X3D2R85P

30V Dual N-Channel MOSFETs

General Description

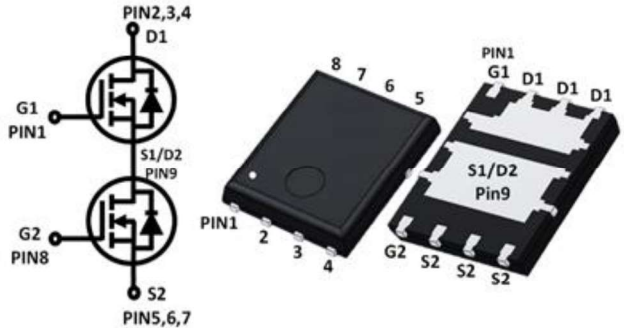
These Dual N-Channel enhancement mode power field effect transistors are using trench - technology. This advanced technology is designed to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche period. These devices are well suited for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

	BV_{DSS}	$R_{DS(ON)}$	I_D
Q1	30V	5.0mΩ	58A
Q2	30V	2.8mΩ	110A

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_J=25°C, unless otherwise noted)

Symbol	Parameter		Q1	Q2	Unit
V_{DS}	Drain-Source Voltage		30	30	V
V_{GS}	Gate-Source Voltage		±20	+20/-16	
I_D	Drain Current-Continuous [A]	T_A = 25°C	18	27	A
		T_A = 70°C	14	20	
		T_C = 25°C	58	110	
		T_C = 100°C	34	65	
I_{DM}	Drain Current-Pulsed [A, B]	T_A = 25°C	125	240	
I_{AS}	Non-repetitive Avalanche Current [E]		25	36	
E_{AS}	Single Pulse Drain-to-Source Avalanche Energy [E]		31.2	64.8	mJ
P_{tot}	Maximum Power Dissipation	T_A = 25°C	3.1	3.6	W
		T_C = 25°C	31.3	54.3	W/°C
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +150		°C

Thermal Characteristics

Symbol	Parameter	Conditions	Q1	Q2	Unit
$R_{\theta JA}$	Junction-to-Ambient [C]	Steady State	40	35	°C/W
$R_{\theta JC}$	Junction-to-Case	Steady State	4	2.2	°C/W

Q1_Electrical Characteristics (T_J=25°C, unless otherwise noted)

Static State Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = 250μA	30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 27V, V_{GS} = 0V	-	-	1	μA
		V_{DS} = 24V, V_{GS} = 0V, T_J = 125°C	-	-	10	μA
I_{GSS}	Gate-Source Leakage Current	V_{GS} = ±20V, V_{DS} = 0V	-	-	±20	μA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	1.2	1.7	2.5	V
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS} = 10V, I_{DS} = 20A	-	4.2	5	mΩ
		V_{GS} = 4.5V, I_{DS} = 15A	-	6.4	8.3	mΩ
g_{fs}	Forward Transconductance	V_{DS} = 5V, I_D = 30A	-	18	-	S

Dynamic Characteristics Note D

Symbol	Parameter		Conditions	Min.	Typ.	Max.	Unit
C_{iss}	Input Capacitance		V_{DS} = 15V, V_{GS} = 0V, f = 1MHz	-	840	-	pF
C_{oss}	Output Capacitance			-	580	-	pF
C_{rss}	Reverse Transfer Capacitance			-	35	-	pF
R_g	Gate Resistance		V_{DS} = 0V, f = 1MHz	-	1.3	-	Ω
Q_g	Total Gate charge	V_{GS} = 10V	V_{DD} = 15V, I_{DS} = 30A	-	15	-	nC
		V_{GS} = 4.5V		-	7.2	-	nC
Q_{gs}	Gate to Source Charge			-	3.4	-	nC
Q_{gd}	Gate to Drain Charge			-	2.8	-	nC
$T_{d(on)}$	Turn-On Delay Time		V_{DD} = 15V, V_{GS} = 10V, I_{DS} = 30A, $R_{G,ext}$ = 3Ω	-	6	-	ns
t_r	Rise Time			-	78	-	ns
$T_{d(off)}$	Turn-Off Delay Time			-	13	-	ns
t_f	Fall Time			-	81	-	ns

Drain-Source Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Diode continuous forward current	-	-	-	58	A
I_{SM}	Diode pulse current B	-	-	-	125	A
V_{SD}	Diode Forward Voltage B	V_{GS} = 0V, I_S = 1A	-	-	1	V
t_{rr}	Diode Reverse Recovery Time	I_S = 30A, di/dt = 100A/μs	-	22	-	ns
Q_{rr}	Diode Reverse Recovery Charge		-	11	-	nC