

EVVOSEMI[®]

THINK CHANGE DO



ESD



TVS



MOS



LDO



Diode



Sensor



DC-DC

Product Specification

▶ Domestic	Part Number	SPD06N80C3
▶ Overseas	Part Number	SPD06N80C3
▶ Equivalent	Part Number	SPD06N80C3

EV is the abbreviation of name EVVO

N-Channel 800V (D-S) Super Junction Power MOSFET

PRODUCT SUMMARY

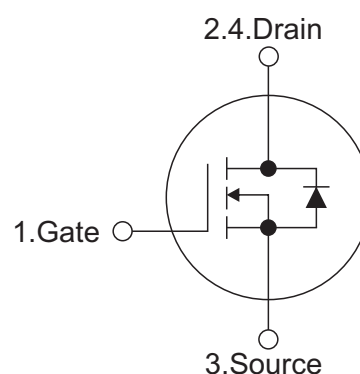
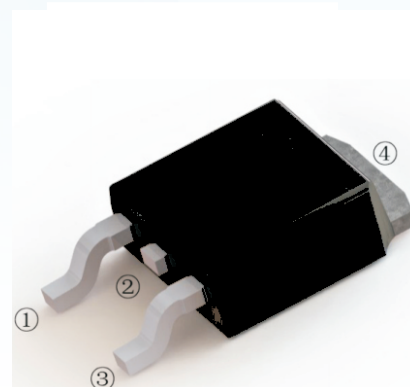
V_{DS} (V) at T_J max.	800	
$R_{DS(on)}$ at 25 °C (Ω)	$V_{GS} = 10\text{ V}$	0.85
Q_g max. (nC)	20	
Q_{gs} (nC)	2.4	
Q_{gd} (nC)	11	
Configuration	Single	

FEATURES

- Low figure-of-merit (FOM) $R_{on} \times Q_g$
- Low input capacitance (C_{iss})
- Reduced switching and conduction losses
- Ultra low gate charge (Q_g)
- Avalanche energy rated (UIS)

APPLICATIONS

- Server and telecom power supplies
- Switch mode power supplies (SMPS)
- Power factor correction power supplies (PFC)
- Lighting
 - High-intensity discharge (HID)
 - Fluorescent ballast lighting
- Industrial



ABSOLUTE MAXIMUM RATINGS ($T_C = 25\text{ °C}$, unless otherwise noted)

ABSOLUTE MAXIMUM RATINGS (T _C = 25 °C, unless otherwise noted)					
PARAMETER			SYMBOL	LIMIT	UNIT
Drain-Source Voltage			V _{DS}	800	V
Gate-Source Voltage			V _{GS}	± 30	
Continuous Drain Current (T _J = 150 °C)	V _{GS} at 10 V	T _C = 25 °C	I _D	7	A
		T _C = 100 °C		5.9	
Pulsed Drain Current ^a			I _{DM}	11	
Linear Derating Factor				1.89/1.6/0.4	W/°C
Single Pulse Avalanche Energy ^b			E _{AS}	86	mJ
Maximum Power Dissipation			P _D	99/97/46	W
Operating Junction and Storage Temperature Range			T _J , T _{stg}	-55 to +150	°C
Drain-Source Voltage Slope	T _J = 125 °C		dV/dt	50	V/ns
Reverse Diode dV/dt ^d				3.2	
Soldering Recommendations (Peak Temperature) ^c	for 10 s			300	°C

Notes

- Repetitive rating; pulse width limited by maximum junction temperature.
- $V_{DD} = 50\text{ V}$, starting $T_J = 25\text{ °C}$, $L = 28.2\text{ mH}$, $R_g = 25\text{ }\Omega$, $I_{AS} = 3.5\text{ A}$.
- 1.6 mm from case.
- $I_{SD} \leq I_D$, $dI/dt = 100\text{ A}/\mu\text{s}$, starting $T_J = 25\text{ °C}$.

THERMAL RESISTANCE RATINGS

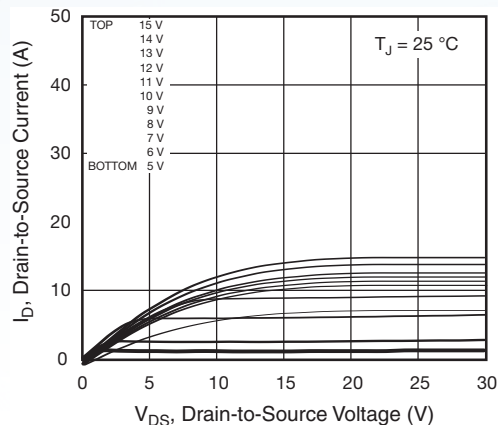
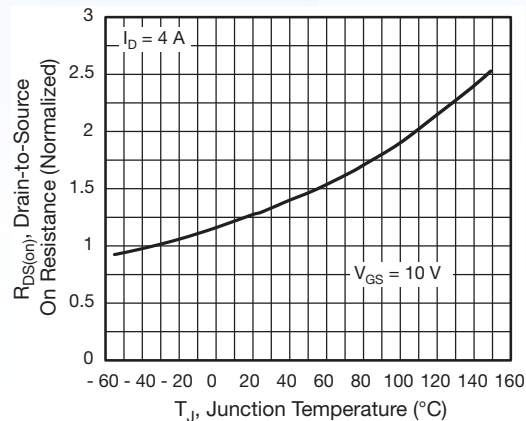
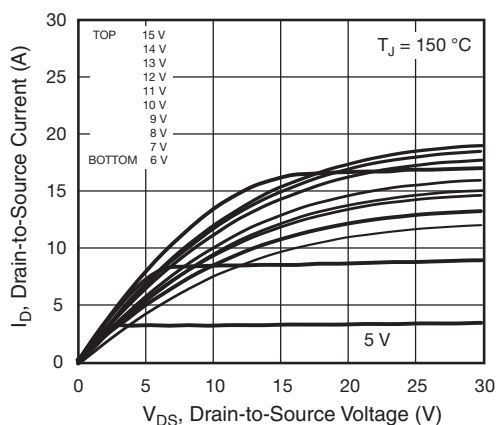
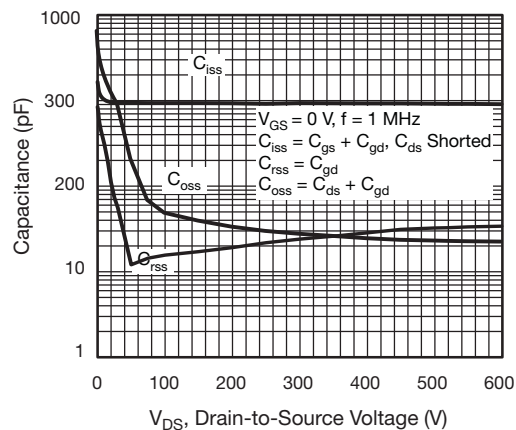
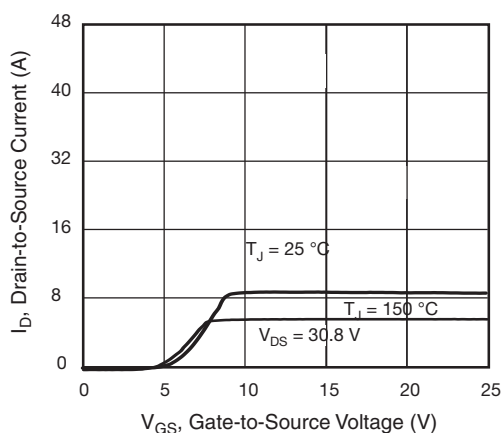
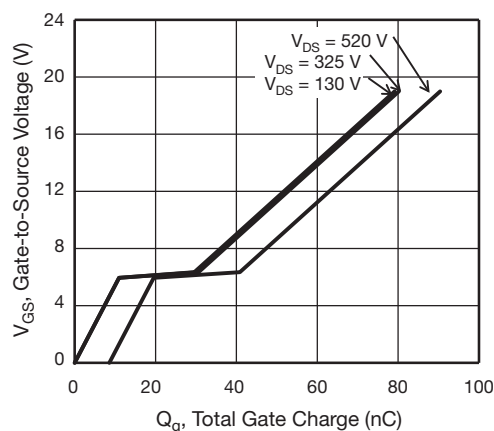
PARAMETER	SYMBOL	TYP.	MAX.	UNIT
Maximum Junction-to-Ambient	R_{thJA}	-	72	°C/W
Maximum Junction-to-Case (Drain)	R_{thJC}	-	0.7	

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}	$V_{GS} = 0\text{ V}$, $I_D = 250\text{ }\mu\text{A}$		800	-	-	V
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	Reference to $25\text{ }^{\circ}\text{C}$, $I_D = 1\text{ mA}$		-	0.65	-	V/ $^{\circ}\text{C}$
Gate-Source Threshold Voltage (N)	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250\text{ }\mu\text{A}$		2	-	4	V
Gate-Source Leakage	I_{GSS}	$V_{GS} = \pm 20\text{ V}$		-	-	± 100	nA
		$V_{GS} = \pm 30\text{ V}$		-	-	± 1	μA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 800\text{ V}$, $V_{GS} = 0\text{ V}$		-	-	1	μA
		$V_{DS} = 520\text{ V}$, $V_{GS} = 0\text{ V}$, $T_J = 125\text{ }^{\circ}\text{C}$		-	-	10	
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS} = 10\text{ V}$	$I_D = 4\text{ A}$	-	0.85	-	Ω
Forward Transconductance	g_{fs}	$V_{DS} = 30\text{ V}$, $I_D = 4\text{ A}$		-	19	-	S
Dynamic							
Input Capacitance	C_{iss}	$V_{GS} = 0\text{ V}$, $V_{DS} = 100\text{ V}$, $f = 1\text{ MHz}$		-	373	-	pF
Output Capacitance	C_{oss}			-	26	-	
Reverse Transfer Capacitance	C_{rss}			-	14	-	
Effective Output Capacitance, Energy Related ^a	$C_{o(er)}$	$V_{DS} = 0\text{ V to } 520\text{ V}$, $V_{GS} = 0\text{ V}$		-	46	-	
Effective Output Capacitance, Time Related ^b	$C_{o(tr)}$			-	64	-	
Total Gate Charge	Q_g	$V_{GS} = 10\text{ V}$	$I_D = 4\text{ A}$, $V_{DS} = 520\text{ V}$	-	26	-	nC
Gate-Source Charge	Q_{gs}			-	2.1	-	
Gate-Drain Charge	Q_{gd}			-	2.8	-	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 520\text{ V}$, $I_D = 4\text{ A}$, $V_{GS} = 10\text{ V}$, $R_g = 9.1\text{ }\Omega$		-	26	-	ns
Rise Time	t_r			-	55.7	-	
Turn-Off Delay Time	$t_{d(off)}$			-	71	-	
Fall Time	t_f			-	41	-	
Gate Input Resistance	R_g	$f = 1\text{ MHz}$, open drain		-	3.5	-	Ω
Drain-Source Body Diode Characteristics							
Continuous Source-Drain Diode Current	I_S	MOSFET symbol showing the integral reverse p - n junction diode 		-	-	7	A
Pulsed Diode Forward Current	I_{SM}			-	-	18	
Diode Forward Voltage	V_{SD}	$T_J = 25\text{ }^{\circ}\text{C}$, $I_S = 4\text{ A}$, $V_{GS} = 0\text{ V}$		-	-	1.4	V
Reverse Recovery Time	t_{rr}	$T_J = 25\text{ }^{\circ}\text{C}$, $I_F = I_S = 4\text{ A}$, $di/dt = 100\text{ A}/\mu\text{s}$, $V_R = 400\text{ V}$		-	192	-	ns
Reverse Recovery Charge	Q_{rr}			-	2.4	-	μC
Reverse Recovery Current	I_{RRM}			-	11	-	A

Notes

- a. $C_{oss(er)}$ is a fixed capacitance that gives the same energy as C_{oss} while V_{DS} is rising from 0 % to 80 % V_{DSS} .
 b. $C_{oss(tr)}$ is a fixed capacitance that gives the same charging time as C_{oss} while V_{DS} is rising from 0 % to 80 % V_{DSS} .

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

Fig. 1 - Typical Output Characteristics

Fig. 4 - Normalized On-Resistance vs. Temperature

Fig. 2 - Typical Output Characteristics

Fig. 5 - Typical Capacitance vs. Drain-to-Source Voltage

Fig. 3 - Typical Transfer Characteristics

Fig. 6 - Typical Gate Charge vs. Gate-to-Source Voltage

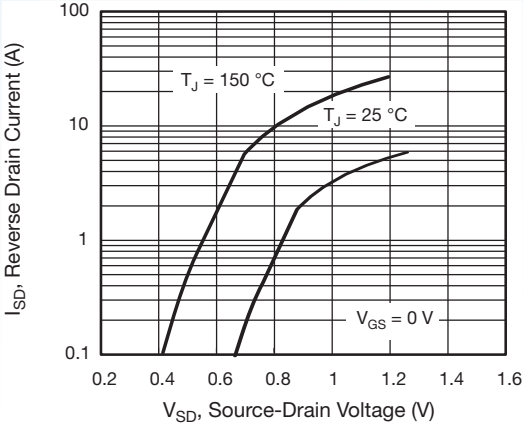


Fig. 7 - Typical Source-Drain Diode Forward Voltage

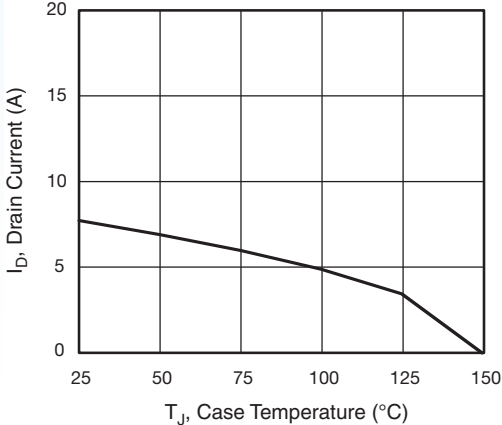


Fig. 9 - Maximum Drain Current vs. Case Temperature

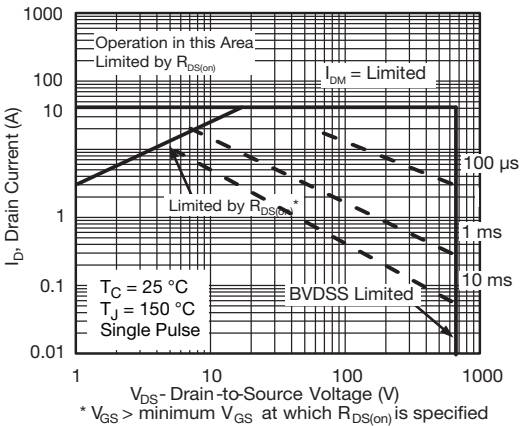


Fig. 8 - Maximum Safe Operating Area

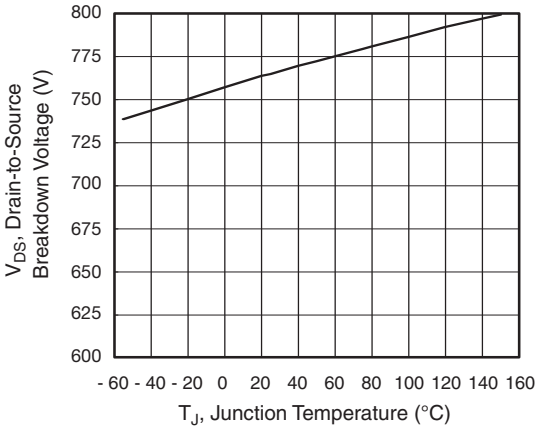


Fig. 10 - Temperature vs. Drain-to-Source Voltage

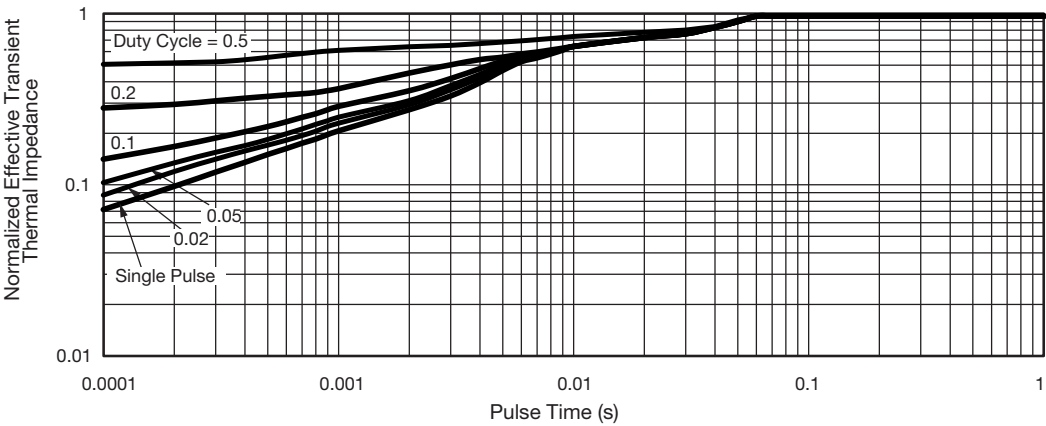


Fig. 11 - Normalized Thermal Transient Impedance, Junction-to-Case

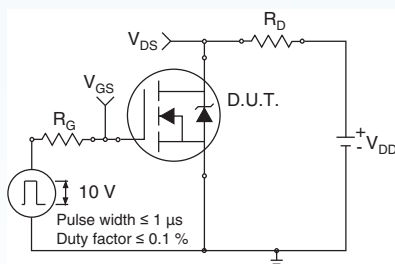


Fig. 12 - Switching Time Test Circuit

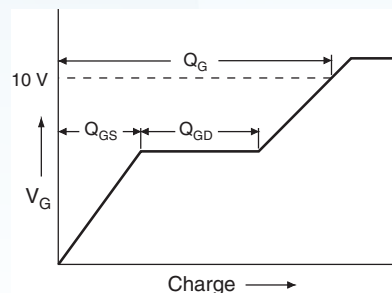


Fig. 16 - Basic Gate Charge Waveform

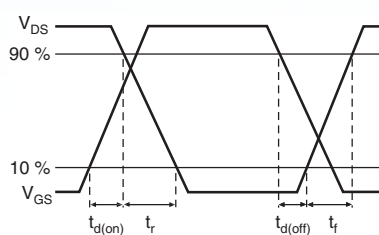


Fig. 13 - Switching Time Waveforms

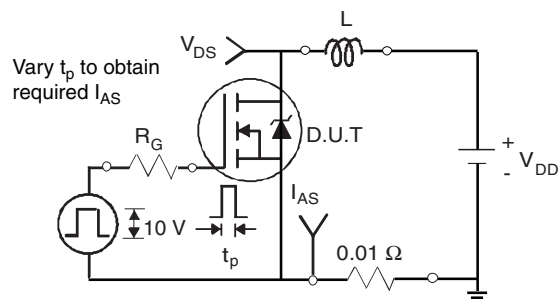


Fig. 14 - Unclamped Inductive Test Circuit

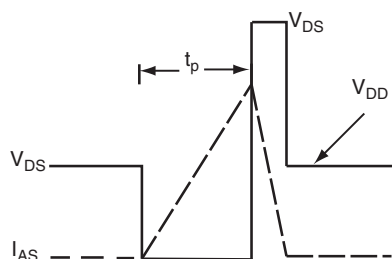


Fig. 15 - Unclamped Inductive Waveforms

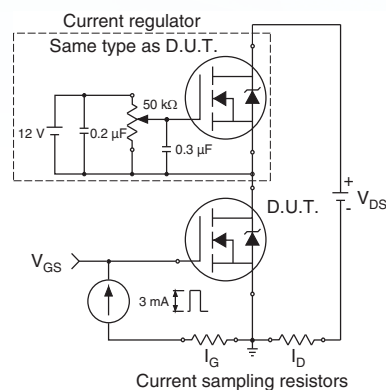


Fig. 17 - Gate Charge Test Circuit

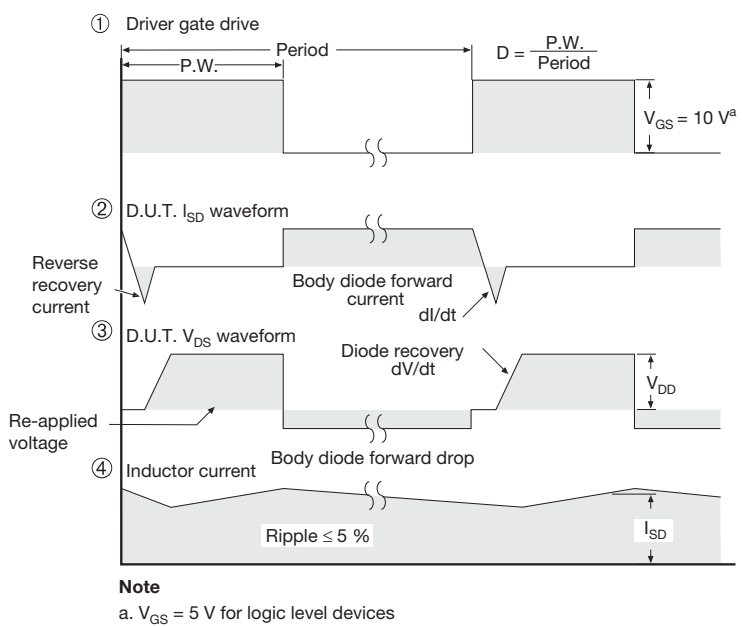
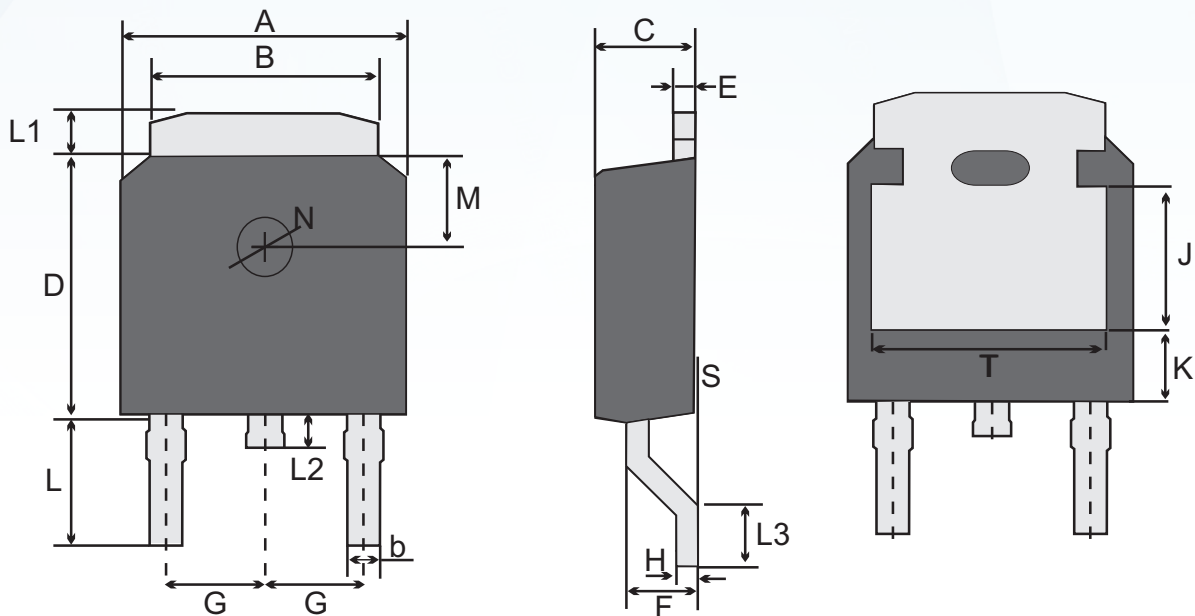


Fig. 18 - For N-Channel

TO-252W(D-PAK) Package Outline Dimensions



TO-252W(D-PAK) mechanical data

UNIT		A	B	b	C	D	E	F	G	H	L	L1	L2	L3	S	M	N	J	K	T
mm	max	6.7	5.5	0.8	2.5	6.3	0.6	1.8	2.29 TYPICAL	0.55	3.1	1.2	1.0	1.75	0.23	1.8 TYPICAL	1.3 TYPICAL	3.23 ref.	1.75 ref.	5.24 ref.
	typ	6.6	5.3	0.7	2.3	6.1	0.5	1.5		0.50	2.8	1.0	0.8	1.30	0.15					
	min	6.3	5.1	0.3	2.1	5.9	0.4	1.3		0.45	2.7	0.8	0.6	1.00	0.0					
mil	max	264	217	31	98	248	24	71	90 TYPICAL	22	122	47	39	69	9	71 TYPICAL	51 TYPICAL	127 ref.	68 ref.	206 ref.
	typ	260	209	28	90	240	20	59		20	110	39	31	51	6					
	min	248	201	12	83	232	16	51		18	106	31	24	55	0					

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