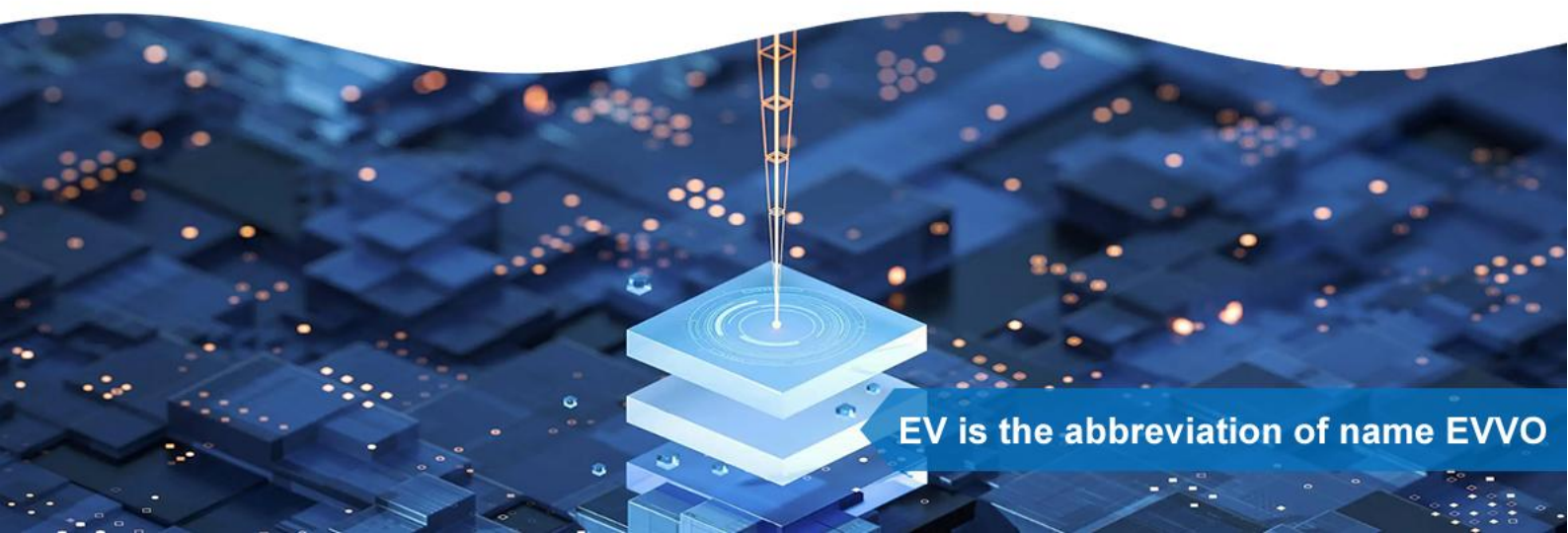
EVVOSEMI®

THINK CHANGE DO

ESD TVS MOS LDO Diode Sensor DC-DC

Product Specification

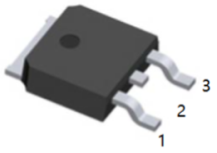
Domestic Part Number	FQD17P06TM
Overseas Part Number	FQD17P06TM
Equivalent Part Number	FQD17P06TM



-60V P-Channel MOSFET

Description

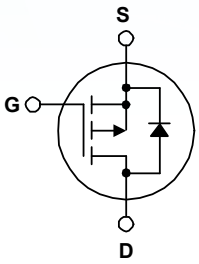
This advanced MOSFET technology has been es pecially tailored to reduce on-st ate resistance, and to provi de super ior sw itching performa nce and high avala nche energy strength. These device s are suitable for switched mode powe r supplies , audio ampl ifier, DC motor control, and variable switching power applications.



1.G 2.D 3.S
TO-252(DPAK) top view

Features

- V_{DS} (V) = -60V
- I_D = -12A (V_{GS} = -10V)
- $R_{DS(ON)}$ < 135mΩ (V_{GS} = -10V)



Absolute Maximum Ratings TC = 25°C unless otherwise noted.

Symbol	Parameter			FQD17P06 / FQU17P06	Unit
V_{DSS}	Drain-Source Voltage			-60	V
I_D	Drain Current	- Continuous (T_C = 25°C)		-12	A
		- Continuous (T_C = 100°C)		-7.6	A
I_{DM}	Drain Current	- Pulsed	(Note 1)	-48	A
V_{GSS}	Gate-Source Voltage			± 25	V
E_{AS}	Single Pulsed Avalanche Energy		(Note 2)	300	mJ
I_{AR}	Avalanche Current		(Note 1)	-12	A
E_{AR}	Repetitive Avalanche Energy		(Note 1)	4.4	mJ
dv/dt	Peak Diode Recovery dv/dt		(Note 3)	-7.0	V/ns
P_D	Power Dissipation (T_A = 25°C) *			2.5	W
	Power Dissipation (T_C = 25°C)			44	W
		- Derate above 25°C		0.35	W/°C
T_J, T_{STG}	Operating and Storage Temperature Range			-55 to +150	°C
T_L	Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds.			300	°C

Thermal Characteristics

Symbol	Parameter	FQD17P06	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case, Max.	2.85	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient (Minimum Pad of 2-oz Copper), Max.	110	
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient (*1 in^2 Pad of 2-oz Copper), Max.	50	

* When mounted on the minimum pad size recommended (PCB Mount)

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Electrical Characteristics T_C = 25°C unless otherwise noted.

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0 V, I_D = -250 μA	-60			V
ΔBV_{DSS} / ΔT_J	Breakdown Voltage Temperature Coefficient	I_D = -250 μA, Referenced to 25°C		-0.06		V/°C
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = -60 V, V_{GS} = 0 V			-1	μA
		V_{DS} = -48 V, T_C = 125°C			-10	μA
I_{GSSF}	Gate-Body Leakage Current, Forward	V_{GS} = -25 V, V_{DS} = 0 V			-100	nA
I_{GSSR}	Gate-Body Leakage Current, Reverse	V_{GS} = 25 V, V_{DS} = 0 V			100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = -250 μA	-1.1	-2	-3.0	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	V_{GS} = -10 V, I_D = -6.0 A		110	135	mΩ
g_{FS}	Forward Transconductance	V_{DS} = -30 V, I_D = -6.0 A		8.7		S
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS} = -25 V, V_{GS} = 0 V, f = 1.0 MHz		690	900	pF
C_{oss}	Output Capacitance			325	420	pF
C_{rss}	Reverse Transfer Capacitance			80	105	pF
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	V_{DD} = -30 V, I_D = -8.5 A, R_G = 25 Ω (Note 4)		13	35	ns
t_r	Turn-On Rise Time			100	210	ns
$t_{d(off)}$	Turn-Off Delay Time			22	55	ns
t_f	Turn-Off Fall Time			60	130	ns
Q_g	Total Gate Charge	V_{DS} = -48 V, I_D = -17 A, V_{GS} = -10 V (Note 4)		21	27	nC
Q_{gs}	Gate-Source Charge			4.2		nC
Q_{gd}	Gate-Drain Charge			10		nC
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain-Source Diode Forward Current				-12	A
I_{SM}	Maximum Pulsed Drain-Source Diode Forward Current				-48	A
V_{SD}	Drain-Source Diode Forward Voltage	V_{GS} = 0 V, I_S = -12 A			-4.0	V
t_{rr}	Reverse Recovery Time	V_{GS} = 0 V, I_S = -17 A, dI_F / dt = 100 A/μs		92		ns
Q_{rr}	Reverse Recovery Charge			0.32		μC

NOTES:

1. Repetitive rating: pulse-width limited by maximum junction temperature.
2. L = 2.4 mH, I_{AS} = -12 A, V_{DD} = -25 V, R_G = 25 Ω, starting T_J = 25°C.
3. I_{SD} ≤ -17 A, di/dt ≤ 300 A/μs, V_{DD} ≤ BV_{DSS}, starting T_J = 25°C.
4. Essentially independent of operating temperature typical characteristics.

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Typical Performance Characteristics

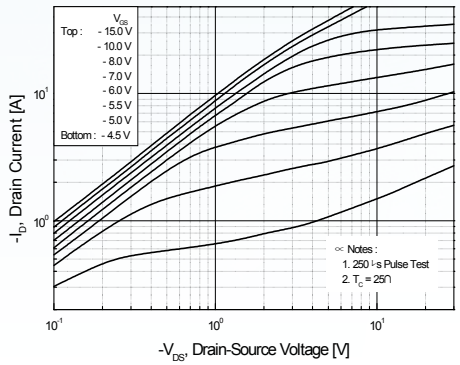

Figure 1. On-Region Characteristics

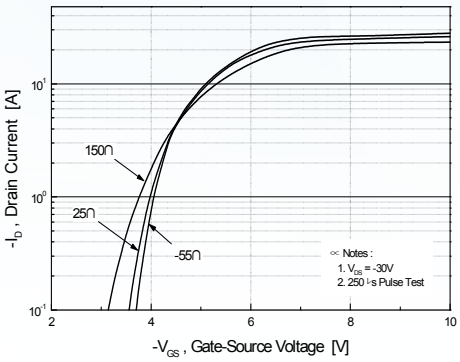

Figure 2. Transfer Characteristics

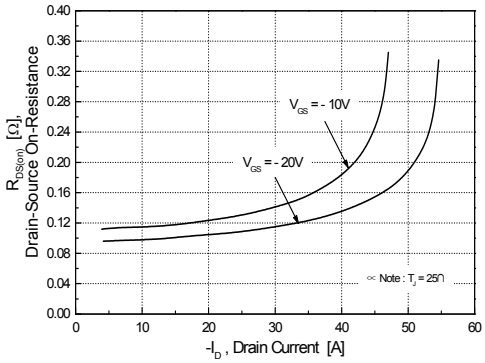

Figure 3. On-Resistance Variation vs. Drain Current and Gate Voltage

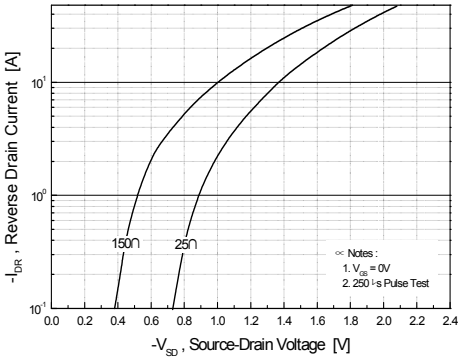

Figure 4. Body Diode Forward Voltage Variation vs. Source Current and Temperature

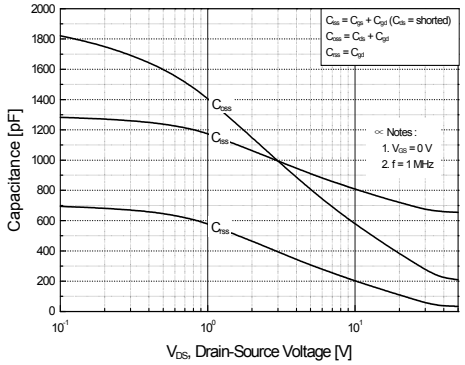

Figure 5. Capacitance Characteristics

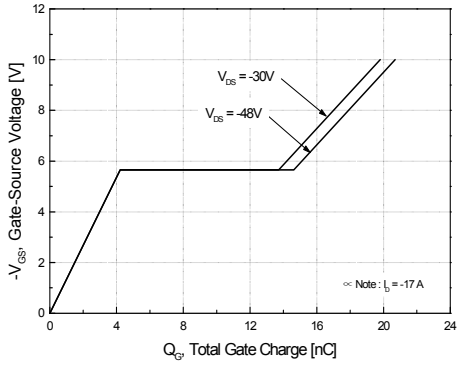

Figure 6. Gate Charge Characteristics

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Typical Performance Characteristics

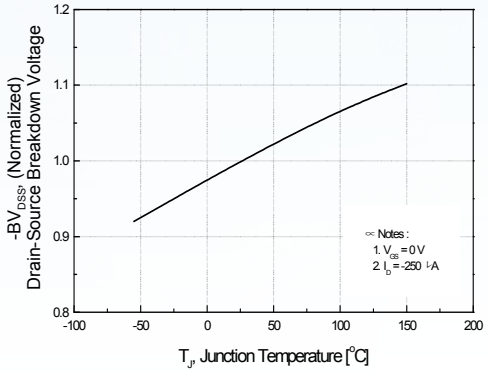

Figure 7. Breakdown Voltage Variation vs. Temperature

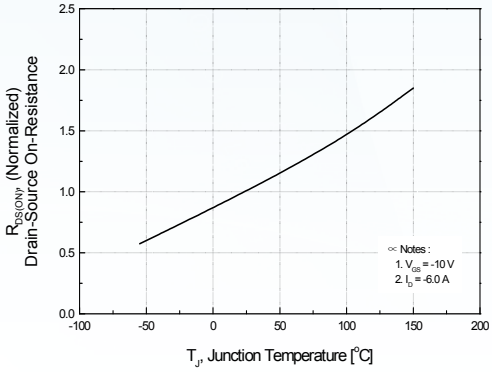

Figure 8. On-Resistance Variation vs. Temperature

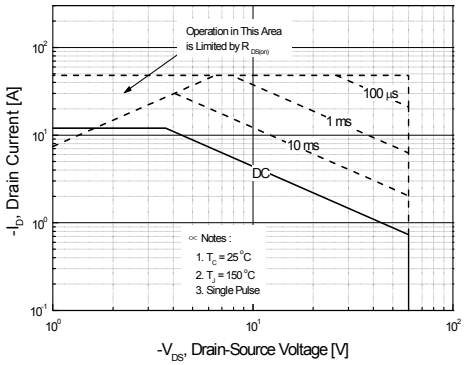

Figure 9. Maximum Safe Operating Area

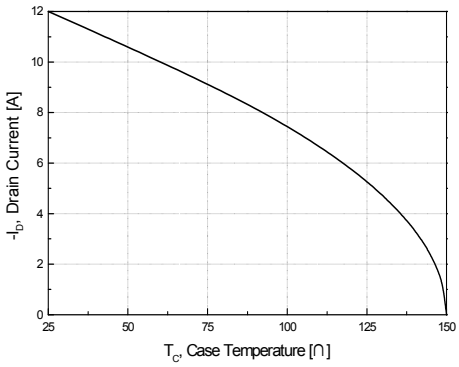

Figure 10. Maximum Drain Current vs. Case Temperature

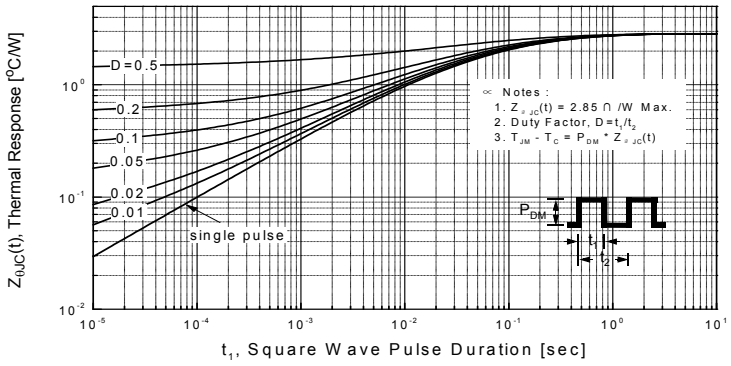

Figure 11. Transient Thermal Response Curve

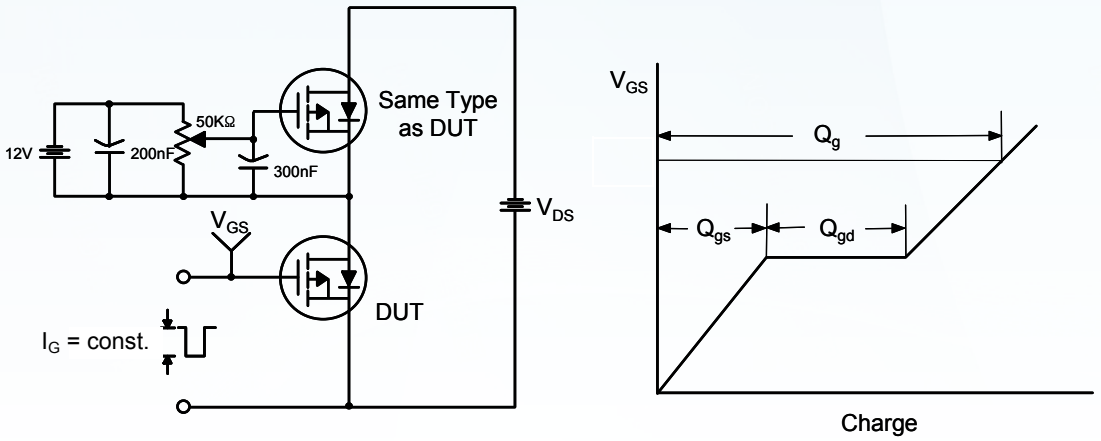

Figure 12. Gate Charge Test Circuit & Waveform

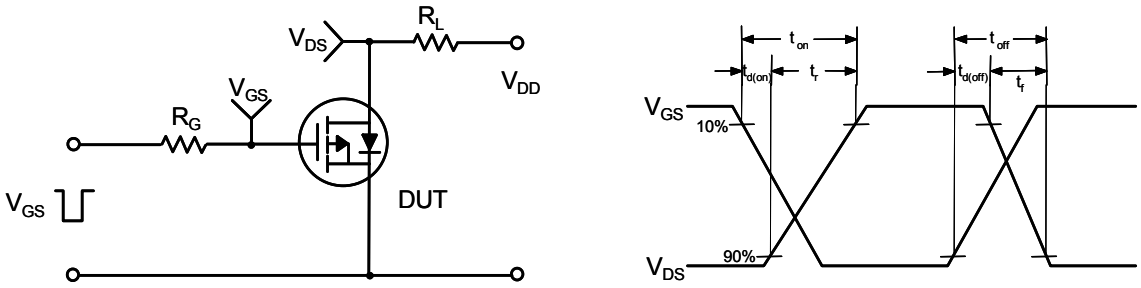

Figure 13. Resistive Switching Test Circuit & Waveforms

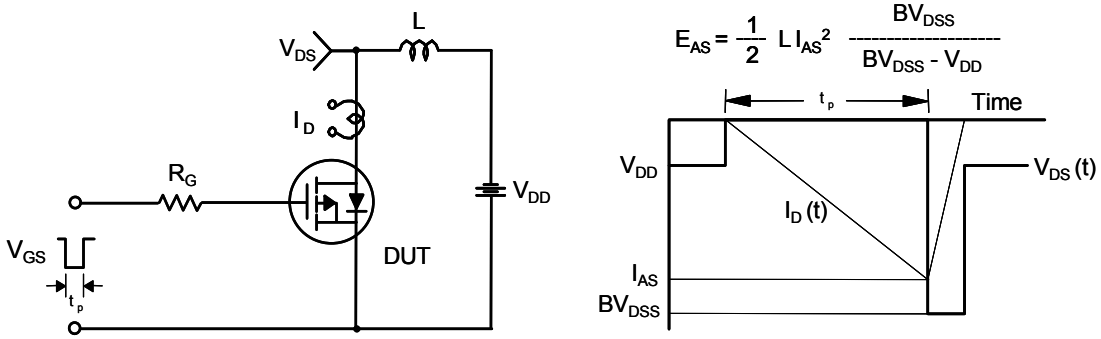

Figure 14. Unclamped Inductive Switching Test Circuit & Waveforms

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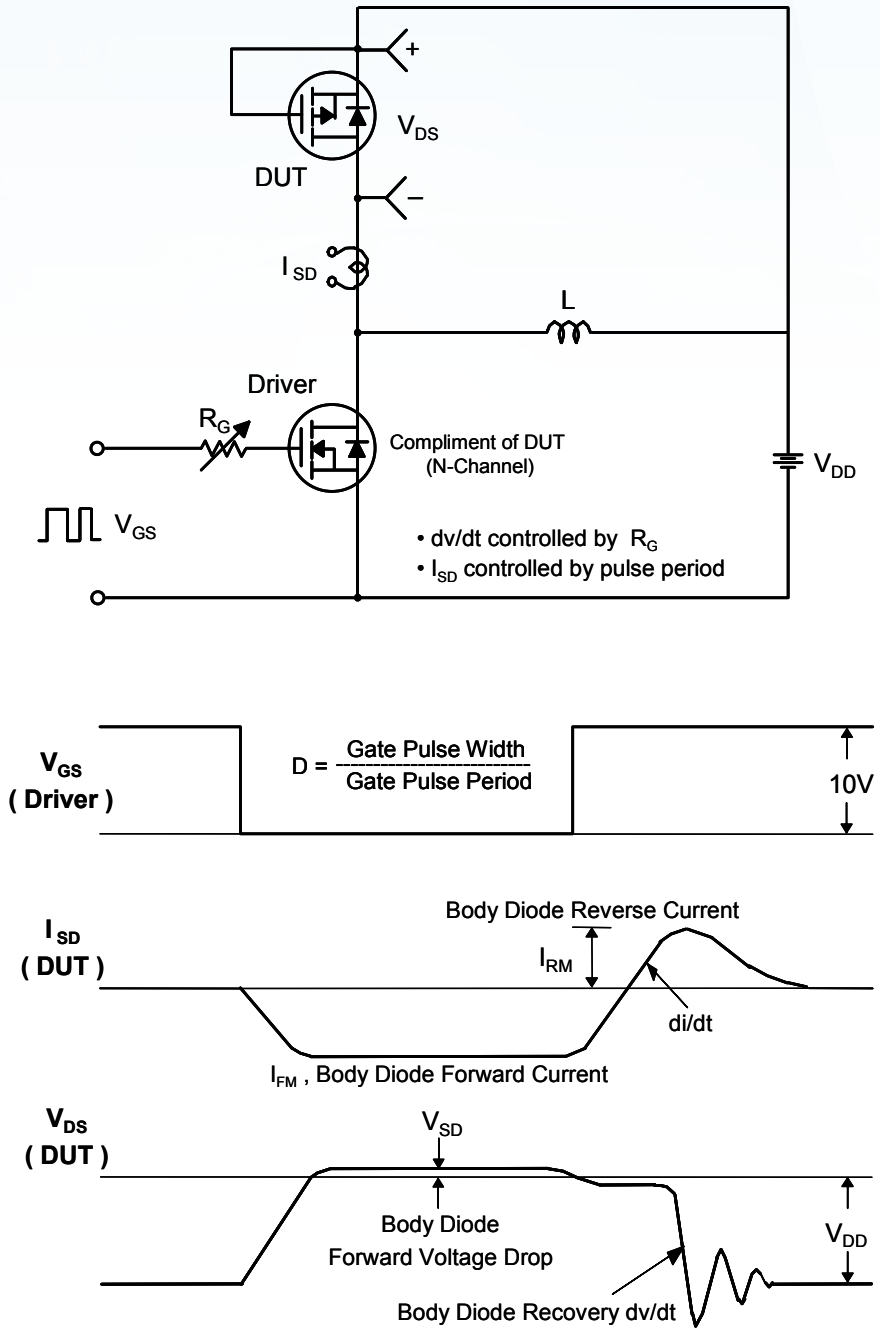

Figure 15. Peak Diode Recovery dv/dt Test Circuit & Waveforms

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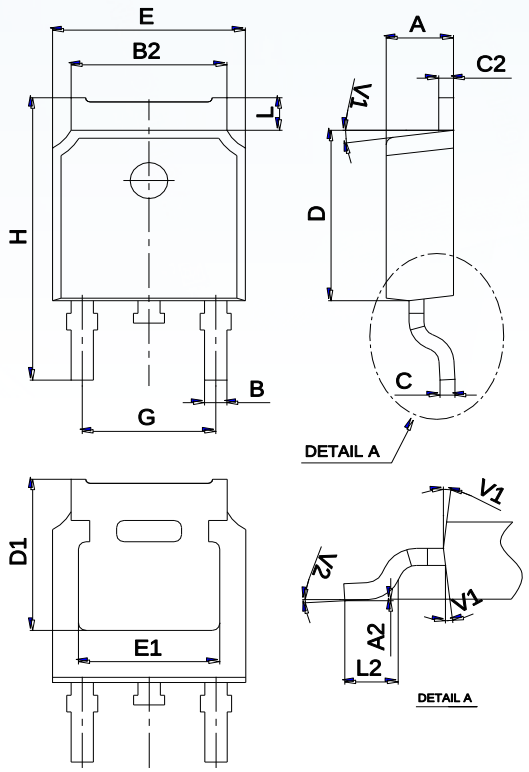
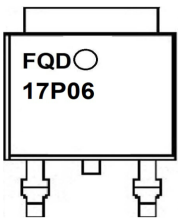
Package Mechanical Data TO-252



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°

Marking



Ordering information

Order code	Package	Baseqty	Deliverymode
FQD17P06TM	TO-252	2500	Tape and reel

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