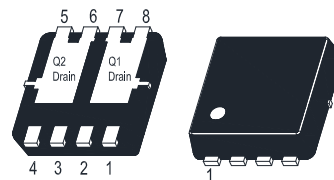
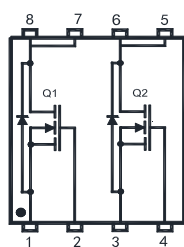


Dual N-Channel Enhancement Mode MOSFET

Features

- Surface-mounted package
- Low Gate-Source Threshold Voltage
- Halogen and Antimony Free(HAF), RoHS compliant



Q1:1.Source 2.Gate 7.Drain 8.Drain
Q2:3.Source 4.Gate 5.Drain 6.Drain
DFN3030 Plastic Package

Key Parameters (Q1/Q2)

Parameter	Value	Unit
BV _{DSS}	100	V
R _{DS(ON)} Max	335 @ V _{GS} = 10 V	mΩ
	345 @ V _{GS} = 4.5 V	
V _{GS(th)} typ	1.8	V
Q _g typ	8.1 @ V _{GS} = 10 V	nC

Absolute Maximum Ratings (at T_a = 25°C unless otherwise specified) (Q1/Q2)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V _{DS}	100	V
Gate-Source Voltage	V _{GS}	± 20	V
Drain Current	I _D	3.1	A
		1.9	
Peak Drain Current, Pulsed ¹⁾	I _{DM}	9	A
Single-Pulse Avalanche Current	I _{AS}	1.4	A
Single-Pulse Avalanche Energy ²⁾	E _{AS}	0.5	mJ
Power Dissipation	P _D	7.9	W
Operating Junction and Storage Temperature Range	T _J , T _{stg}	- 55 to + 150	°C

Thermal Characteristics(Q1/Q2)

Parameter	Symbol	Max.	Unit
Thermal Resistance from Junction to Case	R _{θJC}	15.7	°C/W
Thermal Resistance from Junction to Ambient ³⁾	R _{θJA}	80	°C/W

¹⁾ Pulse Test: Pulse Width ≤ 100 μs, Duty Cycle ≤ 2%, Repetitive rating, pulse width limited by junction temperature T_{J(MAX)} = 150°C.

²⁾ Limited by T_{J(MAX)}, starting T_J = 25 °C, L = 0.5 mH, R_g = 25 Ω, I_{AS} = 1.4 A, V_{GS} = 10 V.

³⁾ Device mounted on FR-4 substrate PC board, 2oz copper, with 1-inch square copper plate in still air.

Characteristics at $T_a = 25^\circ\text{C}$ unless otherwise specified (Q1/Q2)

Parameter	Symbol	Min.	Typ.	Max.	Unit
STATIC PARAMETERS					
Drain-Source Breakdown Voltage at $I_D = 250\ \mu\text{A}$	BV_{DSS}	100	-	-	V
Drain-Source Leakage Current at $V_{DS} = 100\ \text{V}$	I_{DSS}	-	-	1	μA
Gate Leakage Current at $V_{GS} = \pm 20\ \text{V}$	I_{GSS}	-	-	± 100	nA
Gate-Source Threshold Voltage at $V_{DS} = V_{GS}$, $I_D = 250\ \mu\text{A}$	$V_{GS(th)}$	1.2	-	2.5	V
Drain-Source On-State Resistance at $V_{GS} = 10\ \text{V}$, $I_D = 5\ \text{A}$ at $V_{GS} = 4.5\ \text{V}$, $I_D = 4\ \text{A}$	$R_{DS(on)}$	- -	300 -	335 345	m Ω
DYNAMIC PARAMETERS					
Forward Transconductance at $V_{DS} = 5\ \text{V}$, $I_D = 4\ \text{A}$	g_{fs}	-	5.2	-	S
Gate Resistance at $V_{DS} = 0\ \text{V}$, $V_{GS} = 0\ \text{V}$, $f = 1\ \text{MHz}$	R_g	-	1	-	Ω
Input Capacitance at $V_{DS} = 50\ \text{V}$, $V_{GS} = 0\ \text{V}$, $f = 1\ \text{MHz}$	C_{iss}	-	443	-	pF
Output Capacitance at $V_{DS} = 50\ \text{V}$, $V_{GS} = 0\ \text{V}$, $f = 1\ \text{MHz}$	C_{oss}	-	15	-	pF
Reverse Transfer Capacitance at $V_{DS} = 50\ \text{V}$, $V_{GS} = 0\ \text{V}$, $f = 1\ \text{MHz}$	C_{rss}	-	12	-	pF
Gate Charge Total at $V_{DS} = 50\ \text{V}$, $V_{GS} = 10\ \text{V}$, $I_D = 5\ \text{A}$ at $V_{DS} = 50\ \text{V}$, $V_{GS} = 4.5\ \text{V}$, $I_D = 5\ \text{A}$	Q_g	- -	8.1 3.7	- -	nC
Gate to Source Charge at $V_{DS} = 50\ \text{V}$, $V_{GS} = 10\ \text{V}$, $I_D = 5\ \text{A}$	Q_{gs}	-	2	-	nC
Gate to Drain Charge at $V_{DS} = 50\ \text{V}$, $V_{GS} = 10\ \text{V}$, $I_D = 5\ \text{A}$	Q_{gd}	-	1.1	-	nC
Turn-On Delay Time at $V_{DS} = 50\ \text{V}$, $V_{GS} = 10\ \text{V}$, $I_D = 5\ \text{A}$, $R_g = 3.3\ \Omega$	$t_{d(on)}$	-	7	-	ns
Turn-On Rise Time at $V_{DS} = 50\ \text{V}$, $V_{GS} = 10\ \text{V}$, $I_D = 5\ \text{A}$, $R_g = 3.3\ \Omega$	t_r	-	2	-	ns
Turn-Off Delay Time at $V_{DS} = 50\ \text{V}$, $V_{GS} = 10\ \text{V}$, $I_D = 5\ \text{A}$, $R_g = 3.3\ \Omega$	$t_{d(off)}$	-	6	-	ns
Turn-Off Fall Time at $V_{DS} = 50\ \text{V}$, $V_{GS} = 10\ \text{V}$, $I_D = 5\ \text{A}$, $R_g = 3.3\ \Omega$	t_f	-	3.5	-	ns
Body-Diode PARAMETERS					
Drain-Source Diode Forward Voltage at $I_S = 1\ \text{A}$, $V_{GS} = 0\ \text{V}$	V_{SD}	-	-	1.2	V
Body-Diode Continuous Current	I_S	-	-	3.1	A
Body-Diode Continuous Current, Pulsed	I_{SM}	-	-	9	A
Body Diode Reverse Recovery Time at $I_S = 5\ \text{A}$, $di/dt = 100\ \text{A}/\mu\text{s}$	t_{rr}	-	17	-	ns
Body Diode Reverse Recovery Charge at $I_S = 5\ \text{A}$, $di/dt = 100\ \text{A}/\mu\text{s}$	Q_{rr}	-	15	-	nC

Electrical Characteristics Curves (Q1/Q2)

Fig. 1 Typical Output Characteristics

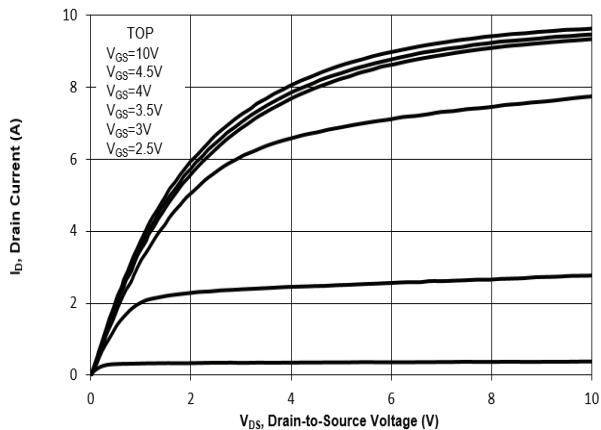


Fig. 2 Typical Transfer Characteristics

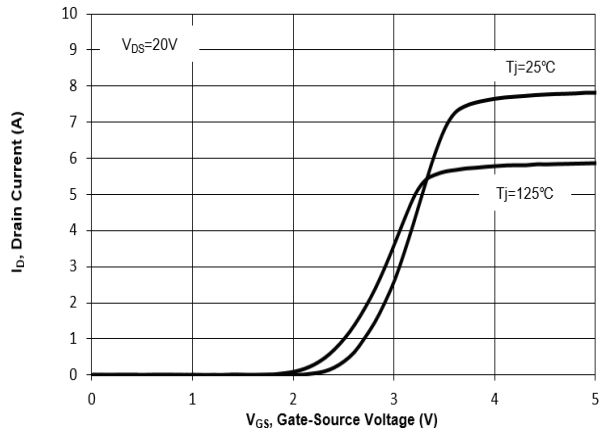


Fig. 3 on-Resistance vs. Drain Current

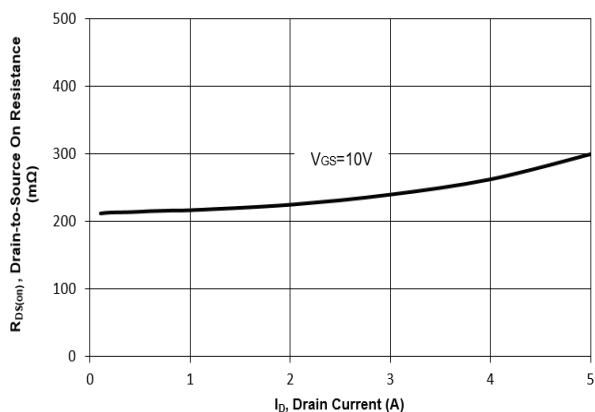


Fig. 4 on-Resistance vs. Gate to Source Voltage

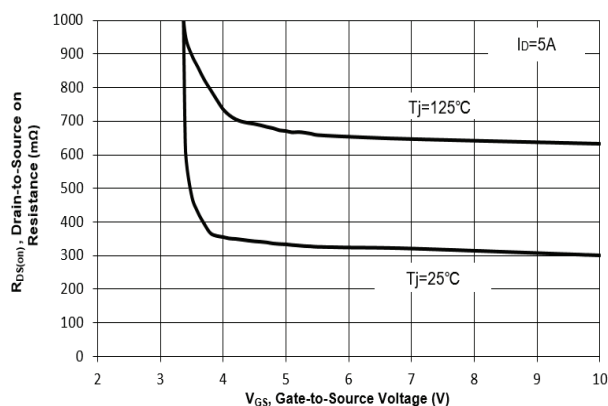


Fig. 5 on-Resistance vs. TJ

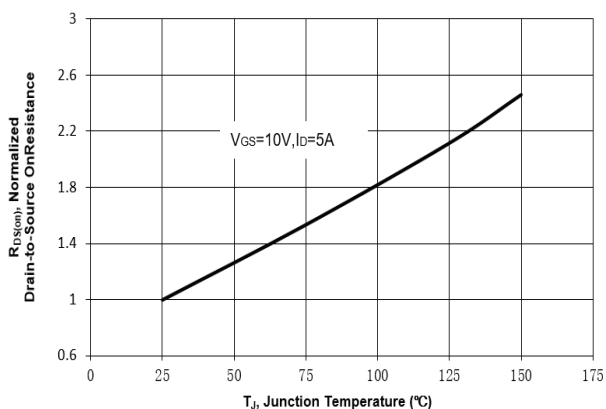
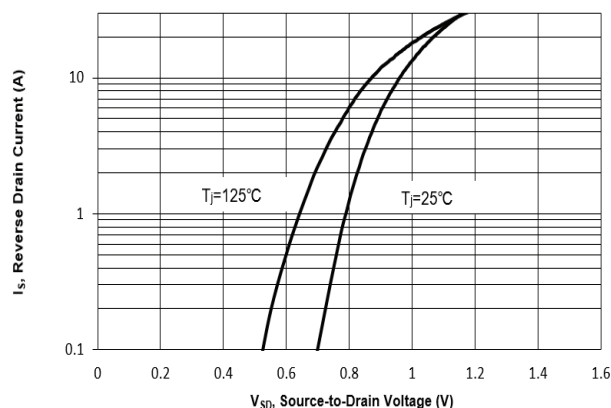


Fig. 6 Typical Body-Diode Forward Characteristics



Electrical Characteristics Curves (Q1/Q2)

Fig. 7 Typical Junction Capacitance

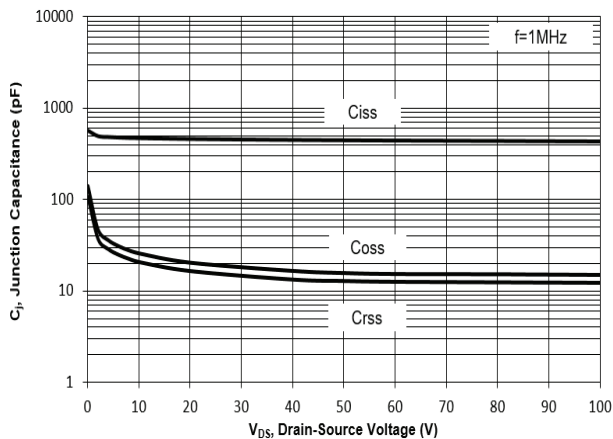


Fig. 8 Drain-Source Leakage Current vs. T_J

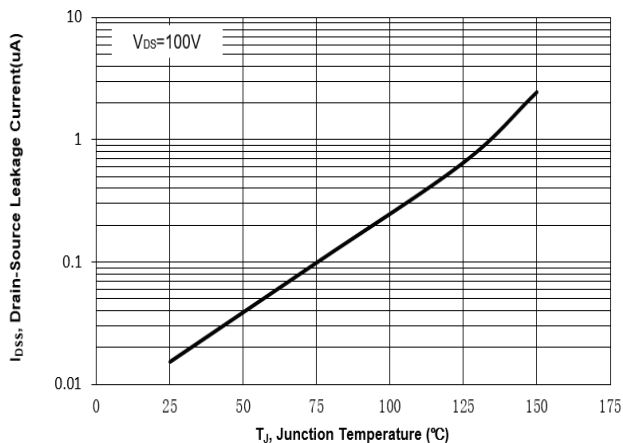


Fig. 9 V_{(BR)DSS} vs. Junction Temperature

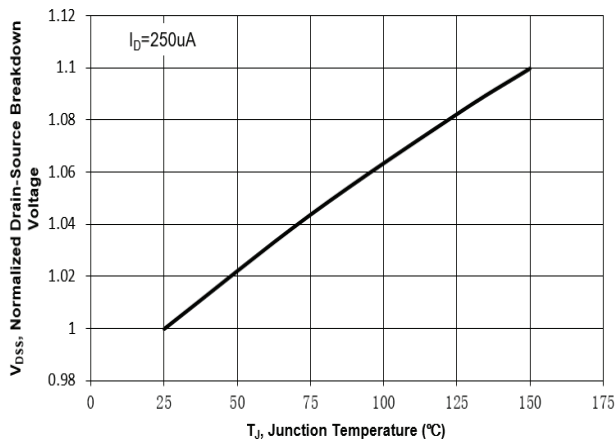


Fig. 10 Gate Threshold Variation vs. T_J

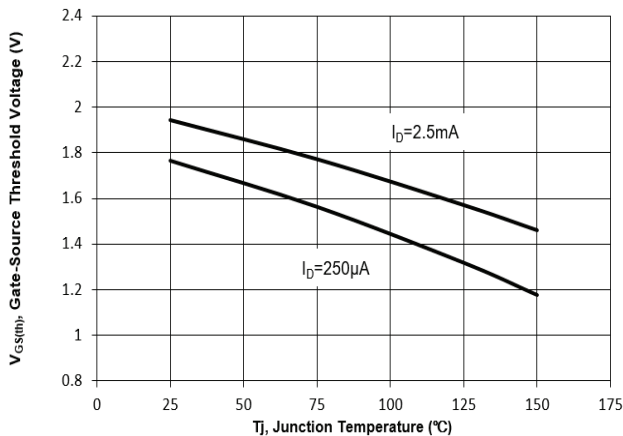


Fig. 11 Gate Charge

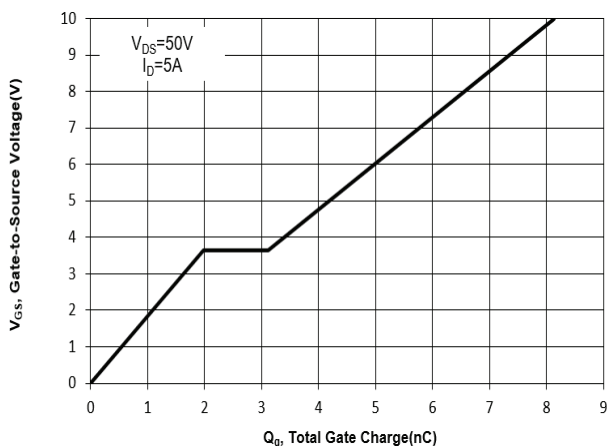


Fig. 12 Safe Operation Area

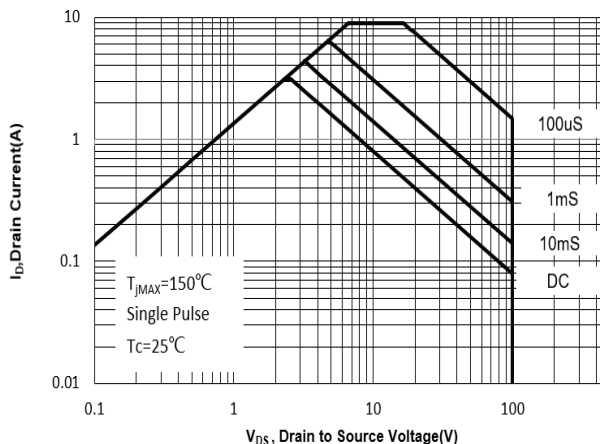


Fig. 13 Normalized Maximum Transient Thermal Impedance($Z_{\theta JC}$)

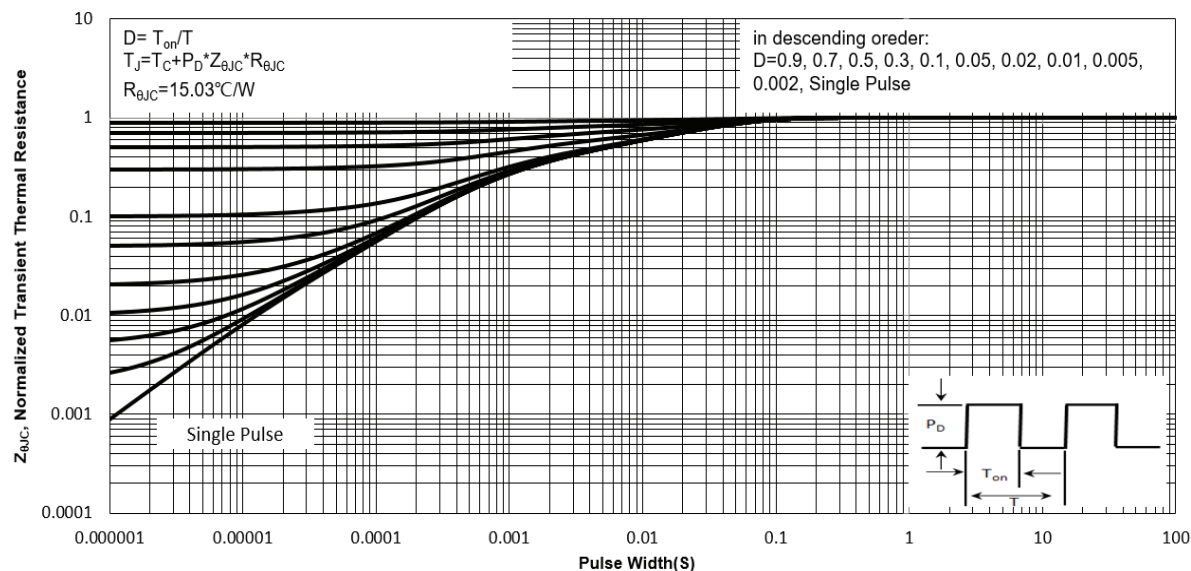
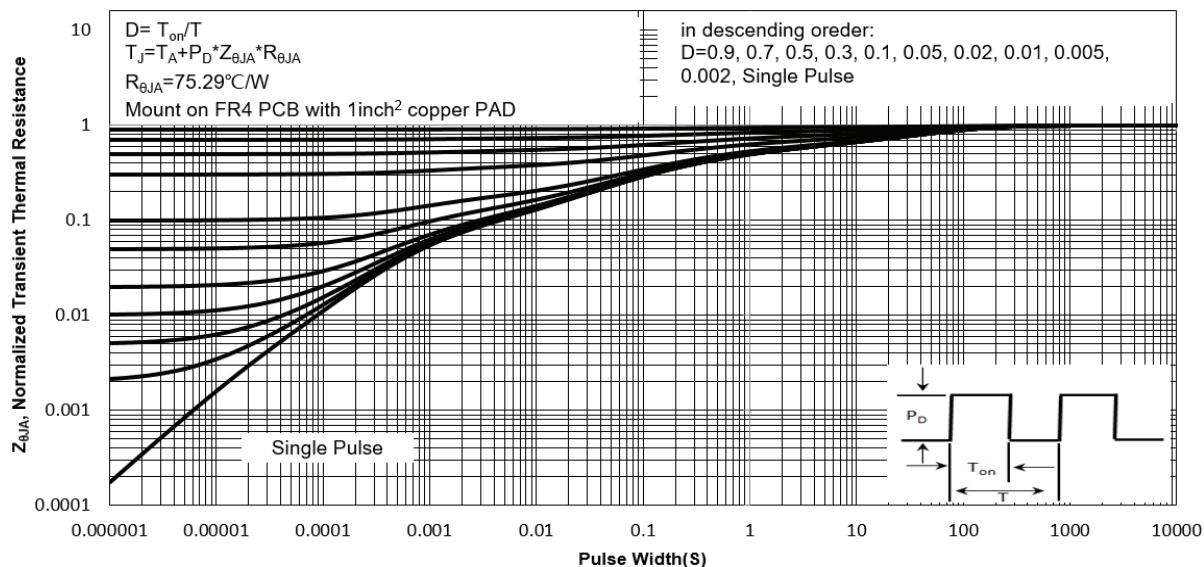


Fig. 14 Normalized Maximum Transient Thermal Impedance($Z_{\theta JA}$)



Test Circuits (Q1/Q2)

Fig.1-1 Switching times test circuit

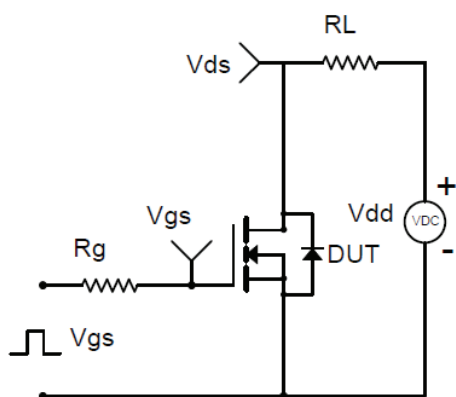


Fig.1-2 Switching Waveform

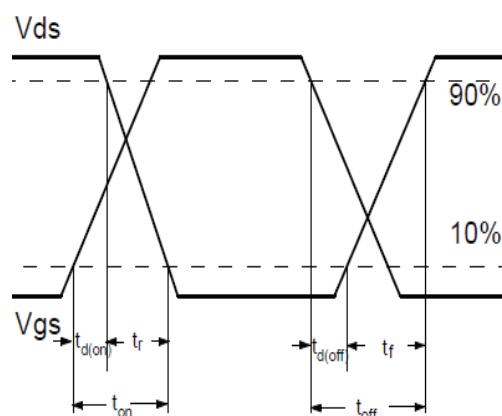


Fig.2-1 Gate charge test circuit

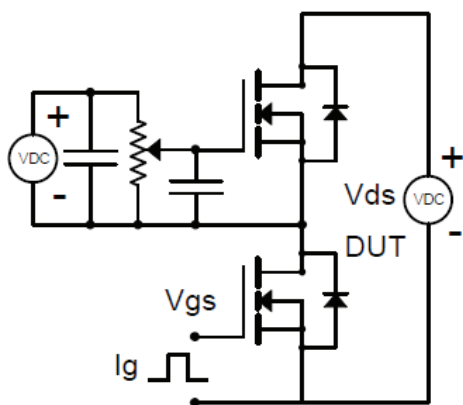


Fig.2-2 Gate charge waveform

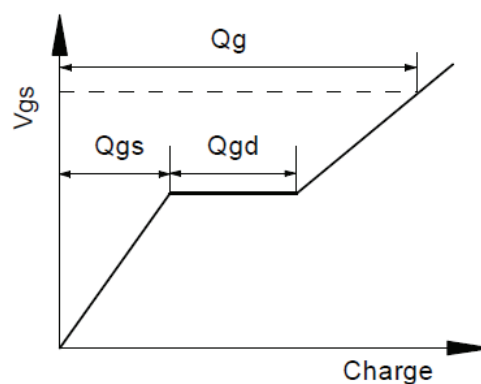


Fig.3-1 Avalanche test circuit

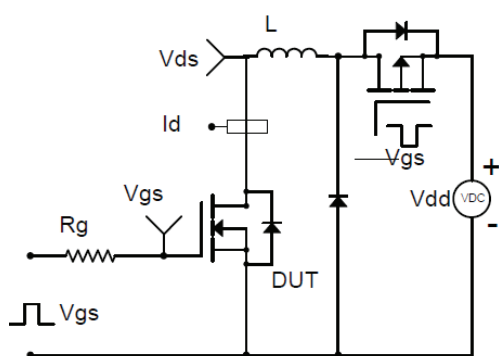
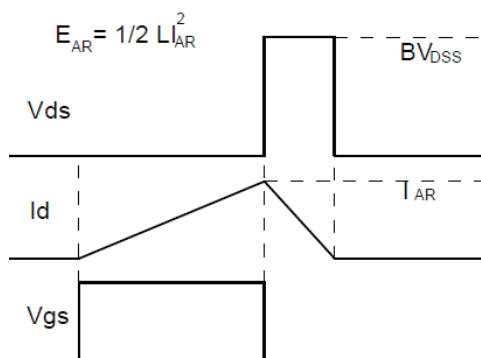
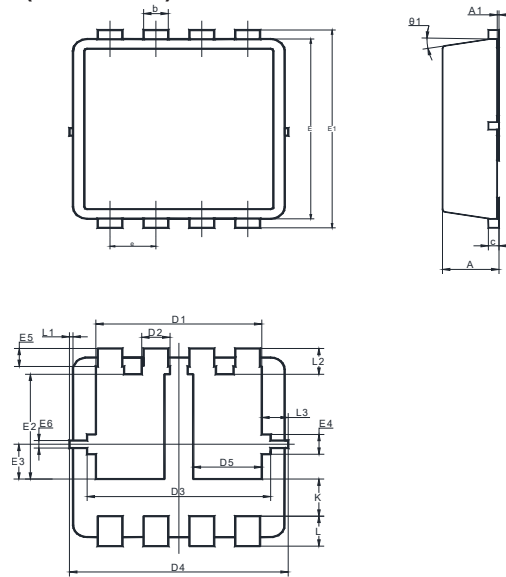


Fig.3-2 Avalanche waveform



Package Outline Dimensions (Units: mm)

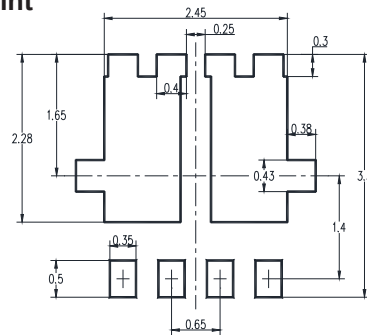
DFN3030



UNIT	A	A1	b	c	D1	D2	D3	D4	D5	E	E1	E2	E3
mm	0.9	0.05	0.35	0.25	2.6	0.5	2.7	3.2	1.135	3.1	3.3	1.85	0.68
	0.7	0	0.24	0.1	2.4	0.3	2.5	3	0.935	2.9	3.1	1.65	0.48

UNIT	E4	E5	E6	e	K	L	L1	L2	L3	θ1
mm	0.43	0.4	0.25	0.7	0.72	0.5	0.1	0.53	0.475	12°
	0.23	0.2	0.15	0.6	0.52	0.3	0	0.33	0.275	0°

Recommended Soldering Footprint



Packing information

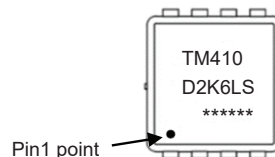
Package	Tape Width (mm)	Pitch		Reel Size		Per Reel Packing Quantity
		mm	inch	mm	inch	
DFN3030	12	8 ± 0.1	0.315 ± 0.004	330	13	5,000

Marking information

" TM410D2K6LS " = Part No.

" ***** " = Date Code Marking

Font type: Arial



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