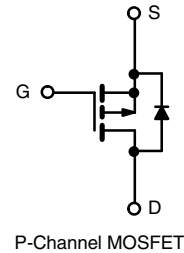


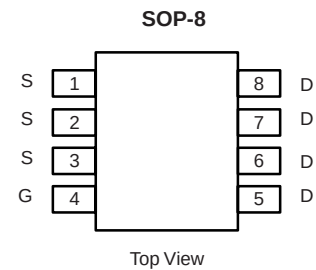
PRODUCT SUMMARY

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



APPLICATIONS

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



ABSOLUTE MAXIMUM RATINGS $(T_A = 25\text{ }^{\circ}\text{C}$, unless otherwise noted)

PARAMETER		SYMBOL	LIMIT	UNIT
Drain-source voltage		V_{DS}	-30	V
Gate-source voltage		V_{GS}	± 20	
Continuous drain current ($T_J = 150\text{ }^{\circ}\text{C}$)	$T_C = 25\text{ }^{\circ}\text{C}$	I_D	-18	A
	$T_C = 70\text{ }^{\circ}\text{C}$		-13	
	$T_A = 25\text{ }^{\circ}\text{C}$		-11	
	$T_A = 70\text{ }^{\circ}\text{C}$		-8	
Pulsed drain current ($t = 100\text{ }\mu\text{s}$)		I_{DM}	-145	
Continuous source-drain diode current	$T_C = 25\text{ }^{\circ}\text{C}$	I_S	-5	
	$T_A = 25\text{ }^{\circ}\text{C}$		-2.8 ^{b, c}	
Single pulse avalanche current	$L = 0.1\text{ mH}$	I_{AS}	-25	mJ
Single pulse avalanche energy		E_{AS}	31.2	
Maximum power dissipation	$T_C = 25\text{ }^{\circ}\text{C}$	I_P	5.6	W
	$T_C = 70\text{ }^{\circ}\text{C}$		3.6	
	$T_A = 25\text{ }^{\circ}\text{C}$		3.1 ^{b, c}	
	$T_A = 70\text{ }^{\circ}\text{C}$		2 ^{b, c}	
Operating junction and storage temperature range		T_J, T_{stg}	-55 to +150	$^{\circ}\text{C}$
Soldering recommendations (peak temperature) ^c			260	

THERMAL RESISTANCE RATINGS

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

Notes

- Package limited
- Surface mounted on 1" x 1" FR4 board
- $t = 10\text{ s}$
- 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 $^{\circ}\text{C/W}$
- $T_C = 25\text{ }^{\circ}\text{C}$

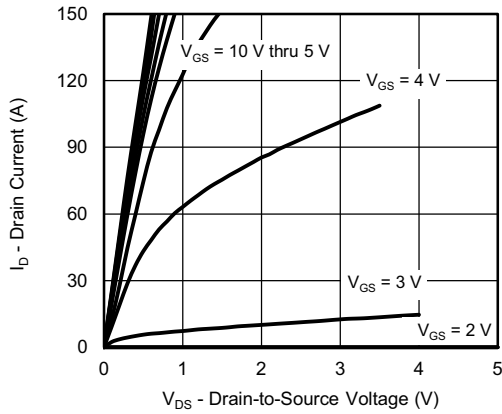
SPECIFICATIONS (T_J = 25 °C, unless otherwise noted)

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
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
			-	27	41	
Gate-source charge	Q _{gs}	V _{DS} = -15 V, V _{GS} = -4.5 V, I _D = -10 A	-	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	-	

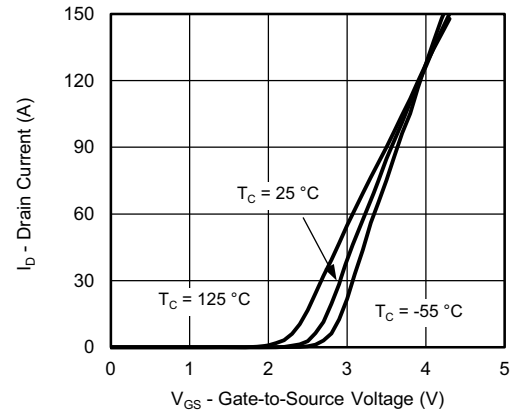
Notes

- Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2 %
- Guaranteed by design, not subject to production testing

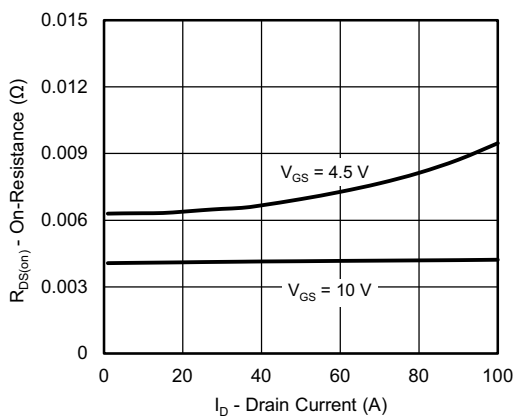
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



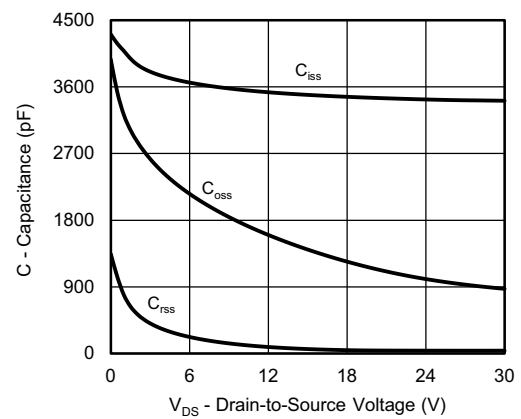
Output Characteristics



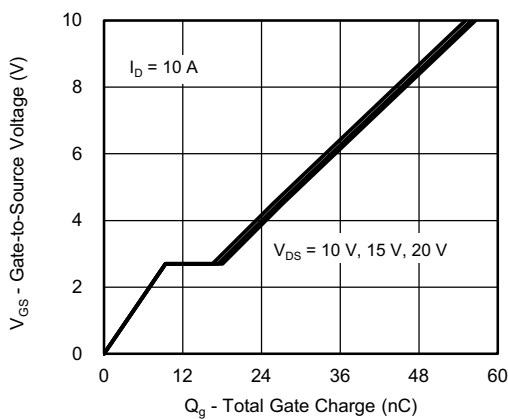
Transfer Characteristics



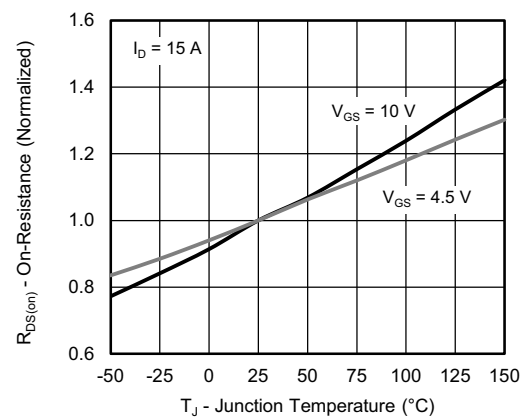
On-Resistance vs. Drain Current and Gate Voltage



Capacitance

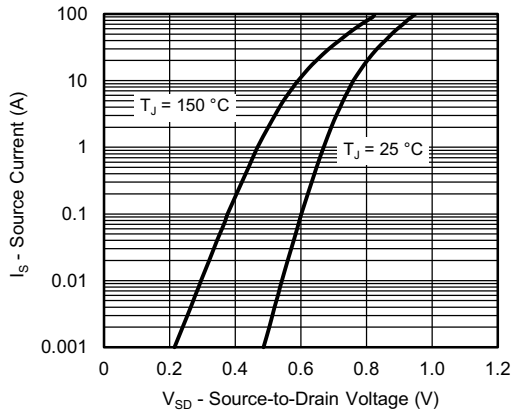


Gate Charge

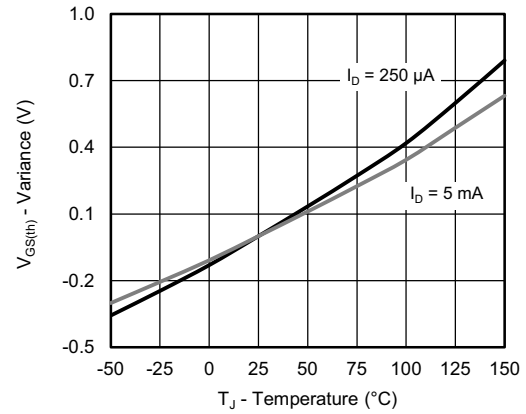


On-Resistance vs. Junction Temperature

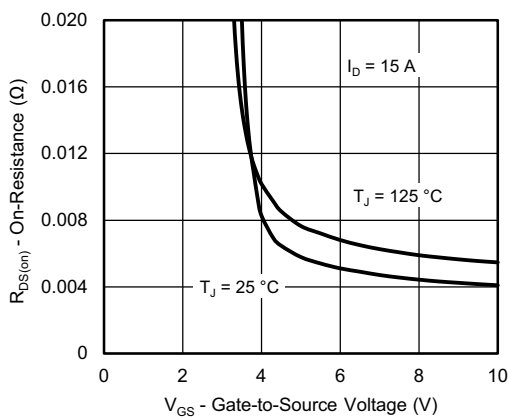
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



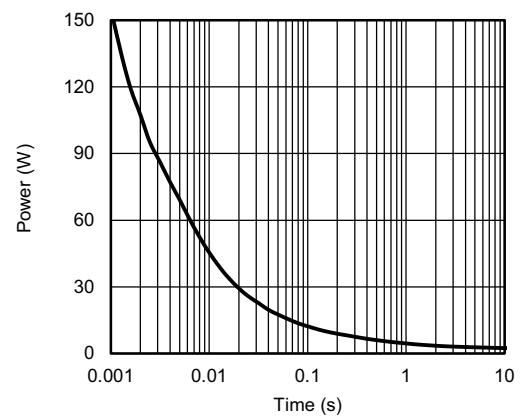
Source-Drain Diode Forward Voltage



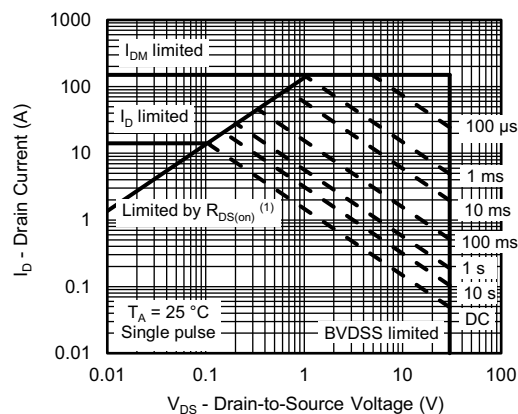
Threshold Voltage



On-Resistance vs. Gate-to-Source Voltage



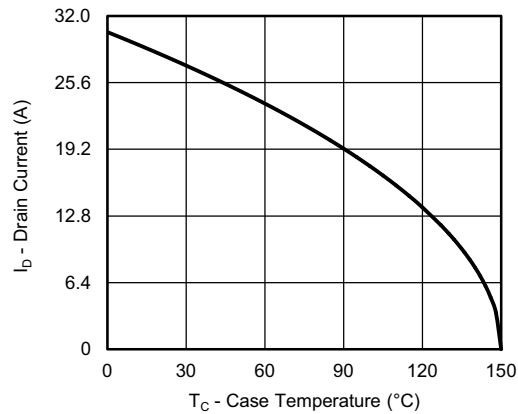
Single Pulse Power, Junction-to-Ambient



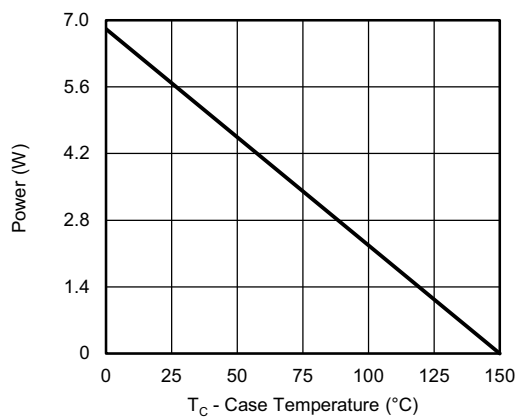
(1) $V_{GS} >$ minimum V_{GS} at which $R_{DS(on)}$ is specified

Safe Operating Area, Junction-to-Ambient

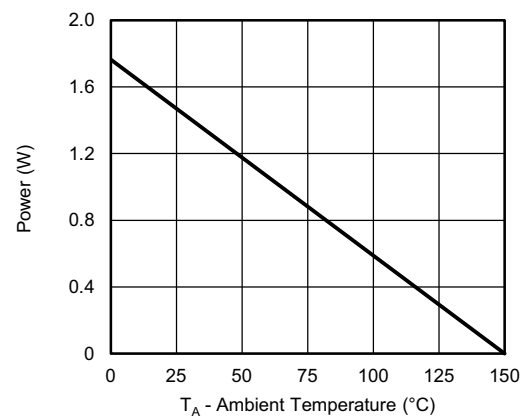
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



Current Derating ^a



Power, Junction-to-Case

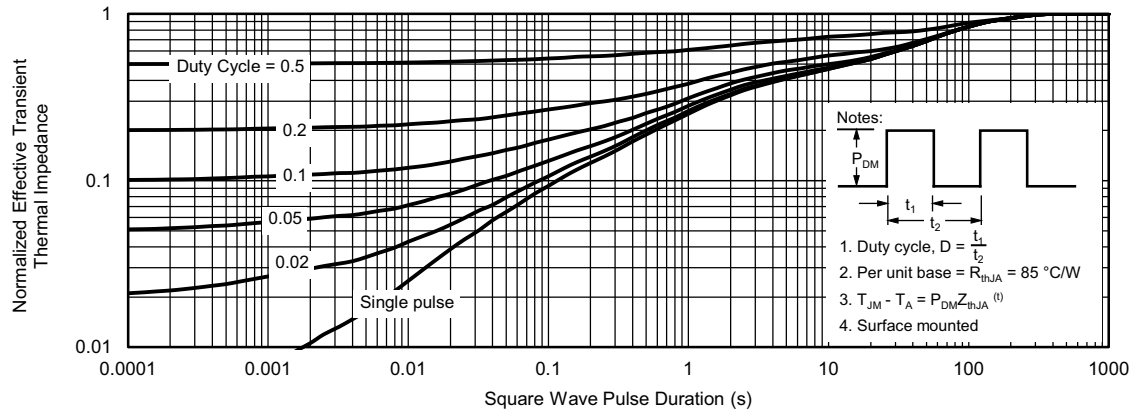


Power, Junction-to-Ambient

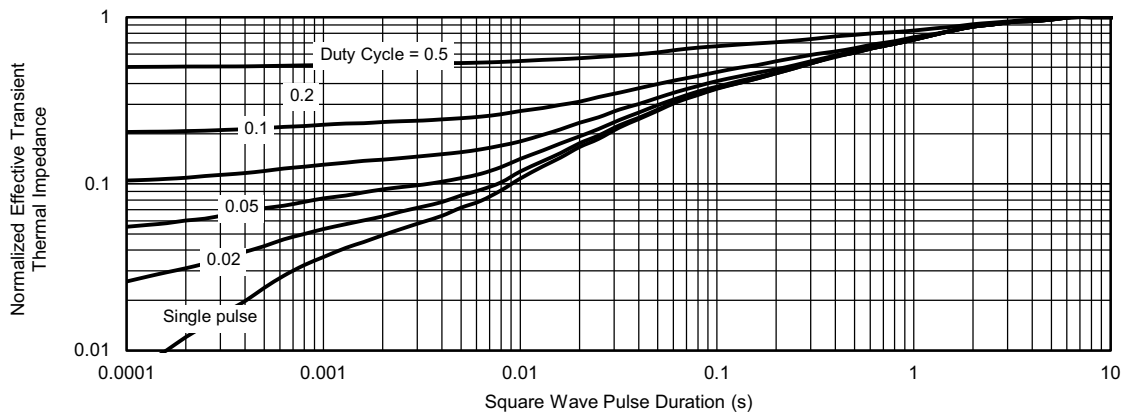
Note

- 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

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

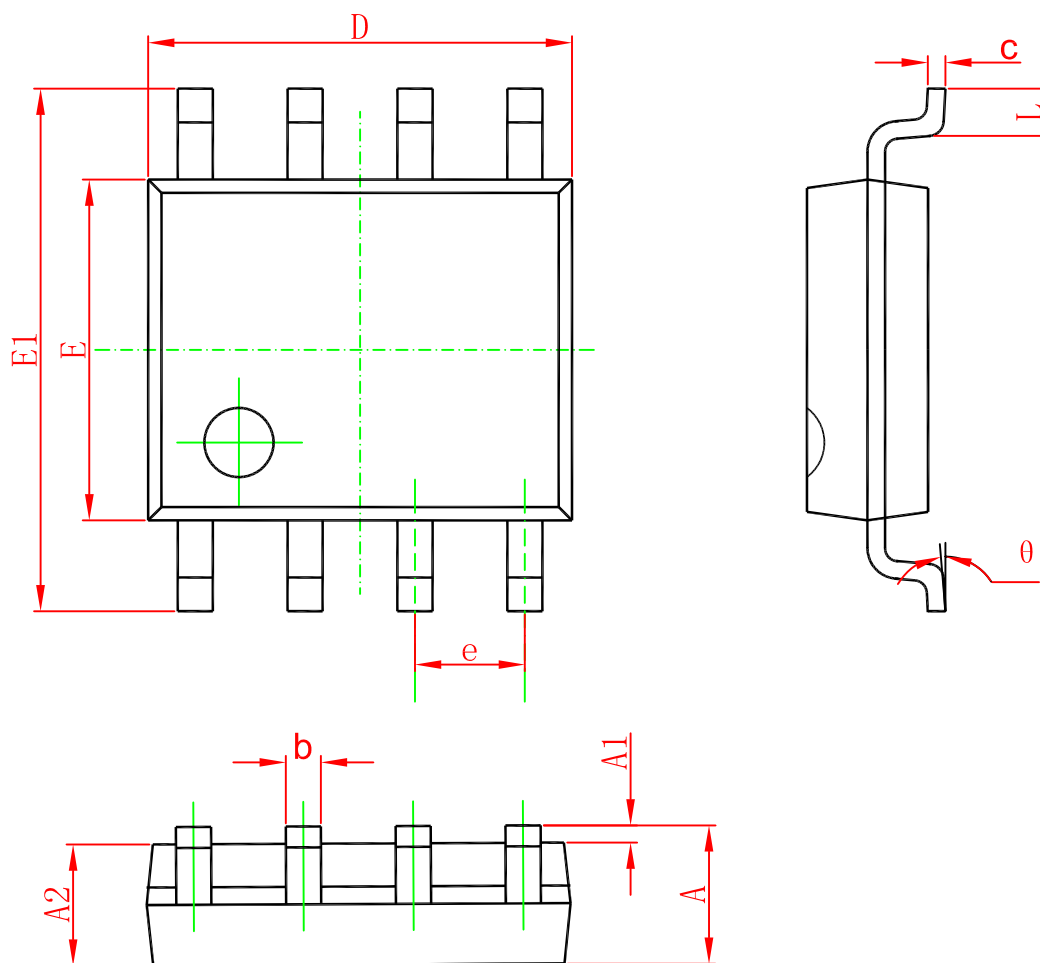


Normalized Thermal Transient Impedance, Junction-to-Ambient



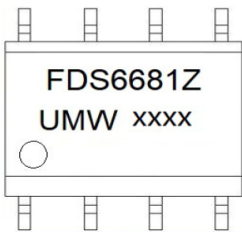
Normalized Thermal Transient Impedance, Junction-to-Case

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°

Marking



Ordering information

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