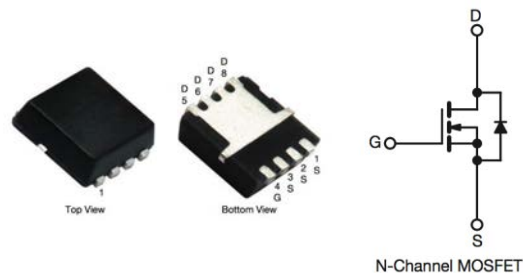


N-CHANNEL ENHANCEMENT MODE POWER MOSFET
PRIMARY CHARACTERISTICS

BV_{DSS}	$R_{DS(on)MAX}$	I_D
30V	$4.5m\Omega @ V_{GS}=10V$	30A
	$6m\Omega @ V_{GS}=4.5V$	

SPR-PAK PACKAGE

GENERAL DESCRIPTION

- DC/DC Converters in Computing, Servers, and POL
- Isolated DC/DC Converters in Telecom and Industrial

MECHANICAL DATA

- Case : Molded plastic, SPR-PAK
- Polarity : Shown above
- Terminals : Plated terminals, solderable per MIL-STD-750, Method 2026
- Epoxy : UL94-V0 rated flame retardant

Absolute Maximum Ratings @ $T_A=25^{\circ}C$ unless otherwise noted

Parameter		Symbol	Ratings	Unit
Drain-Source Voltage		V_{DSS}	30	V
Gate-Source Voltage		V_{GSS}	± 20	V
Drain Current (Continuous) *AC	$T_C=25^{\circ}C$	I_D	30	A
	$T_C=70^{\circ}C$		23	
Drain Current (Pulse) *B		I_{DM}	120	A
Power Dissipation	$T_C=25^{\circ}C$	P_D	24	W
Operating Temperature/ Storage Temperature		T_J/T_{STG}	-55~150	$^{\circ}C$

Thermal Resistance Ratings

Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient	Steady State	R_{thJA}	45	55	$^{\circ}C/W$
Maximum Junction-to-Case (Drain)	Steady State	R_{thJC}	4.2	5.2	



N-CHANNEL ENHANCEMENT MODE POWER MOSFET

Electrical Characteristics @T_A=25°C unless otherwise noted

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D = 250 μ A	30	--	--	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 30 V, V _{GS} = 0V	--	--	1	μ A
Gate Threshold Voltage	V _{GS(TH)}	V _{GS} = V _{DS} , I _{DS} = 250 μ A	1.2	1.65	2.5	V
Gate Leakage Current	I _{GSS}	V _{GS} = ±20V, V _{DS} =0V	--	--	±100	nA
Drain-Source On-state Resistance	R _{DS(on)}	V _{GS} = 10V, I _D = 20A	--	3.6	4.5	mΩ
	R _{DS(on)}	V _{GS} = 4.5V, I _D = 10A	--	4.5	6	mΩ
Forward Transconductance	g _{FS}	V _{DS} = 5V, I _D = 20A	--	83	--	S
Diode Forward Voltage	V _{SD}	I _{SD} = 1A , V _{GS} =0V	--	--	1	V
Diode Forward Current	I _S	T _C =25°C	--	--	30	A
Switching						
Total Gate Charge	Q _g	V _{GS} =10V, V _{DS} =15V, I _D =20A	--	18.8	--	nC
Gate-Source Charge	Q _{gs}		--	3.7	--	nC
Gate-Drain Charge	Q _{gd}		--	4	--	nC
Turn-on Delay Time	t _{d (on)}	V _{GS} =10V, V _{DS} =15V, R _L =0.75Ω, R _{GEN} =3Ω	--	7	--	ns
Turn-on Rise Time	t _r		--	3	--	ns
Turn-off Delay Time	t _{d(off)}		--	21	--	ns
Turn-Off Fall Time	t _f		--	4	--	ns
Dynamic						
Input Capacitance	C _{iss}	V _{DS} =15V,V _{GS} =0V, f=1.0MHz	--	1320	--	pF
Output Capacitance	C _{oss}		--	530	--	pF
Reverse Transfer Capacitance	C _{rss}		--	70	--	pF

A: The value of R_{θJA} is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with T_A = 25°C. The value in any given application depends on the user's specific board design.

B: Repetitive rating, pulse width limited by junction temperature.

C: The current rating is based on the t_s ≤ 10s junction to ambient thermal resistance rating.

**N-CHANNEL ENHANCEMENT MODE POWER MOSFET**

Typical Performance Characteristics (T_J = 25 °C, unless otherwise noted)

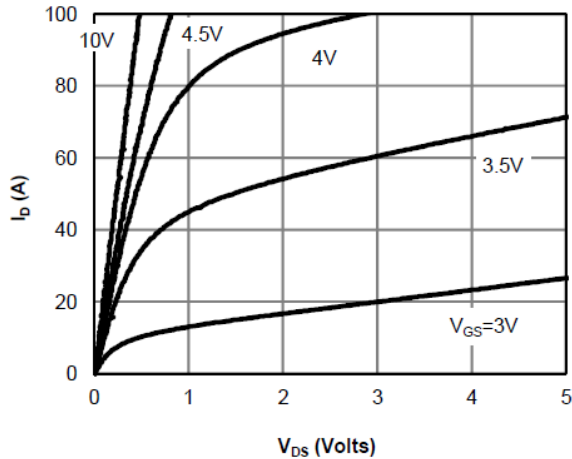


Figure 1: On-Region Characteristics

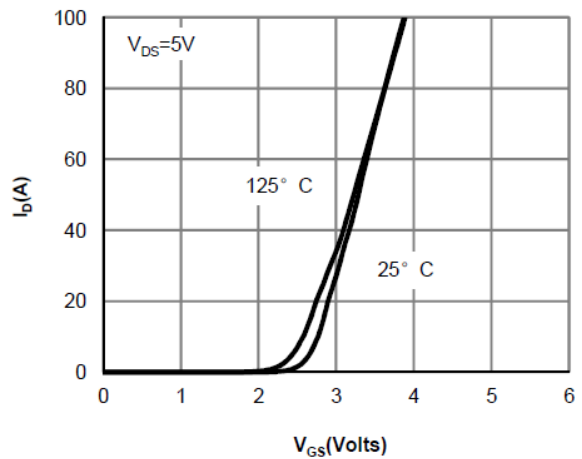


Figure 2: Transfer Characteristics

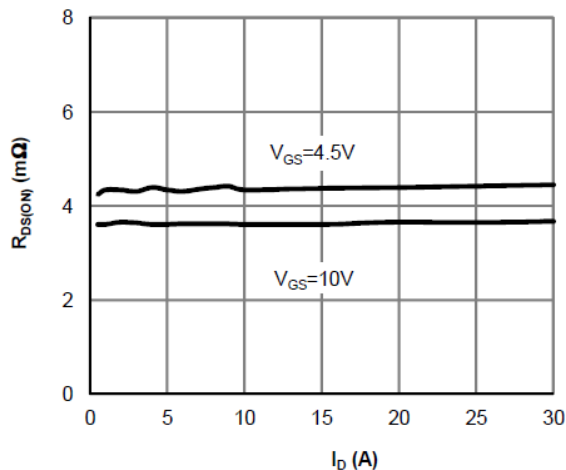


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

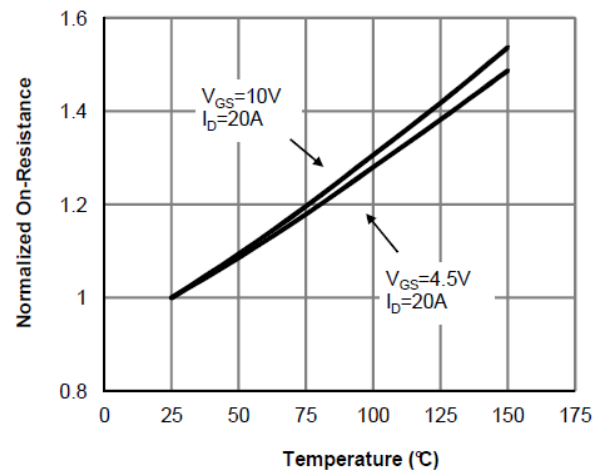


Figure 4: On-Resistance vs. Junction Temperature

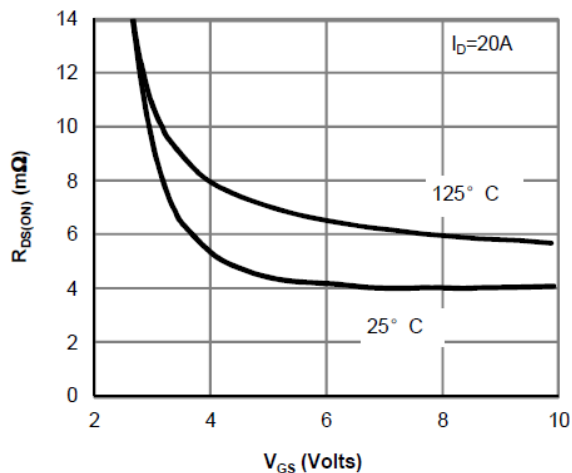


Figure 5: On-Resistance vs. Gate-Source Voltage

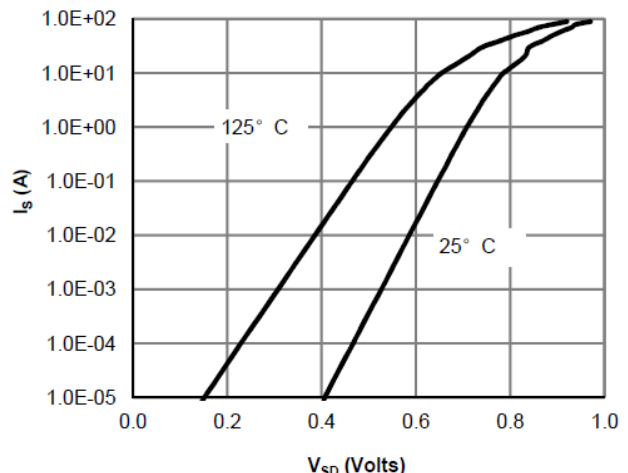
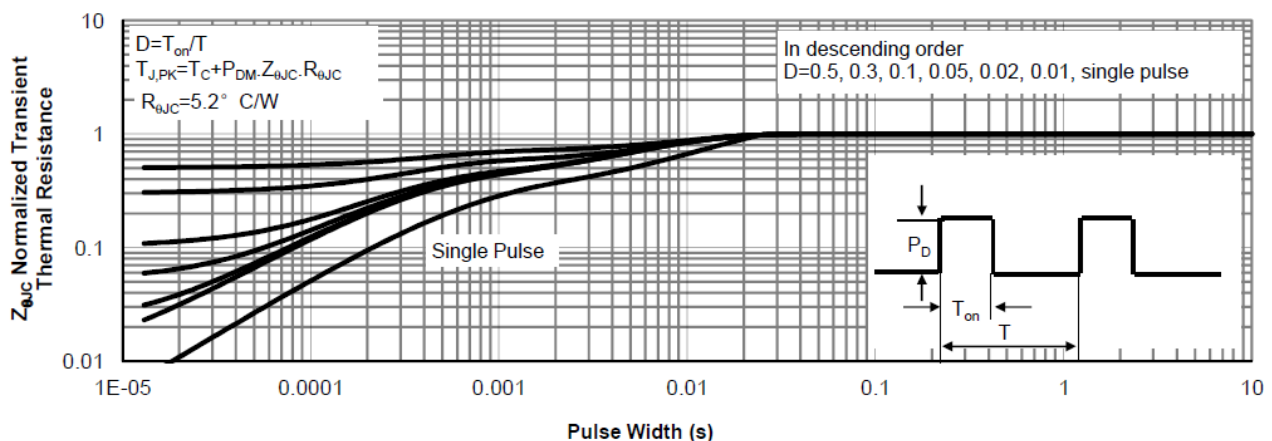
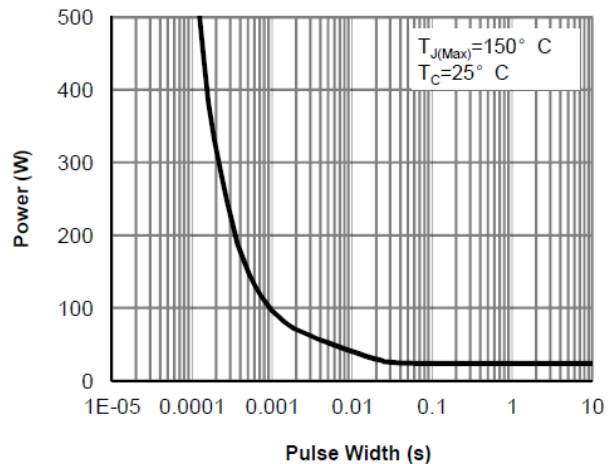
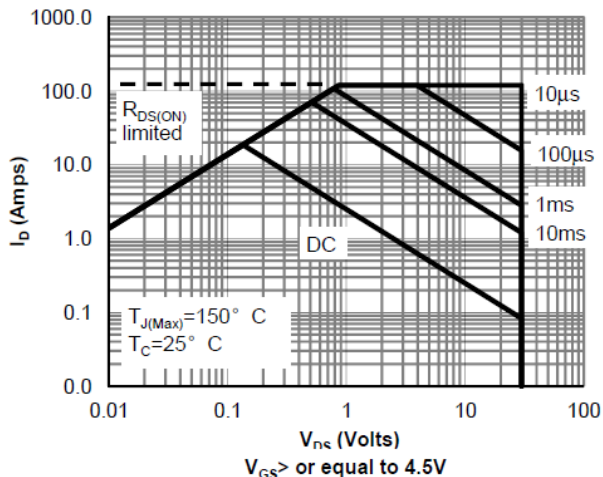
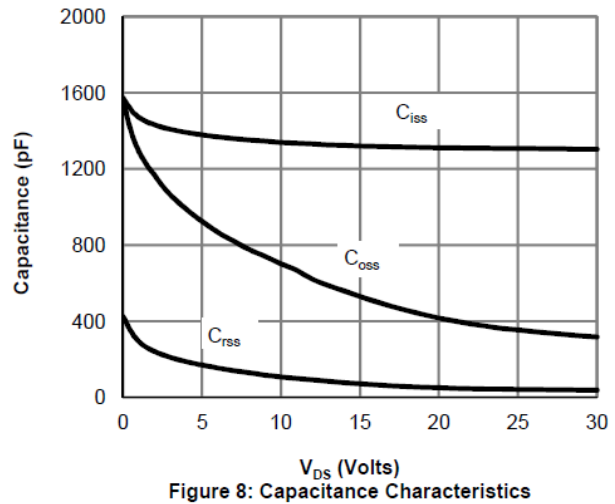
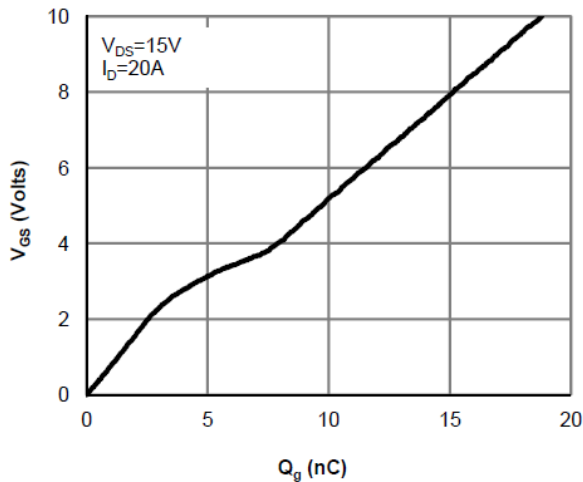
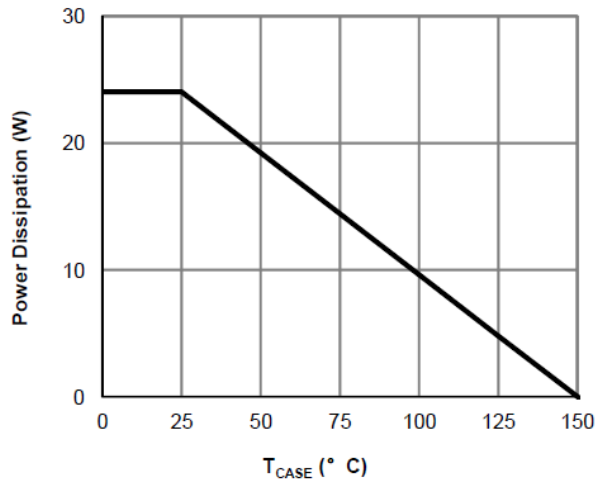
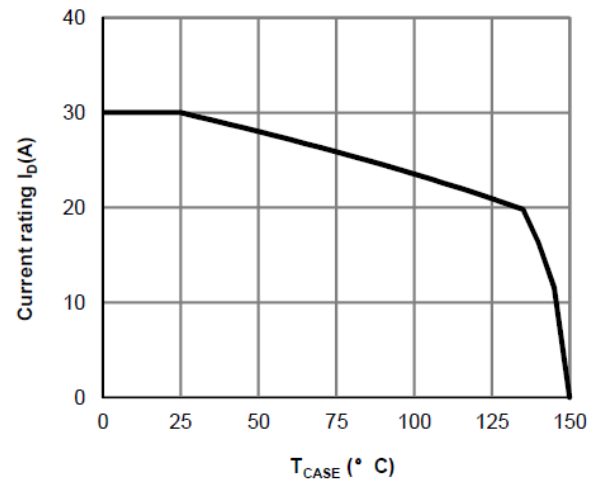
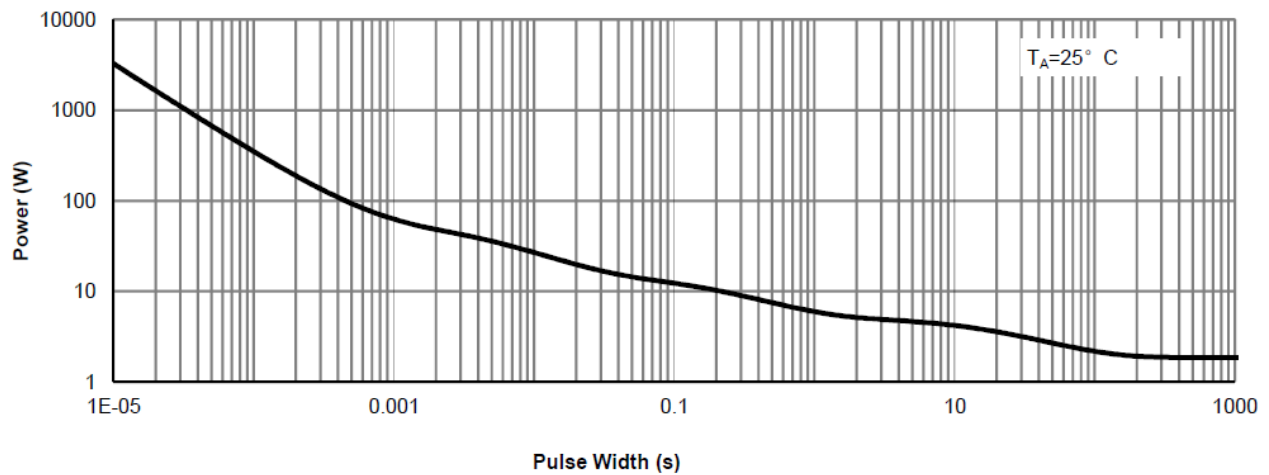
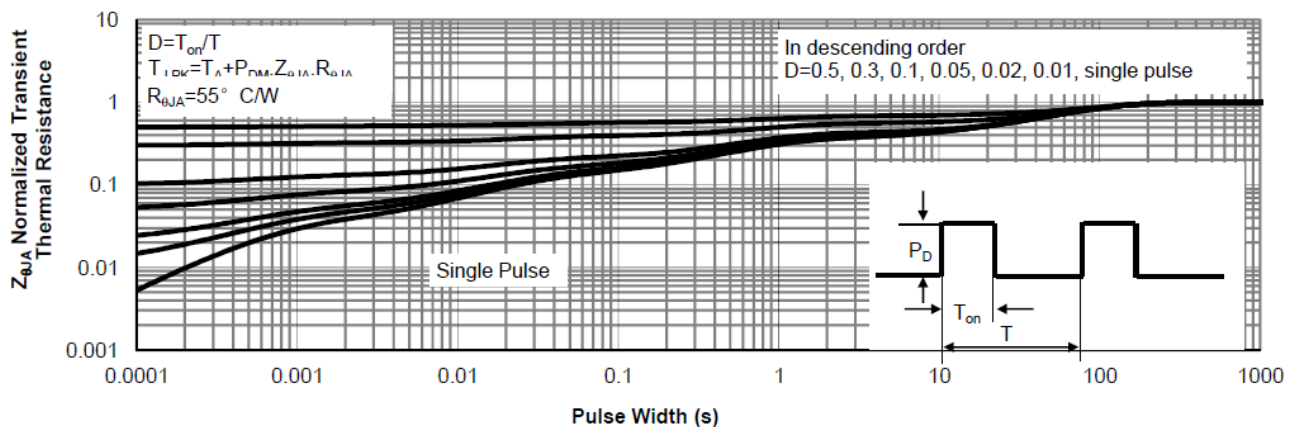


Figure 6: Body-Diode Characteristics

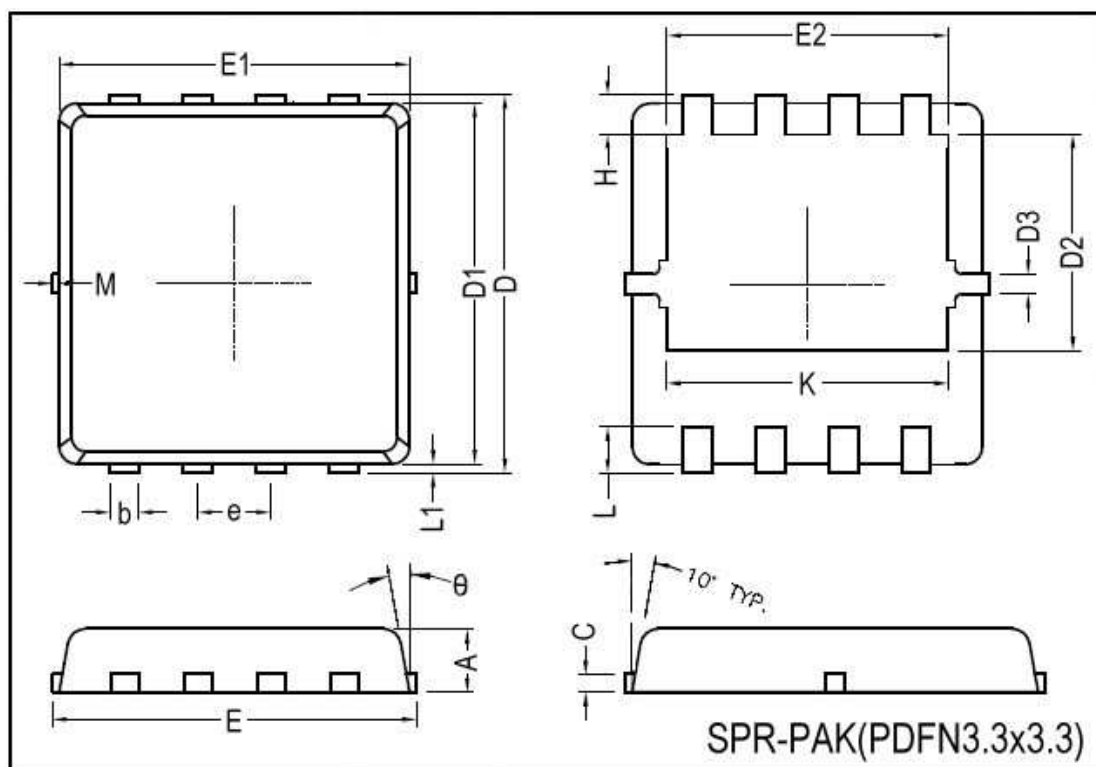
**N-CHANNEL ENHANCEMENT MODE POWER MOSFET**

**N-CHANNEL ENHANCEMENT MODE POWER MOSFET****Figure 12: Power De-rating****Figure 13: Current De-rating****Figure 14: Single Pulse Power Rating Junction-to-Ambient****Figure 15: Normalized Maximum Transient Thermal Impedance**



Outline Drawing

SPR-PAK



REF.	Millimeter			REF.	Millimeter		
	Min.	Nom.	Max.		Min.	Nom.	Max.
A	0.70	0.75	0.85	E1	2.95	3.15	3.20
b	0.25	0.30	0.35	E2	2.30	2.49	2.55
C	0.10	0.15	0.25	e	0.65 BSC		
D	3.15	3.35	3.45	H	0.30	0.42	0.53
D1	2.95	3.10	3.20	L	0.30	0.40	0.50
D2	1.48	1.71	1.93	L1	-	0.13	0.20
D3	-	0.13	-	θ	-	10°	12°
E	3.05	3.23	3.40	M	-	-	0.15

Dimensions in inches and (millimeters)

Rev.D

**Ordering Information:**

Device PN	Packing
SSPR7904-T ⁽¹⁾ H ⁽²⁾ -WS ⁽³⁾	Tape&Reel: 3 Kpcs/Reel

Note: (1) Packing code, Tape & Reel Packing

(2) Haloge free product for packing code suffix "H"

(3) WS : Willas brand abbreviation, Label Type does not display

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