

EVVOSEMI[®]

THINK CHANGE DO



ESD



TVS



MOS



LDO



Diode



Sensor



DC-DC

Product Specification

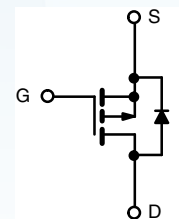
▶ Domestic	Part Number	FDS6681Z
▶ Overseas	Part Number	FDS6681Z
▶ Equivalent	Part Number	FDS6681Z

EV is the abbreviation of name EVVO

P-Channel 30 V (D-S) MOSFET

PRODUCT SUMMARY

V_{DS} (V)	-30
$R_{DS(on)}$ max. (m Ω) at $V_{GS} = 10$ V	5
$R_{DS(on)}$ max. (m Ω) at $V_{GS} = 4.5$ V	8
Q_g typ. (nC)	27
I_D (A)	18
Configuration	Single

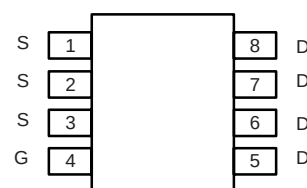


P-Channel MOSFET

APPLICATIONS

- Battery management in mobile devices
- Adapter and charger switch
- Battery switch
- Load switch

SOP-8



Top View

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)	$T_C = 25$ °C	I_D	-18	A
	$T_C = 70$ °C		-13	
	$T_A = 25$ °C		-11	
	$T_A = 70$ °C		-8	
Pulsed drain current ($t = 100$ μ s)		I_{DM}	-145	
Continuous source-drain diode current	$T_C = 25$ °C	I_S	-5	
	$T_A = 25$ °C		-2.8 ^{b, c}	
Single pulse avalanche current	$L = 0.1$ mH	I_{AS}	-25	mJ
Single pulse avalanche energy		E_{AS}	31.2	
Maximum power dissipation	$T_C = 25$ °C	I_P	5.6	W
	$T_C = 70$ °C		3.6	
	$T_A = 25$ °C		3.1 ^{b, c}	
	$T_A = 70$ °C		2 ^{b, c}	
Operating junction and storage temperature range		T_J, T_{stg}	-55 to +150	°C
Soldering recommendations (peak temperature) ^c			260	

THERMAL RESISTANCE RATINGS

PARAMETER		SYMBOL	TYPICAL	MAXIMUM	UNIT
Maximum junction-to-ambient ^b	$t \leq 10$ s	R_{thJA}	34	40	°C/W
Maximum junction-to-case (drain)	Steady state	R_{thJF}	18	22	

Notes

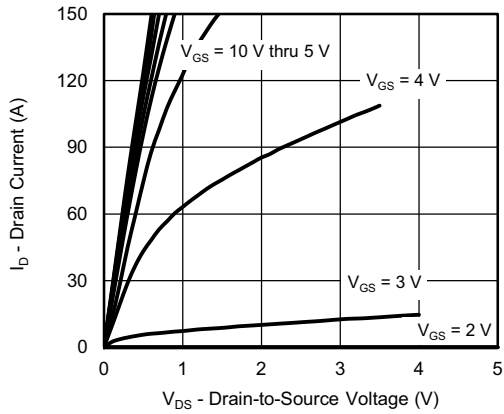
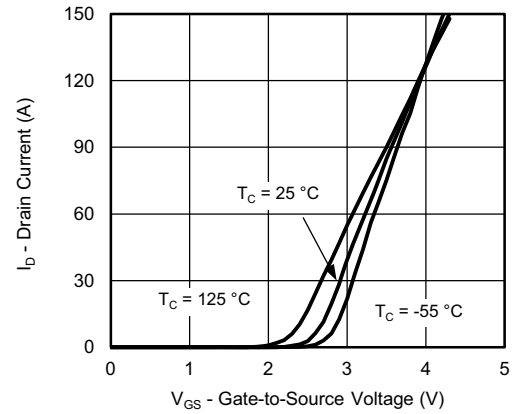
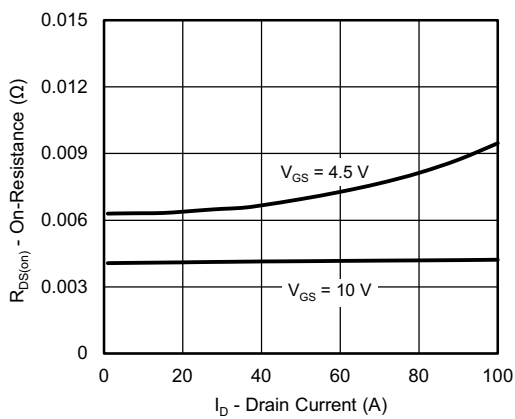
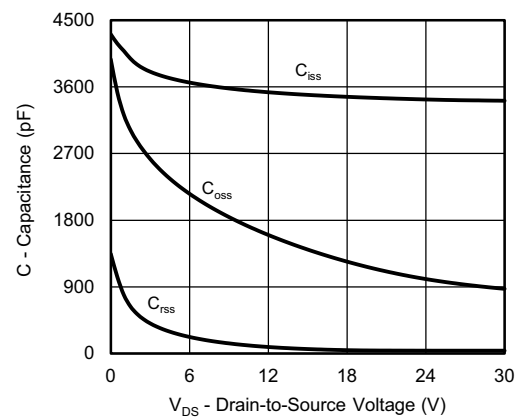
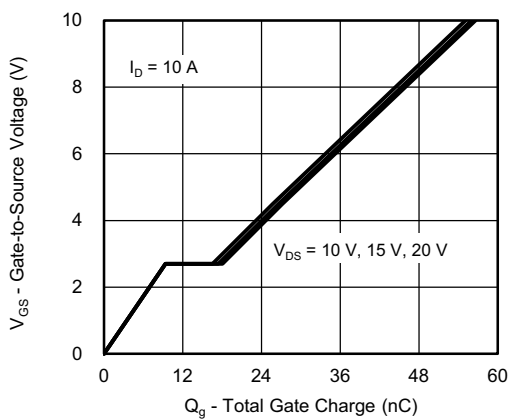
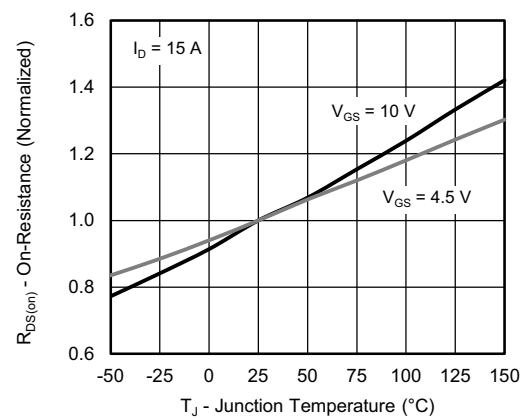
- Package limited
- Surface mounted on 1" x 1" FR4 board
- $t = 10$ s
- The SOP-8 is a leadless package. The end of the lead terminal is exposed copper (not plated) as a result of the singulation process in manufacturing. A solder fillet at the exposed copper tip cannot be guaranteed and is not required to ensure adequate bottom side solder interconnection
- Rework conditions: manual soldering with a soldering iron is not recommended for leadless components
- Maximum under steady state conditions is 85 °C/W
- $T_C = 25$ °C

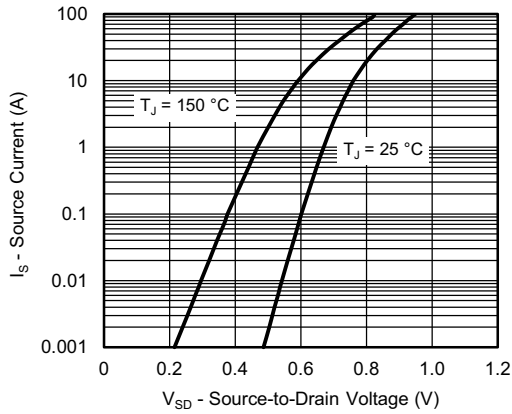
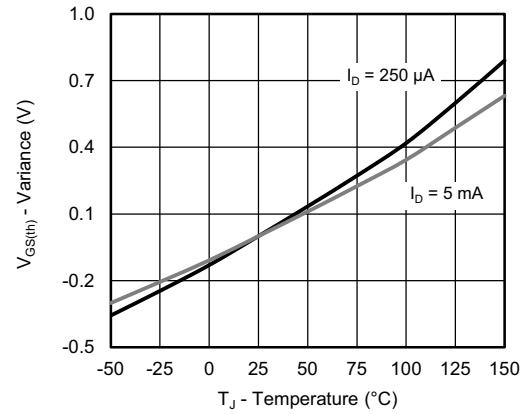
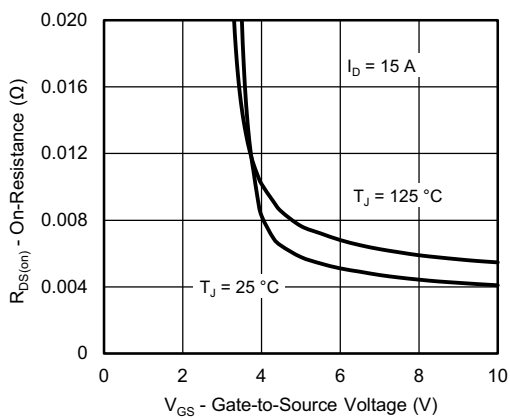
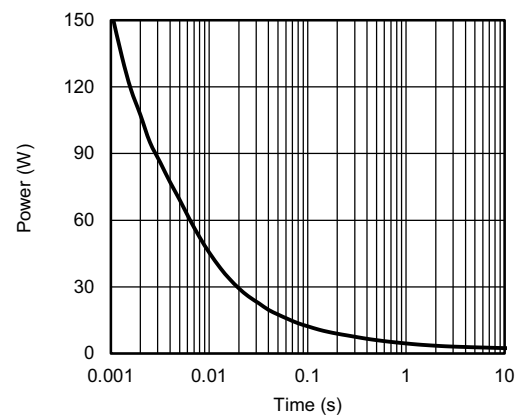
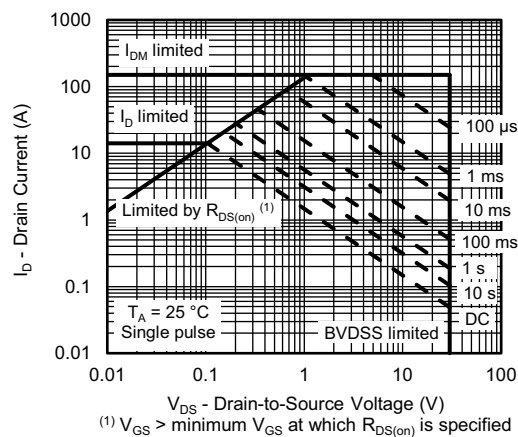
P-Channel 30 V (D-S) MOSFET
SPECIFICATIONS ($T_J = 25\text{ }^{\circ}\text{C}$, unless otherwise noted)

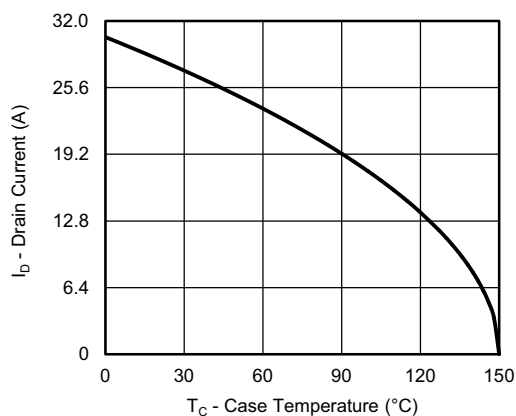
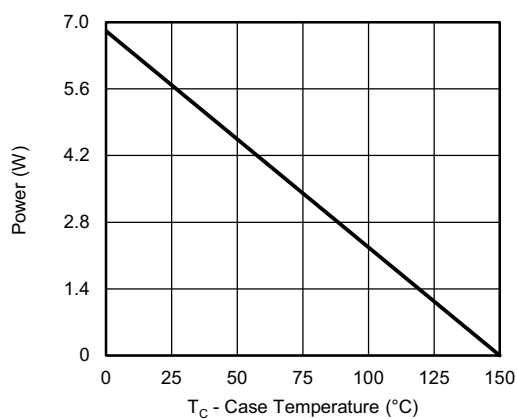
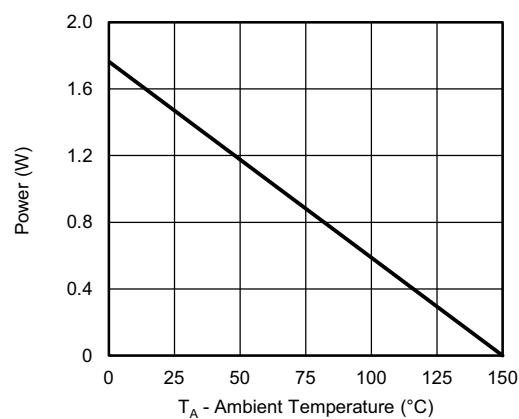
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Static						
Drain-source breakdown voltage	V _{DS}	V _{GS} = 0 V, I _D = -250 μA	-30	-	-	V
V _{DS} temperature coefficient	ΔV _{DS} /T _J	I _D = -10 mA	-	-17	-	mV/°C
V _{GS(th)} temperature coefficient	ΔV _{GS(th)} /T _J	I _D = -250 μA	-	5.5	-	
Gate-source threshold voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	-1	-	-2.2	V
Gate-source leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = +16 / -20 V	-	-	100	nA
Zero gate voltage drain current	I _{DSS}	V _{DS} = -30 V, V _{GS} = 0 V	-	-	-1	μA
		V _{DS} = -30 V, V _{GS} = 0 V, T _J = 70 °C	-	-	-15	
On-state drain current ^a	I _{D(on)}	V _{DS} ≥ -10 V, V _{GS} = -10 V	-40	-	-	A
Drain-source on-state resistance ^a	R _{DS(on)}	V _{GS} = -10 V, I _D = -15 A	-	5	-	mΩ
		V _{GS} = -4.5 V, I _D = -10 A	-	8	-	
Forward transconductance ^a	g _{fs}	V _{DS} = -15 V, I _D = -15 A	-	81	-	S
Dynamic ^b						
Input capacitance	C _{iss}	V _{DS} = -15 V, V _{GS} = 0 V, f = 1 MHz	-	3490	-	pF
Output capacitance	C _{oss}		-	1420	-	
Reverse transfer capacitance	C _{rss}		-	70	-	
Total gate charge	Q _g	V _{DS} = -15 V, V _{GS} = -10 V, I _D = -10 A	-	56	84	nC
		V _{DS} = -15 V, V _{GS} = -4.5 V, I _D = -10 A	-	27	41	
Gate-source charge	Q _{gs}		-	9.4	-	
Gate-drain charge	Q _{gd}		-	8.2	-	
Gate resistance	R _g	f = 1 MHz	1.5	3.5	6	Ω
Turn-on delay time	t _{d(on)}	V _{DD} = -15 V, R _L = 1.5 Ω, I _D ≅ -10 A, V _{GEN} = -10 V, R _g = 1 Ω	-	15	30	ns
Rise time	t _r		-	6	12	
Turn-off delay time	t _{d(off)}		-	39	78	
Fall time	t _f		-	10	20	
Turn-on delay time	t _{d(on)}	V _{DD} = -15 V, R _L = 1.5 Ω, I _D ≅ -10 A, V _{GEN} = -4.5 V, R _g = 1 Ω	-	34	68	
Rise time	t _r		-	86	172	
Turn-off delay time	t _{d(off)}		-	31	62	
Fall time	t _f		-	22	44	
Drain-Source Body Diode Characteristics						
Continuous source-drain diode current	I _S	T _C = 25 °C	-	-	-5	A
Pulse diode forward current	I _{SM}		-	-	-150	
Body diode voltage	V _{SD}	I _S = -5 A, V _{GS} = 0 V	-	-0.73	-1.1	V
Body diode reverse recovery time	t _{rr}	I _F = -10 A, di/dt = 100 A/μs, T _J = 25 °C	-	44	88	ns
Body diode reverse recovery charge	Q _{rr}		-	41	82	nC
Reverse recovery fall time	t _a		-	19	-	ns
Reverse recovery rise time	t _b		-	25	-	

Notes

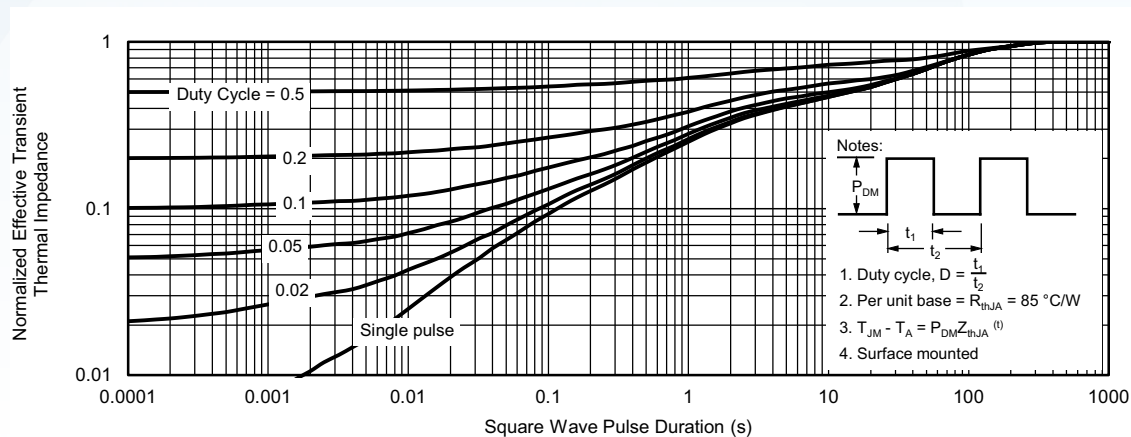
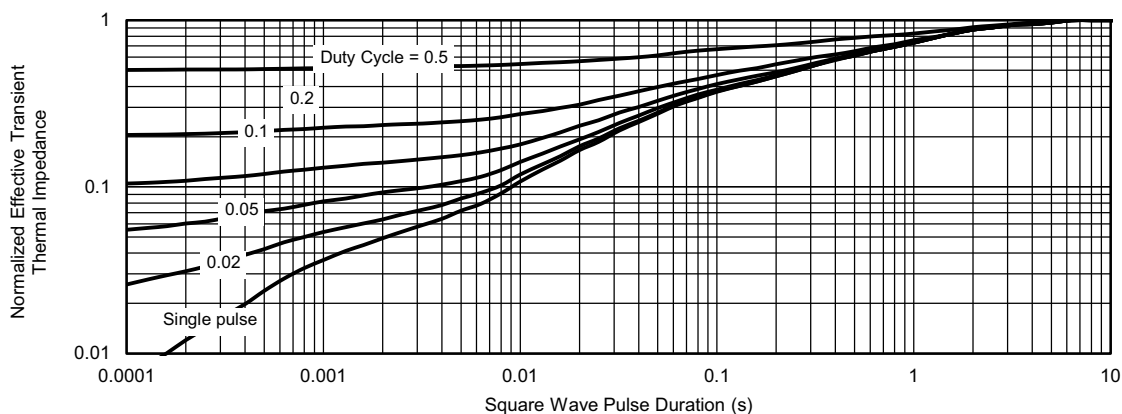
- a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$
 b. Guaranteed by design, not subject to production testing

P-Channel 30 V (D-S) MOSFET
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

Output Characteristics

Transfer Characteristics

On-Resistance vs. Drain Current and Gate Voltage

Capacitance

Gate Charge

On-Resistance vs. Junction Temperature

P-Channel 30 V (D-S) MOSFET
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

Source-Drain Diode Forward Voltage

Threshold Voltage

On-Resistance vs. Gate-to-Source Voltage

Single Pulse Power, Junction-to-Ambient

Safe Operating Area, Junction-to-Ambient

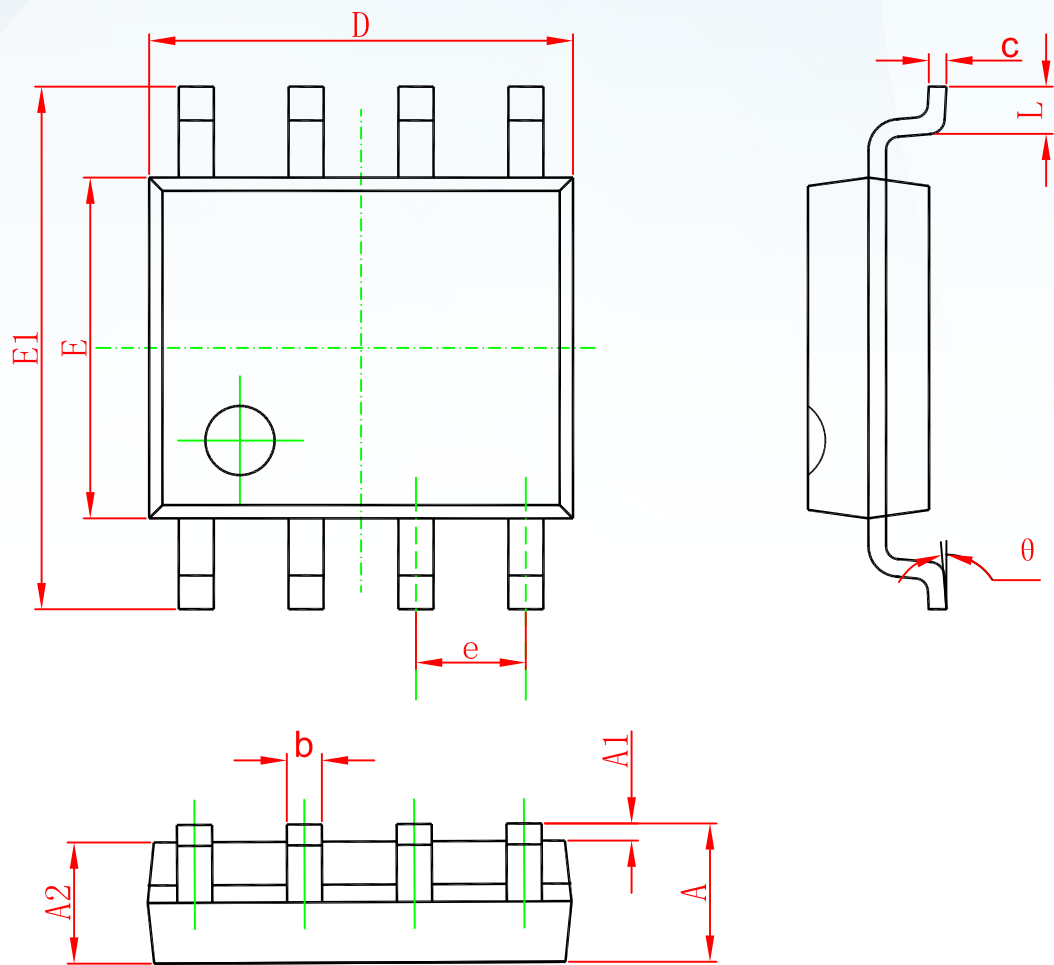
P-Channel 30 V (D-S) MOSFET
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

Current Derating ^a

Power, Junction-to-Case

Power, Junction-to-Ambient
Note

- a. The power dissipation P_D is based on T_J max. = 150 °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit

P-Channel 30 V (D-S) MOSFET
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

Normalized Thermal Transient Impedance, Junction-to-Ambient

Normalized Thermal Transient Impedance, Junction-to-Case

P-Channel 30 V (D-S) MOSFET

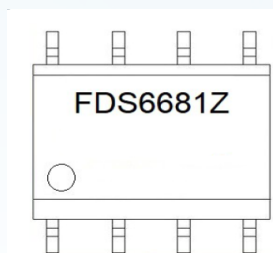
SOP-8



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

P-Channel 30 V (D-S) MOSFET

Marking



Ordering information

Order code	Package	Baseqty	Deliverymode
FDS6681Z	SOP-8	3000	Tape and reel

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