

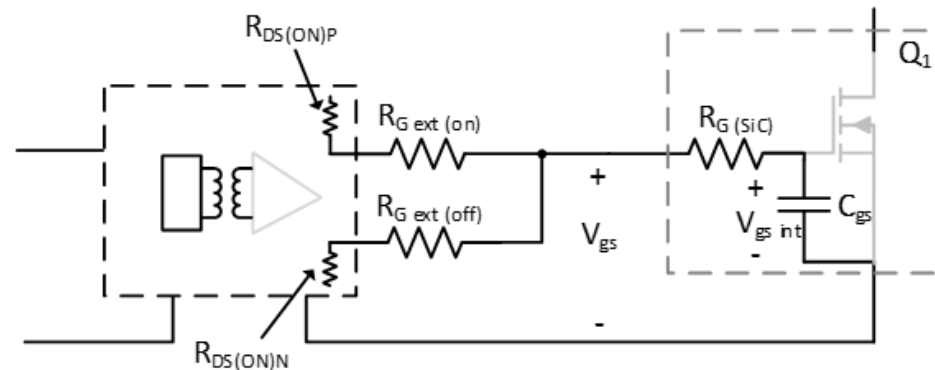
GATE DRIVER POWER DISSIPATION

- Total average power required to drive a SiC MOSFET gate is given by:

$$P_{gate}(W) = (\#Devices) * [Q_G * F_{SW} * (V_{G_ON} - V_{G_OFF})] * 10^{-6}$$

- F_{SW} = Switching frequency in kHz
 - Q_G = total gate charge in nC
 - $V_{G_ON} - V_{G_OFF}$ = total swing in gate voltage between from on to off
 - #Devices = number of parallel MOSFETs or modules
- This power will be dissipated in the gate driver's output stage, external R_G , and MOSFET internal R_G based on the ratio of the impedances
 - Select a gate driver that has a suitable power dissipation and resulting T_j based on desired switching frequency and MOSFET gate charge

$$P_{Driver} = P_{gate} * \left[\frac{1}{2} * \frac{R_{DS(ON)N}}{R_{DS(ON)N} + R_{ext(ON)} + R_G(SiC)} + \frac{1}{2} * \frac{R_{DS(ON)P}}{R_{DS(ON)P} + R_{ext(OFF)} + R_G(SiC)} \right]$$



TESTED AND RECOMMENDED GATE DRIVE SOLUTIONS (INDUSTRIAL)

MFG.	Part Number	AEC-Q100	Number of Channels	Working Voltage V _{IORM}	CMTI (V/ns)	Miller Clamp	Short-Circuit Detection	Program mable	Evaluation Boards	Reference Designs	Gate Driver Boards	Test Data / Reports
ADI	ADuM4121	-	1	849	150	Y	-	-	KIT-CRD-8FF90P KIT-CRD-8FF65P		EVAL-ADUM4121WHB1Z	ADuM4121 + C3M
ADI	ADuM4122	-	1	849	150	-	-	-			EVAL-ADUM4122WHB1Z	
ADI	ADuM4146	-	1	2150	100	Y	Y	-			EVAL-ADUM4146 CGD1700HB2P-BM2 CGD1700HB2P-BM3 CGD1700HB2P-XM3	
ADI	ADuM4221	-	2	849	150	-	-	-		CRD-06600DD065N		
Broadcom	ACFL-3161	-	1	1230	100	-	-	-	ACFL-3161			
Broadcom	ACPL-355JC	-	1	2262	100	Y	Y	-	ACPL-355JC (BM3)		ACPL-355JC	

Note: A “Y” indicates that at least some of the model options in the driver family have the qualification/feature

TESTED AND RECOMMENDED GATE DRIVE SOLUTIONS (AUTOMOTIVE QUALIFIED)

MFG.	Part Number	AEC-Q100	Number of Channels	Working Voltage V _{IORM}	CMTI (V/ns)	Miller Clamp	Short-Circuit Detection	Program mable	Evaluation Boards	Reference Designs	Gate Driver Boards	Test Data / Reports
ADI	ADuM4135	Y	1	849	100	Y	Y	-		CRD300DA12E-XM3 CRD600DA12E-XM3	CGD1200HB2P-BM3 CGD1200HB2P-BM2 CGD12HBXP	
ADI	ADuM4137/8	Y	1	849	150	Y	Y	Y				Short Circuit Test
ADI	ADuM4177	Y	1	1500	150	Y	Y	Y		Coming soon	Coming Soon	
NXP	GD3160	Y	1	1500	100	Y	Y	Y		EV-INVERTERHD	FRDMGD3160XM3EVM FRDMGD31RPEVM	
Skyworks	Si823Hx	Y	1 or 2	1000	125	-	-	-			SI823H-AAWA-KIT	
Skyworks	Si827x	Y	1 or 2	630	200	-	-	-				
Skyworks	Si828x	Y	1	1414	125	Y	Y	-	SI828X-HB-EVB		XM3 Driver Board	Si828x + XM3 Si828x + C3M
TI	UCC21520/30	Y	2	2121	100	-	-	-		TIDA-01604 TIDM-02002 TIDA-010054		
TI	UCC21710/50	Y	1	2121	150	Y	Y	-		CRD25AD12N-FMC	CGD1700HB2M-UNA UCC21710QDWEVM-054 UCC21750QDWEVM-054	
TI	UCC5350MC	Y	1	990	100	Y	-	-		CRD-06600FF065N CRD-03600AD065N-L CRD-02AD065N CRD-22DD12N CRD-22AD12N CRD-30DD12N-K		
TI	UCC5880	Y	1	1414	150	Y	Y	Y		TIDM-02014	UCC5880QEV-057	

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