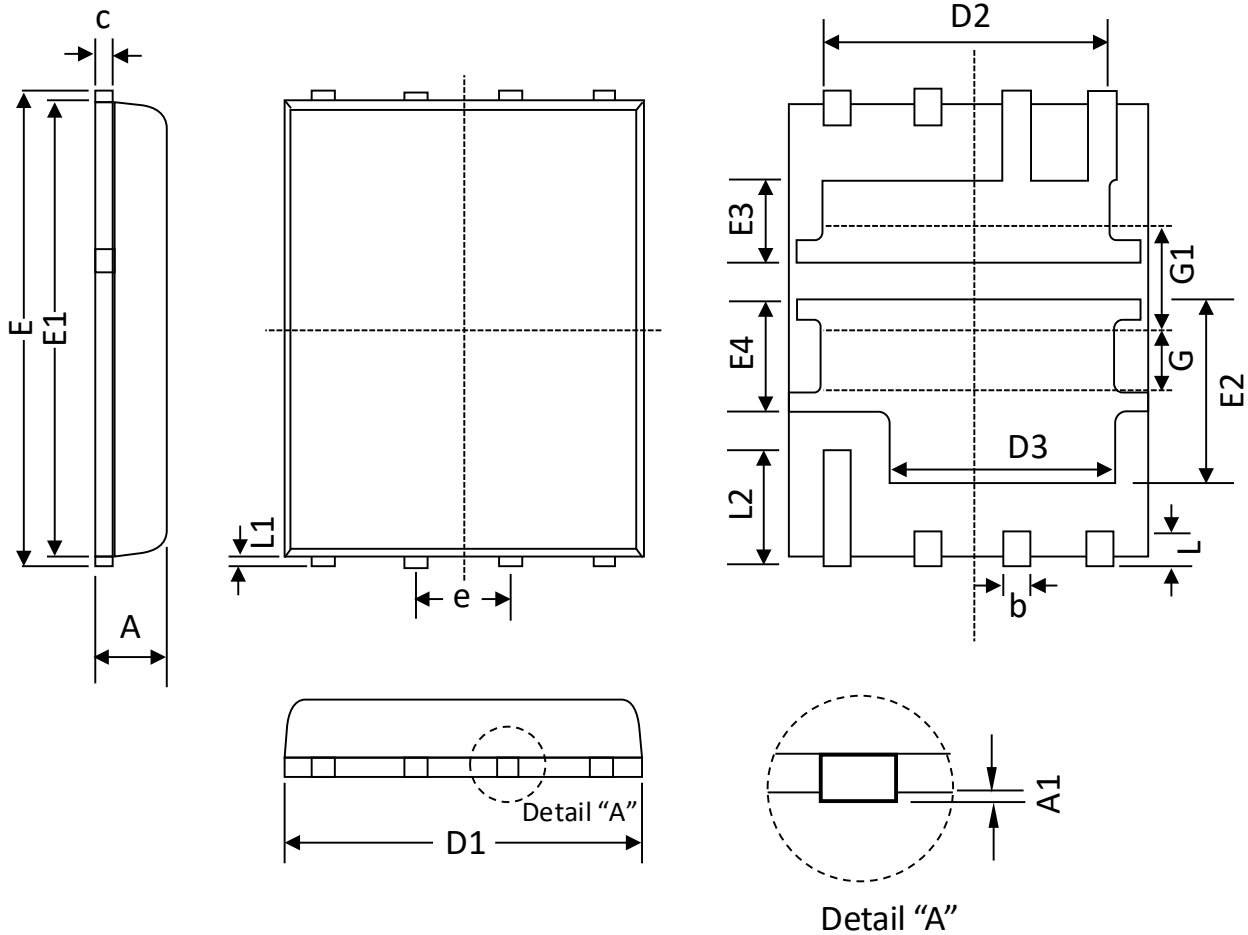
Symbol	Parameter	Conditions		Min.	Typ.	Max.	Unit
I _S	Continuous Source Current	V _G =V _D =0V , Force Current	Q1	---	---	60	A
			Q2	---	---	210	A
I _{SM}	Pulsed Source Current ³		Q1	---	---	120	A
			Q2	---	---	420	A
V _{SD}	Diode Forward Voltage ³	V _{GS} =0V , I _S =1A , T _J =25°C	Q1	---	---	1	V
			Q2	---	---	1	V

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD}=25V, V_{GS}=10V, L=0.1mH, Q1: I_{AS}=37A, Q2: I_{AS}=130A, R_G=25Ω, Starting T_J=25°C.
3. Essentially independent of operating temperature.



PPAK5x6 Asymmetric Dual Package Information



Symbol	mm		Symbol	mm	
	MAX	MIN		MAX	MIN
A	1.100	0.900	E2	2.480	2.280
A1	0.050	---	E3	1.150	0.950
b	0.510	0.330	E4	1.560	1.360
c	0.300	0.200	e	1.270 BSC	
D1	5.000	4.800	G	0.730 BSC	
D2	4.100	3.900	G1	1.500 BSC	
D3	3.160	2.960	L	0.580	0.380
E	6.100	5.900	L1	0.200	0.060
E1	5.800	5.700	L2	1.600	1.400



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