A.Dual N-Channel 30-V (D-S) MOSFET

PRODUCT SUMMARY			
V_{DS} (V)	$R_{DS(on)}$ (Ω) MAX.	I_D (A) [a]	Q_g (TYP.)
30	0.008 at V_{GS} = 10V	26	15 nC

FEATURES

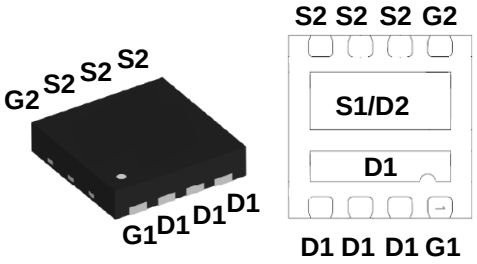
- DT-Trench Power MOSFET
- 100 % R_g and UIS tested
- ESD Protection Diode Embedded

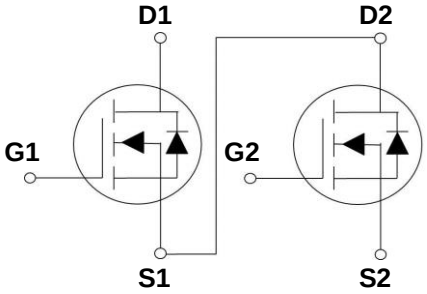
RoHS COMPLIANT

APPLICATIONS

- MB / VGA / Vcore
- POLBuckApplications

DFN3x3 Asymmetric Dual Pin Configuration





Absolute Maximum Ratings Tc=25℃ 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˚C)	26	26	A
	Drain Current – Continuous (T_C=100˚C)	18.7	18.7	A
	Drain Current – Continuous (T_A=25˚C)	13.9	13.9	A
	Drain Current – Continuous (T_A=100˚C)	8.9	8.9	A
I_{DM}	Drain Current – Pulsed[1]	100	100	A
EAS	Single Pulse Avalanche Energy[2]	20	20	mJ
IAS	Single Pulse Avalanche Current[2]	20	20	A
P_D	Power Dissipation (T_C=25˚C)	27	27	W
	Power Dissipation – Derate above 25˚C	0.01	0.01	W/˚C
T_{STG}	Storage Temperature Range	-55 to 150		˚C
T_J	Operating Junction Temperature Range	-55 to 150		˚C

Electrical Characteristics (T_J=25 ℃, unless otherwise noted)

Symbol		Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Q1	Thermal Resistance Junction to ambient	---	61	˚C/W
$R_{\theta JA}$	Q2		---	61	˚C/W
$R_{\theta JC}$	Q1	Thermal Resistance Junction to Case	---	4.5	˚C/W
$R_{\theta JC}$	Q2		---	4.5	˚C/W

Absolute Maximum Ratings Tc=25°C unless otherwise noted

PARAMETER	SYMBOL	TEST CONDITIONS		MIN.	TYP.	MAX.	UNIT
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	Q1	30	---	---	V
			Q2	30	---	---	V
$\triangle BV_{DSS}/\triangle T_J$	BV_{DSS} Temperature Coefficient	Reference to 25°C , I_D=1mA	Q1	---	0.04	---	V/°C
			Q2	---	0.04	---	V/°C
I_{DSS}	Drain-Source Leakage Current	V_{DS}=30V , V_{GS}=0V , T_J=25°C	Q1	---	---	1	uA
			Q2	---	---	1	uA
		V_{DS}=24V , V_{GS}=0V , T_J=125°C	Q1	---	---	10	uA
			Q2	---	---	10	uA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	Q1	---	---	±100	nA
			Q2	---	---	±100	nA
$R_{DS(ON)}$	Static Drain-Source On-Resistance[3]	V_{GS}=10V , I_D=10A	Q1	---	8.0	10.5	mΩ
		V_{GS}=10V , I_D=10A	Q2	---	8.0	10.5	mΩ
		V_{GS}=4.5V , I_D=5A	Q1	---	11	14	mΩ
		V_{GS}=4.5V , I_D=5A	Q2	---	11	14	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	Q1	1.2	1.6	2.5	V
			Q2	1.2	1.6	2.5	V
$\triangle V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		Q1	---	-4	---	mV/°C
			Q2	---	-4	---	mV/°C
gfs	Forward Transconductance	V_{DS}=5V , I_D=5A	Q1	---	12	---	S
		V_{DS}=5V , I_D=5A	Q2	---	12	---	S
Dynamic Characteristics							
Q_g	Total Gate Charge[3,4]	V_{DS}=15V , V_{GS}=10V , I_D=5A	Q1	---	15	32	nC
			Q2	---	15	32	
Q_{gs}	Gate-Source Charge[3,4]		Q1	---	2.2	5	
			Q2	---	2.2	5	
Q_{gd}	Gate-Drain Charge[3,4]		Q1	---	3	6	
			Q2	---	3	6	
$T_{d(on)}$	Turn-On Delay Time[3,4]	V_{DD}=15V , V_{GS}=10V , R_G=6Ω I_D=1A	Q1	---	3.8	7	ns
			Q2	---	3.8	7	
T_r	Rise Time[3,4]		Q1	---	10	19	
			Q2	---	10	19	
$T_{d(off)}$	Turn-Off Delay Time[3,4]		Q1	---	22	43	
			Q2	---	22	43	
T_f	Fall Time[3,4]		Q1	---	6.6	14	
			Q2	---	6.6	14	

Absolute Maximum Ratings Tc=25°C unless otherwise noted

Symbol	Parameter	Conditions		Min.	Typ.	Max.	Unit
C_{iss}	Input Capacitance	V_{DS}=25V , V_{GS}=0V , F=1MHz	Q1	---	625	900	pF
			Q2	---	625	900	
C_{oss}	Output Capacitance		Q1	---	84	125	
			Q2	---	84	125	
C_{rss}	Reverse Transfer Capacitance		Q1	---	62	90	
			Q2	---	62	90	
R_g	Gate resistance	V_{GS}=0V, V_{DS}=0V, F=1MHz	Q1	---	2.8	5.6	Ω
			Q2	---	2.8	5.6	Ω
Drain-Source Diode Characteristics							
I_S	Continuous Source Current	V_G=V_D=0V , Force Current	Q1	---	---	26	A
			Q2	---	---	26	A
I_{SM}	Pulsed Source Current[3]		Q1	---	---	42	A
			Q2	---	---	42	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}=16A,Q2:I_{AS}=42A,R_G=25Ω,Starting T_J=25°C.
3. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.
4. Essentially independent of operating temperature.

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

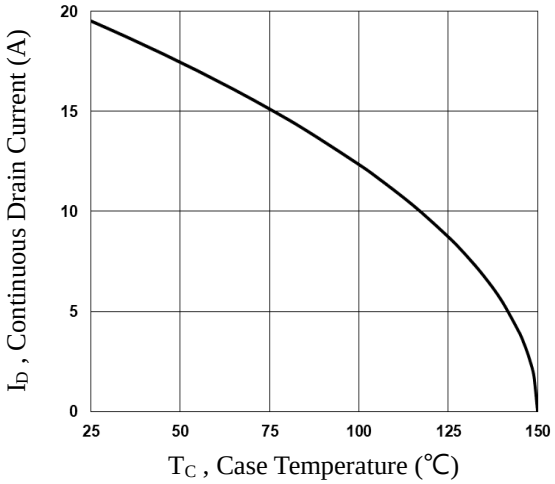


Fig.1 Q1 Continuous Drain Current vs. T_C

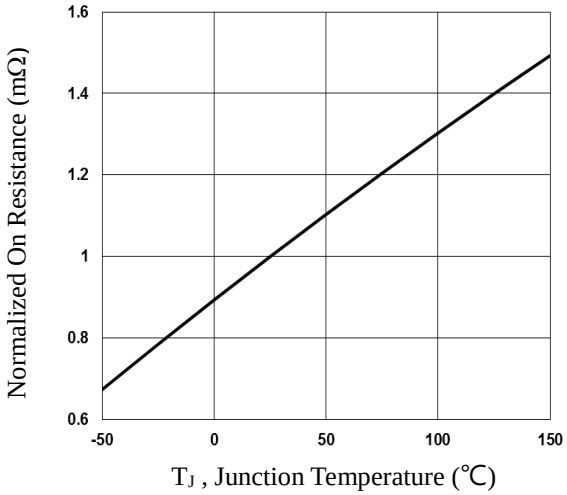


Fig.2 Q1 Normalized RDSON vs. T_J

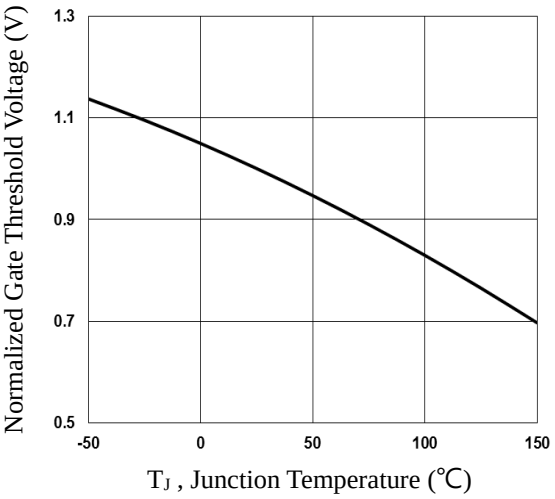


Fig.3 Q1 Normalized V_{th} vs. T_J

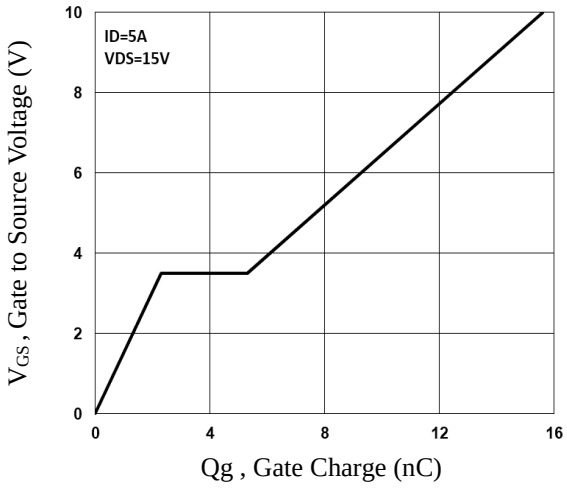


Fig.4 Q1 Gate Charge Waveform

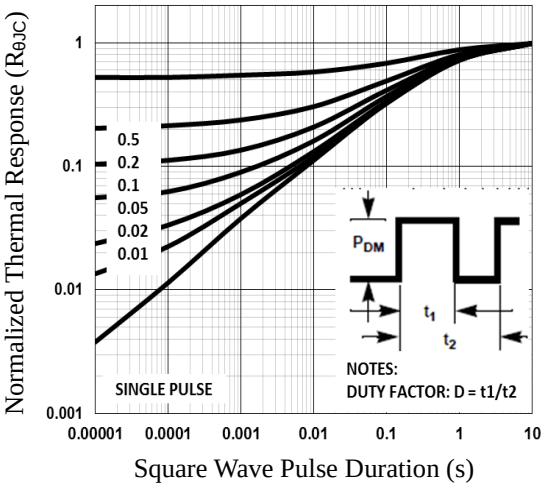


Fig.5 Q1 Normalized Transient Impedance

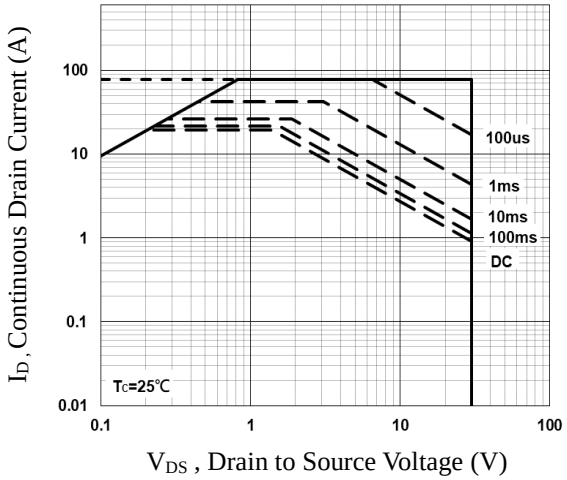


Fig.6 Q1 Maximum Safe Operation Area

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

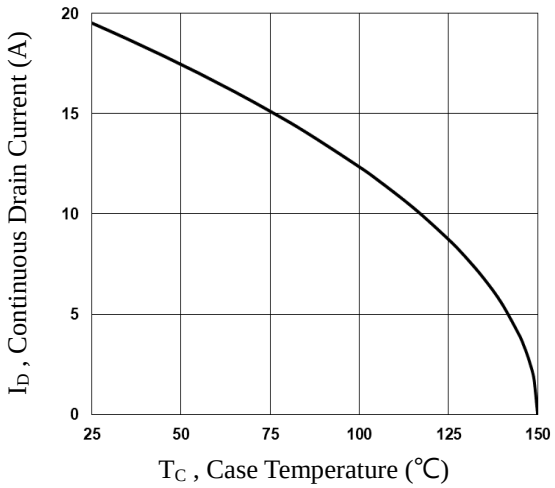


Fig.7 Q2 Continuous Drain Current vs. T_C

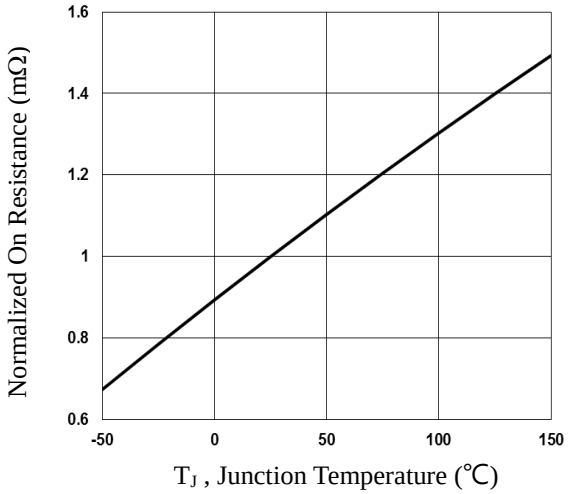


Fig.8 Q2 Normalized RDSON vs. T_J

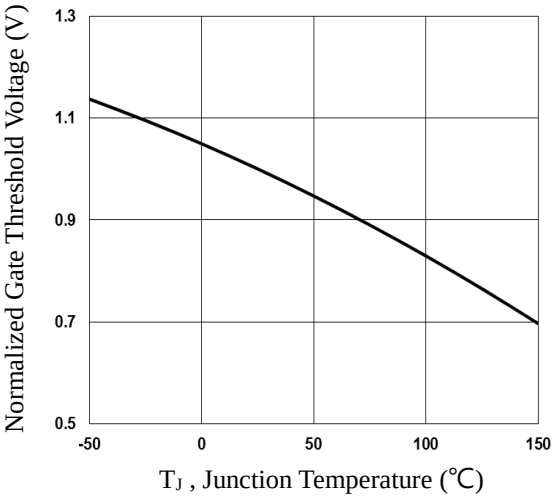


Fig.9 Q2 Normalized V_{th} vs. T_J

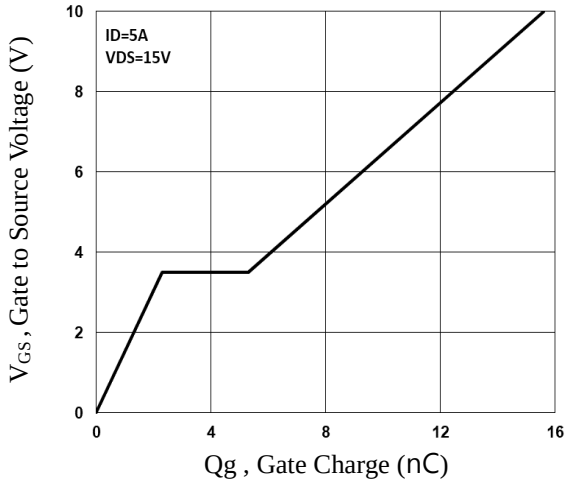


Fig.10 Q2 Gate Charge Waveform

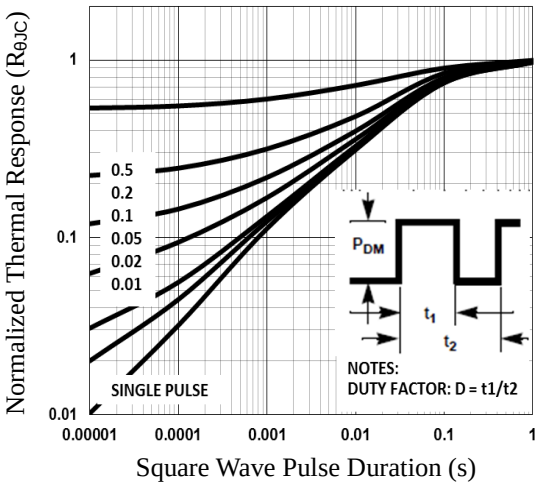


Fig.11 Q2 Normalized Transient Impedance

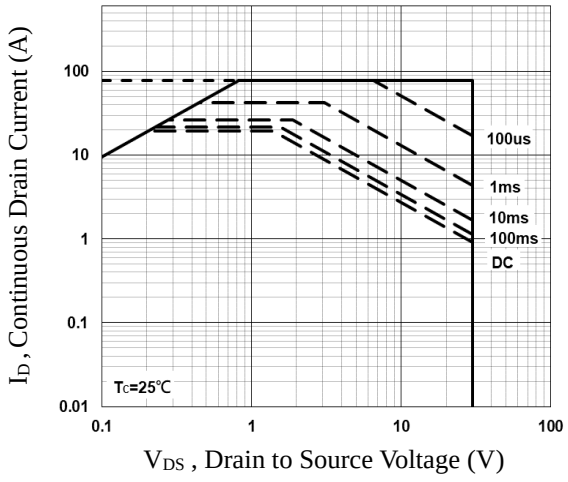


Fig.12 Q2 Maximum Safe Operation Area

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