N-Channel 30 V (D-S) MOSFET

PRODUCT SUMMARY			
V_{DS} (V)	$R_{DS(on)}$ (mΩ)(Typ.)	I_D (A)[a]	Q_g (Typ.)
30	7 at V_{GS} = 10 V	42	16.7 nC
	10 at V_{GS} = 4.5 V		

FEATURES

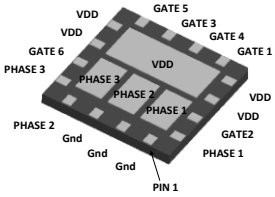
- DT-Trench Power MOSFET
- Improved dv/dt Capability
- Fast switching
- 100% EAS Guaranteed
- Green Device Available

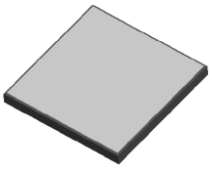
RoHS COMPLIANT

APPLICATIONS

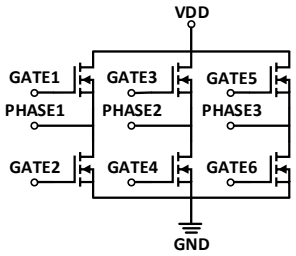
- 3-PHASE Applications

DFN6×6 6 IN 1 Pin Configuration





Cu Exposed Pad



Schematic Diagram

ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C, unless otherwise noted)				
PARAMETER		**SYMBOL**	**LIMIT**	**UNIT**
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current (T_J = 150 °C)[a]	T_A = 25 °C	I_D	42	A
	T_A = 100 °C		26.6	
Pulsed Drain Current[b]		I_{DM}	168	
Single Avalanche Energy		E_{AS}	45	mJ
Maximum Power Dissipation[c]	T_A = 25 °C	P_D	24.7	W
	T_A = 100 °C		9.9	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	- 55 to 150	°C

THERMAL RESISTANCE RATINGS			
PARAMETER	**SYMBOL**	**LIMIT**	**UNIT**
Junction-to-Case (Drain)	R_{thJA}	62	°C/W
Junction-to-Case (Drain)	R_{thJC}	5.06	

Notes

a. Calculated continuous current based on maximum allowablejunction temperature.
b. Repetitive rating; pulse width limited by max. junction temperature.
c. Pd is based on max. junction temperature, using junction-case thermal resistance.
d. The value of $R_{\theta JA}$is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper,in a still air environment with Ta=25 °C.

SPECIFICATIONS (T_A = 25 °C, unless otherwise noted)						
PARAMETER	**SYMBOL**	**TEST CONDITIONS**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Static						
Drain-Source Breakdown Voltage	V_{DS}	V_{GS} = 0 V, I_D = 250 µA	30	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 µA	1.2	-	2.5	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 20 V	-	-	± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 30 V, V_{GS} = 0 V	-	-	1	µA
		V_{DS} = 24 V, V_{GS} = 0 V, T_J = 125 °C	-	-	10	
On-State Drain Current [a]	$I_{D(on)}$	V_{DS} ≥ 5 V, V_{GS} = 10 V	42	-	-	A
Drain-Source On-State Resistance [a]	$R_{DS(on)}$	V_{GS} = 10 V, I_D = 16 A	-	7	8.5	mΩ
		V_{GS} = 4.5 V, I_D = 8 A	-	10	13	
Forward Transconductance [a]	g_{fs}	V_{DS} = 10 V, I_D = 8 A	-	9.5	-	S
Dynamic [b]						
Input Capacitance	C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz	-	850	-	pF
Output Capacitance	C_{oss}		-	133	-	
Reverse Transfer Capacitance	C_{rss}		-	78	-	
Total Gate Charge [c]	Q_g	V_{DS} = 15 V, V_{GS} = 10 V, I_D = 20 A	-	16.7	-	nC
Gate-Source Charge [c]	Q_{gs}		-	4.5	-	
Gate-Drain Charge [c]	Q_{gd}		-	1.3	-	
Gate Resistance	R_g	f = 1 MHz	-	2.7	-	Ω
Turn-On Delay Time [c]	$t_{d(on)}$	V_{DD} = 15 V, I_D = 15 A, R_g = 3.3 Ω, V_{GS} = 10 V	-	4.8	-	ns
Rise Time [c]	t_r		-	12.5	-	
Turn-Off Delay Time [c]	$t_{d(off)}$		-	27.6	-	
Fall Time [c]	t_f		-	8.2	-	
Drain-Source Body Diode Ratings and Characteristics [b] (T_A = 25 °C)						
Continuous Source-Drain Diode Current	I_S	T_A = 25 °C	-	-	42	A
Pulsed Current	I_{SM}		-	-	84	A
Forward Voltage [a]	V_{SD}	I_F = 1 A, V_{GS} = 0 V	-	-	1	V
Reverse Recovery Time	t_{rr}	I_F = 10 A, di/dt = 100 A/µs	-	8.1	-	ns
Reverse Recovery Charge	Q_{rr}		-	1.6	-	nC

Notes

a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %.

b. Guaranteed by design, not subject to production testing.

c. Independent of operating temperature.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

TYPICAL CHARAC TERISTICS (25 °C, unless otherwise noted)

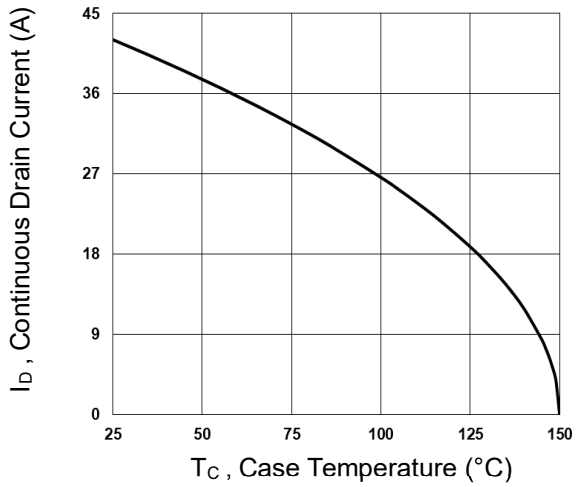


Fig.1 Continuous Drain Current vs. T_C

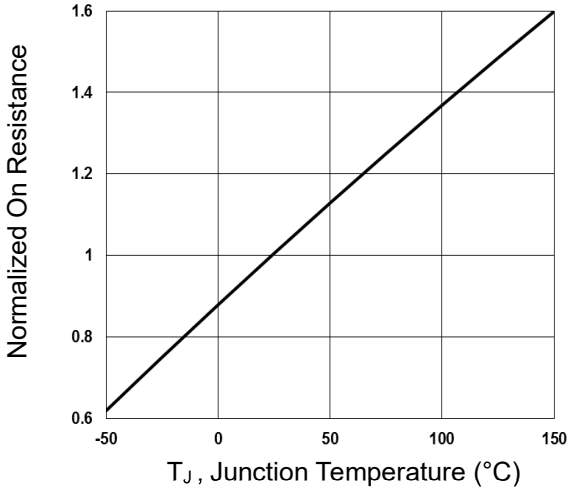


Fig.2 Normalized RDSON vs. T_J

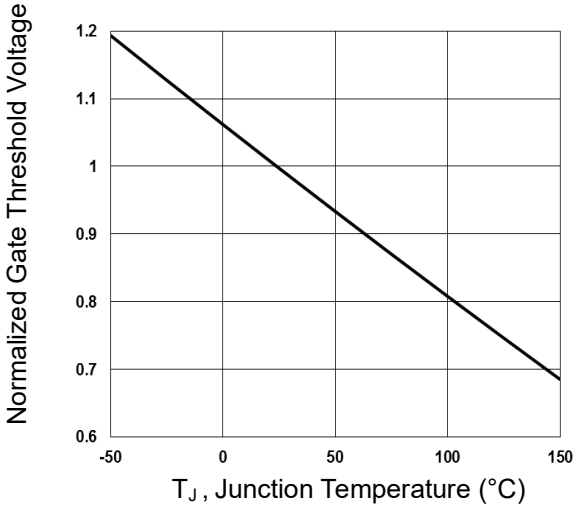


Fig. 3 Normalized V_{th} vs. T_J

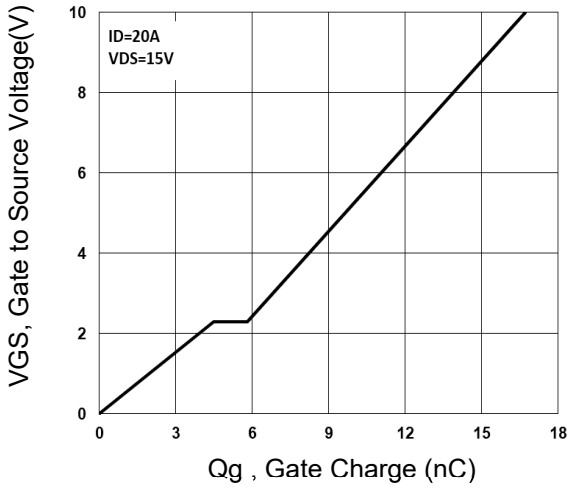


Fig. 4 Gate Charge Waveform

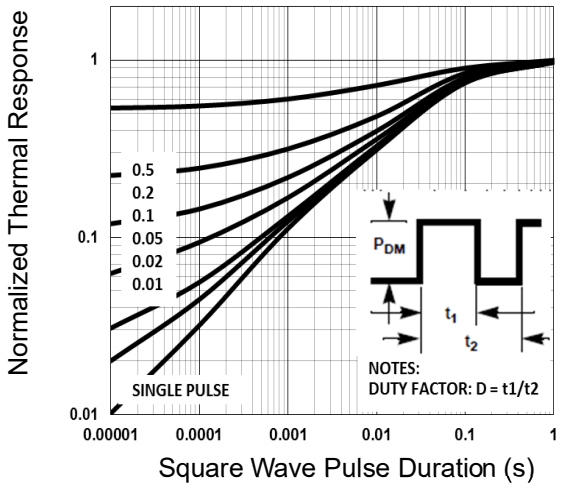


Fig. 5 Normalized Transient Impedance

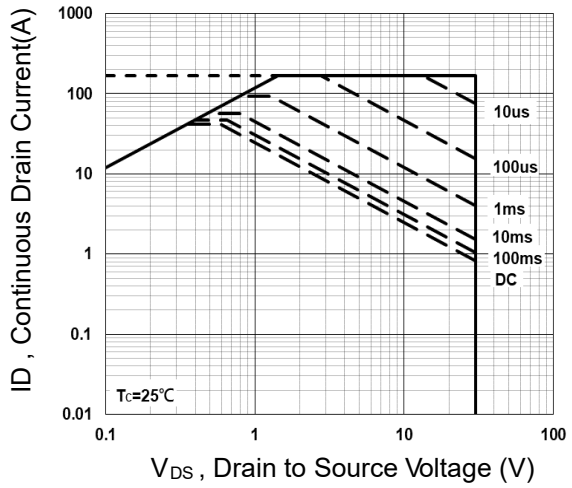


Fig. 6 Maximum Safe Operation Area

TYPICAL CHARAC TERISTICS (25 °C, unless otherwise noted)

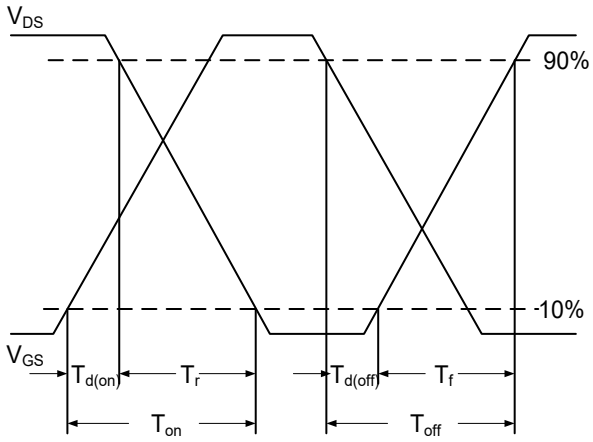


Fig. 7 Switching Time Waveform

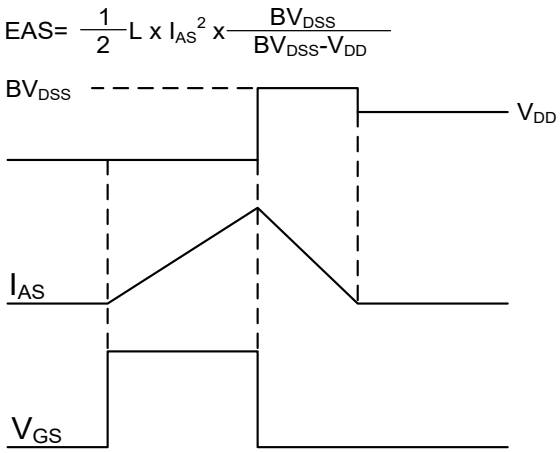
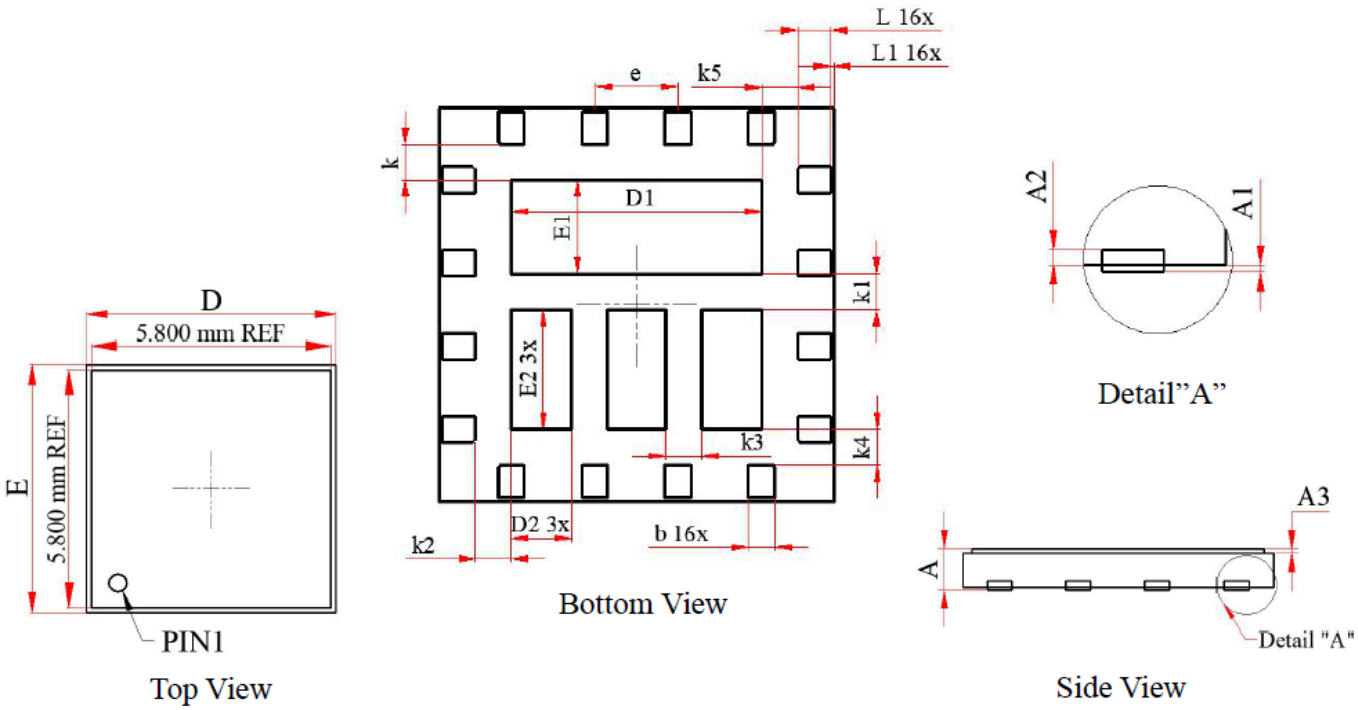


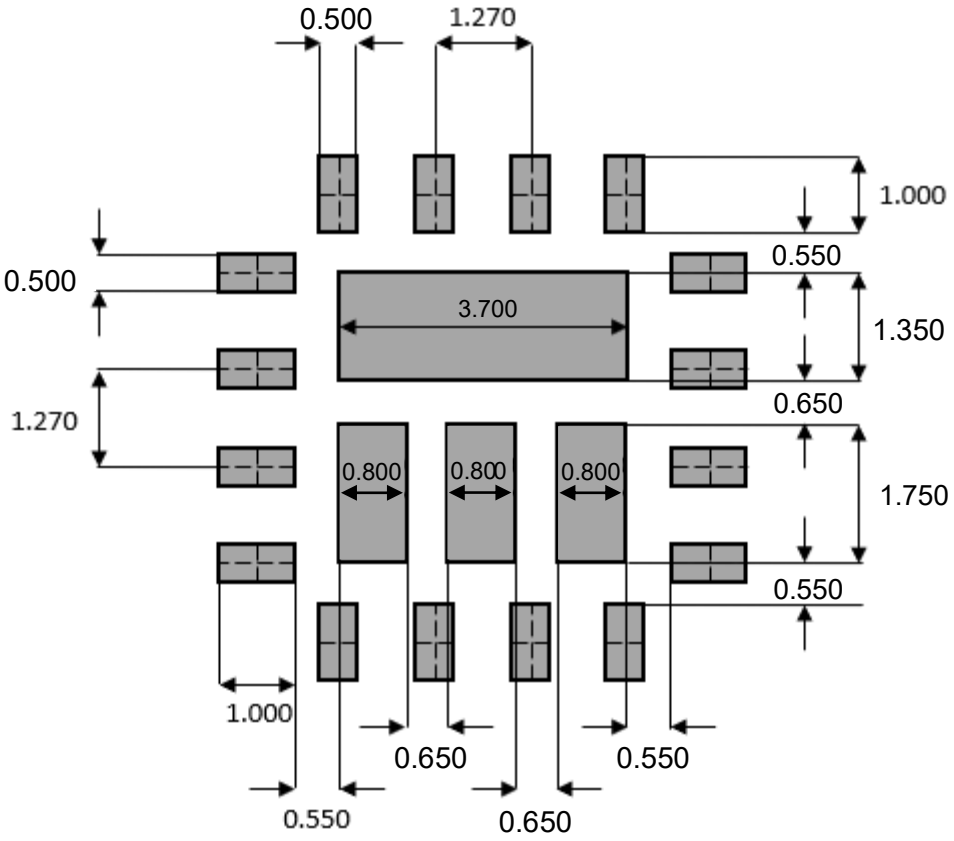
Fig. 8 EAS Waveform

DFN6X6 6 IN 1 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters			Symbol	Dimensions In Millimeters		
	MIN	Normal	MAX		MIN	Normal	MAX
A	0.530	---	0.600	b	0.350	0.400	0.450
A1	---	---	0.005	L	0.450	0.500	0.550
A2	0.030	---	0.100	L1	0.010	0.050	0.090
A3	0.050	---	0.100	k	0.550 REF		
D	5.900	6.000	6.100	k1	0.550 REF		
E	5.900	6.000	6.100	k2	0.550 REF		
D1	3.700	3.800	3.900	k3	0.550 REF		
E1	1.325	1.425	1.525	k4	0.550 REF		
D2	0.800	0.900	1.000	k5	0.550 REF		
E2	1.725	1.825	1.925	e	1.27 BSC		

DFN6X6 6 IN 1 RECOMMENDED FOOTPRINT



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