

DMG7430LFGQ-13-VB Datasheet

N-Channel 30-V (D-S) MOSFET

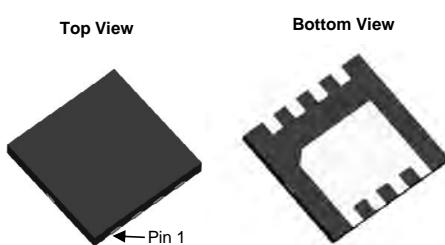
V _{DS}	30	V
R _{DS(on),typ} V _{GS} =10V	13	mΩ
R _{DS(on),typ} V _{GS} =4.5V	19	mΩ
I _D	30	A

FEATURES

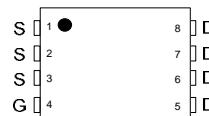
- Halogen-free
- Trench Power MOSFET
- 100 % R_g and UIS Tested



DFN 3x3 EP

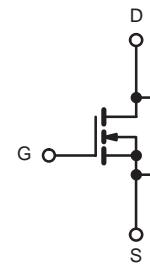


Top View



APPLICATIONS

- DC/DC Conversion
 - Low-Side Switch
- Notebook PC
- Gaming



N-Channel MOSFET

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)	I _D	30	A
		20	
		21.5 ^{b, c}	
		17.1 ^{b, c}	
Pulsed Drain Current	I _{DM}	100	
Continuous Source-Drain Diode Current	I _S	13	
		3.1 ^{b, c}	
Single Pulse Avalanche Current	I _{AS}	10	mJ
Avalanche Energy	E _{AS}	5	
Maximum Power Dissipation	P _D	60	W
		30	
		3.7 ^{b, c}	
		2.4 ^{b, c}	
Operating Junction and Storage Temperature Range	T _J , T _{stg}	- 55 to 150	°C

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient ^{b, d}	R _{thJA}	27	34	°C/W
Maximum Junction-to-Foot (Drain)	R _{thJF}	6	7.5	

Notes:

- Based on T_C = 25 °C.
- Surface Mounted on 1" x 1" FR4 board.
- t = 10 s.
- Maximum under Steady State conditions is 85 °C/W.

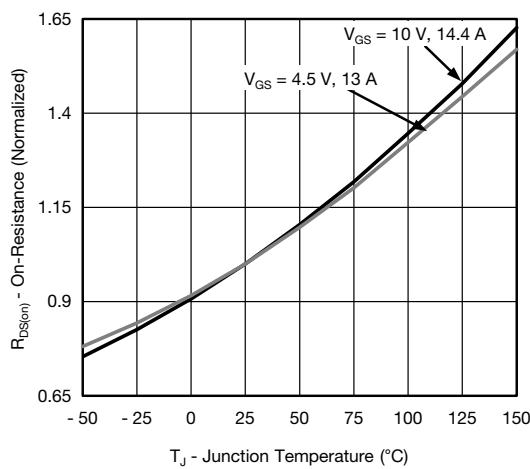
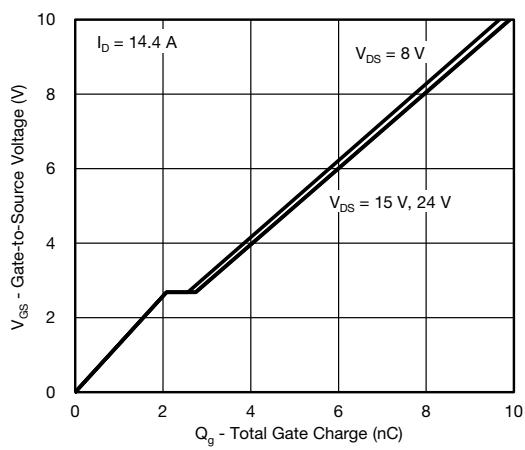
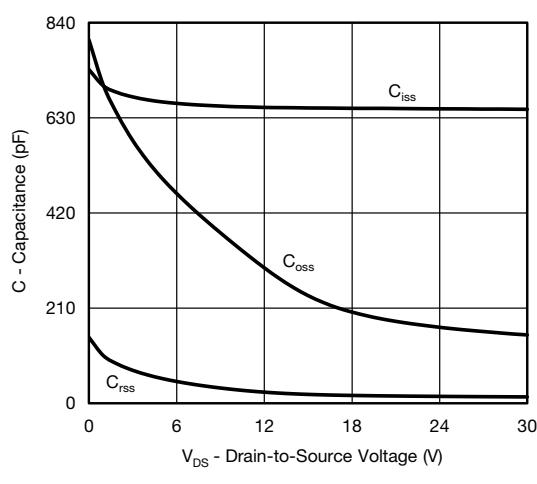
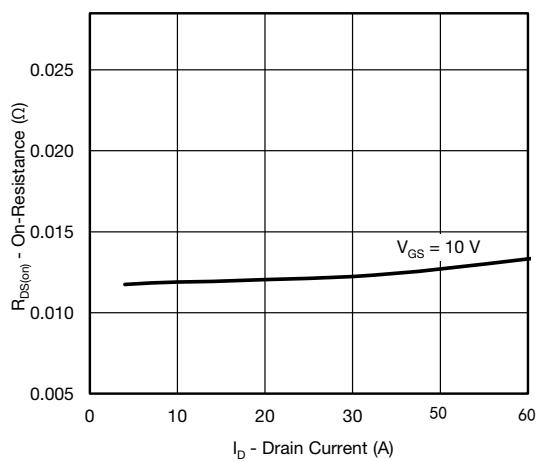
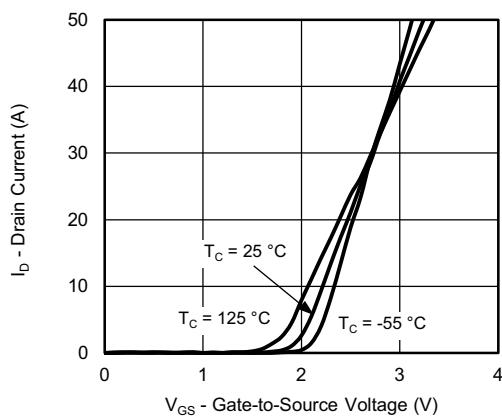
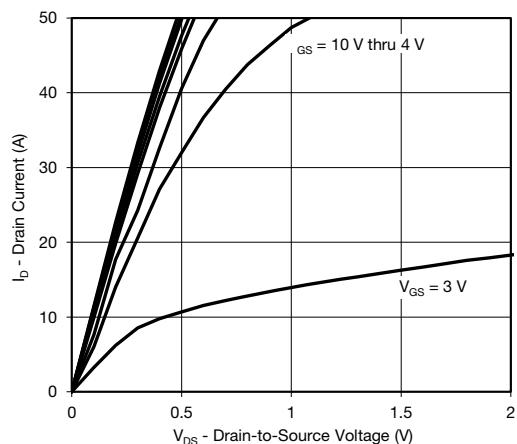
SPECIFICATIONS $T_J = 25^\circ\text{C}$, unless otherwise noted

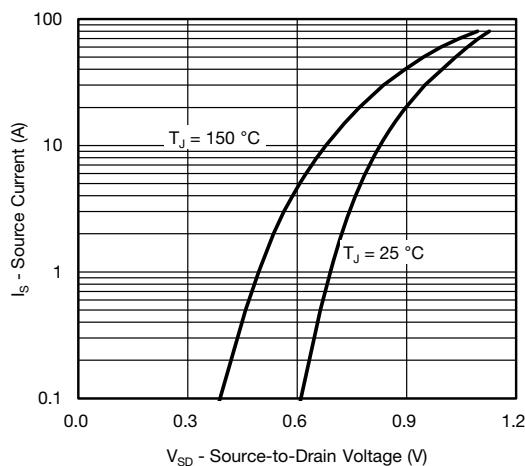
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit	
Static							
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0 \text{ V}, I_D = 1 \text{ mA}$	30			V	
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	$I_D = 250 \mu\text{A}$		27		mV/°C	
$V_{GS(\text{th})}$ Temperature Coefficient	$\Delta V_{GS(\text{th})}/T_J$			- 5.6			
Gate-Source Threshold Voltage	$V_{GS(\text{th})}$	$V_{DS} = V_{GS}, I_D = 250 \mu\text{A}$	1.0		3.0	V	
Gate-Source Leakage	I_{GSS}	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 20 \text{ V}$			± 100	nA	
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 30 \text{ V}, V_{GS} = 0 \text{ V}$			1	μA	
		$V_{DS} = 30 \text{ V}, V_{GS} = 0 \text{ V}, T_J = 55^\circ\text{C}$			10		
On-State Drain Current ^a	$I_{D(\text{on})}$	$V_{DS} \geq 5 \text{ V}, V_{GS} = 10 \text{ V}$	30			A	
Drain-Source On-State Resistance ^a	$R_{DS(\text{on})}$	$V_{GS} = 10 \text{ V}, I_D = 15 \text{ A}$		13		mΩ	
		$V_{GS} = 4.5 \text{ V}, I_D = 10 \text{ A}$		19			
Forward Transconductance ^a	g_{fs}	$V_{DS} = 15 \text{ V}, I_D = 15 \text{ A}$		75		S	
Dynamic^b							
Input Capacitance	C_{iss}	$V_{DS} = 15 \text{ V}, V_{GS} = 0 \text{ V}, f = 1 \text{ MHz}$			900	pF	
Output Capacitance	C_{oss}				236		
Reverse Transfer Capacitance	C_{rss}				20		
Total Gate Charge	Q_g	$V_{DS} = 15 \text{ V}, V_{GS} = 10 \text{ V}, I_D = 10 \text{ A}$			20	nC	
Gate-Source Charge	Q_{gs}	$V_{DS} = 15 \text{ V}, V_{GS} = 4.5 \text{ V}, I_D = 10 \text{ A}$			9		
Gate-Drain Charge	Q_{gd}				2.1		
Gate Resistance	R_g		$f = 1 \text{ MHz}$	0.2	1.1	2.2	
Turn-On Delay Time	$t_{d(\text{on})}$				8	16	ns
Rise Time	t_r	$V_{DD} = 15 \text{ V}, R_L = 1.5 \Omega$ $I_D \geq 10 \text{ A}, V_{GEN} = 4.5 \text{ V}, R_g = 1 \Omega$			16	30	
Turn-Off Delay Time	$t_{d(\text{off})}$				17	35	
Fall Time	t_f				7	15	
Turn-On Delay Time	$t_{d(\text{on})}$				14	30	
Rise Time	t_r	$V_{DD} = 15 \text{ V}, R_L = 1.5 \Omega$ $I_D \geq 10 \text{ A}, V_{GEN} = 10 \text{ V}, R_g = 1 \Omega$			50	100	ns
Turn-Off Delay Time	$t_{d(\text{off})}$				16	30	
Fall Time	t_f				8	18	
Drain-Source Body Diode Characteristics							
Continuous Source-Drain Diode Current	I_S	$T_C = 25^\circ\text{C}$			13	A	
Pulse Diode Forward Current ^a	I_{SM}				100		
Body Diode Voltage	V_{SD}	$I_S = 3 \text{ A}$			1.2	V	
Body Diode Reverse Recovery Time	t_{rr}	$I_F = 10 \text{ A}, dI/dt = 100 \text{ A}/\mu\text{s}, T_J = 25^\circ\text{C}$			40	ns	
Body Diode Reverse Recovery Charge	Q_{rr}				20	nC	
Reverse Recovery Fall Time	t_a				12.5	ns	
Reverse Recovery Rise Time	t_b				7.5		

Notes:

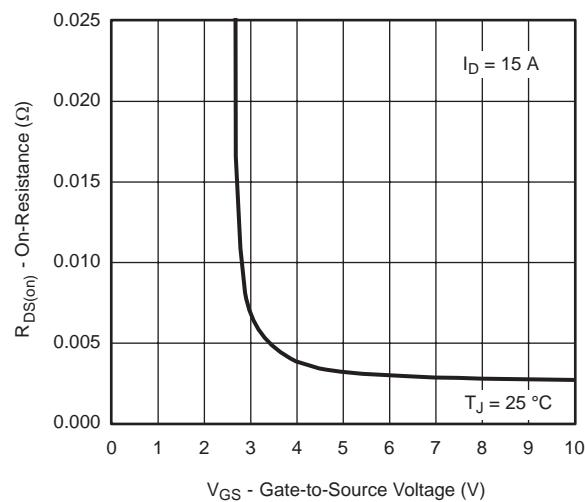
- a. Pulse test; pulse width $\leq 300 \mu\text{s}$, duty cycle $\leq 2\%$
- b. Guaranteed by design, not subject to production testing.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

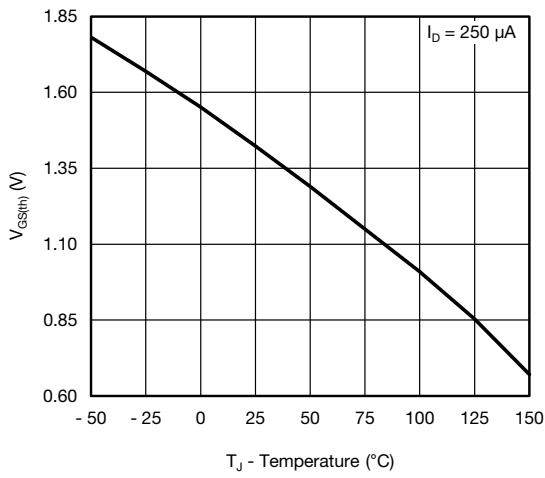
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted


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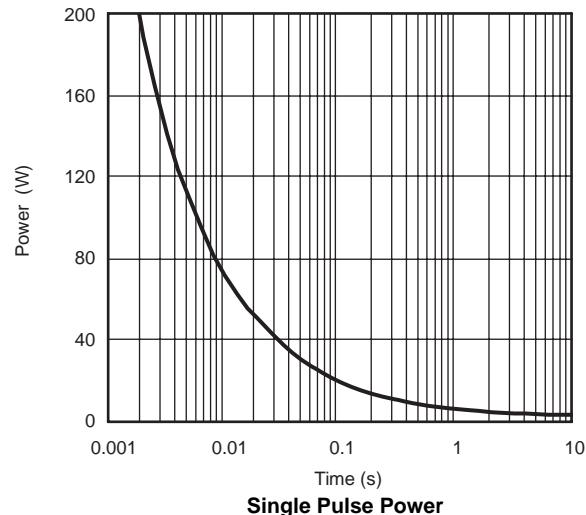
Source-Drain Diode Forward Voltage



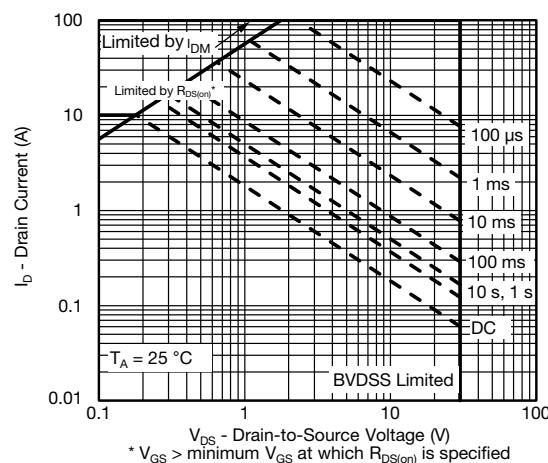
On-Resistance vs. Gate-to-Source Voltage



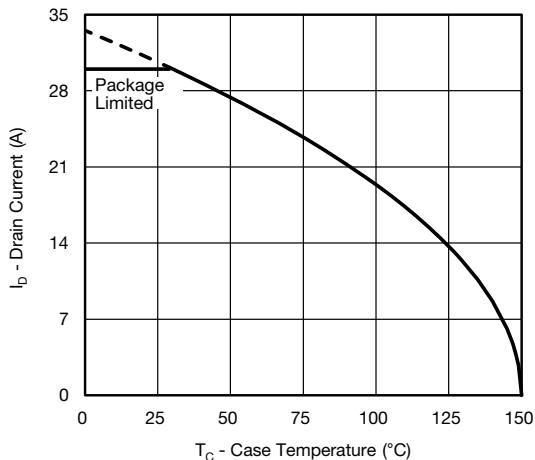
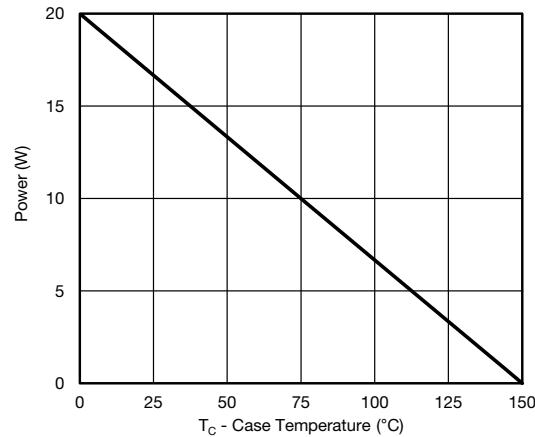
Threshold Voltage



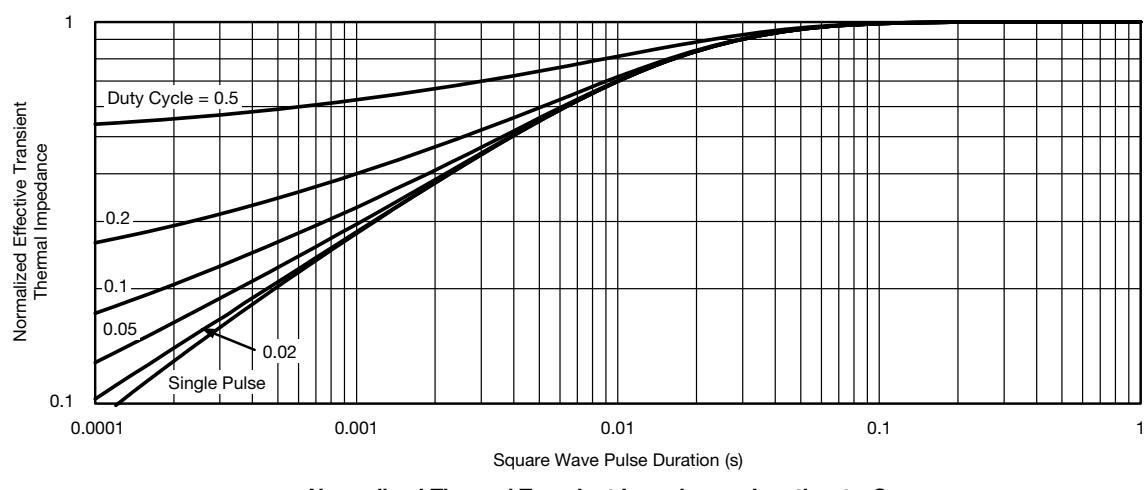
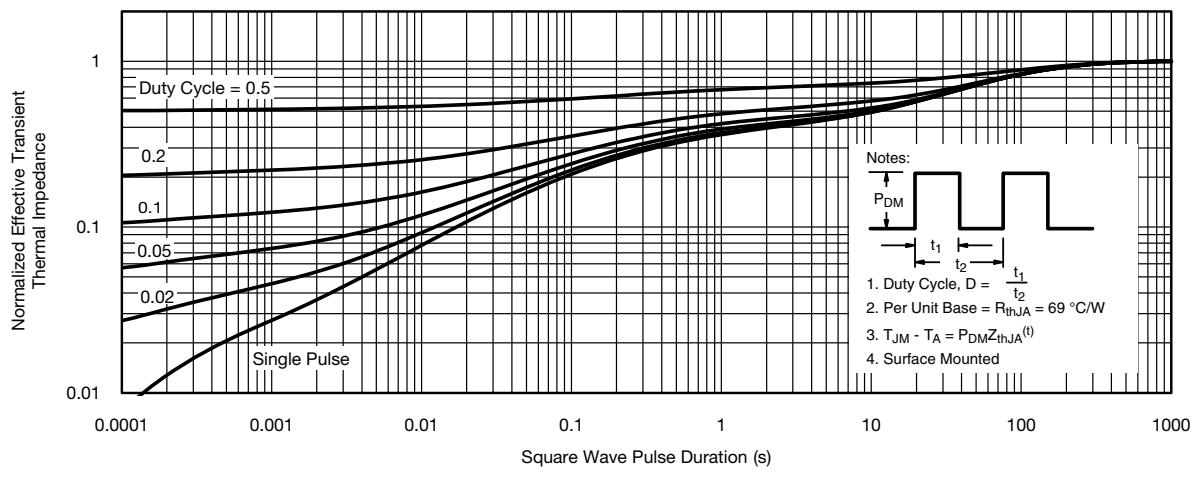
Single Pulse Power

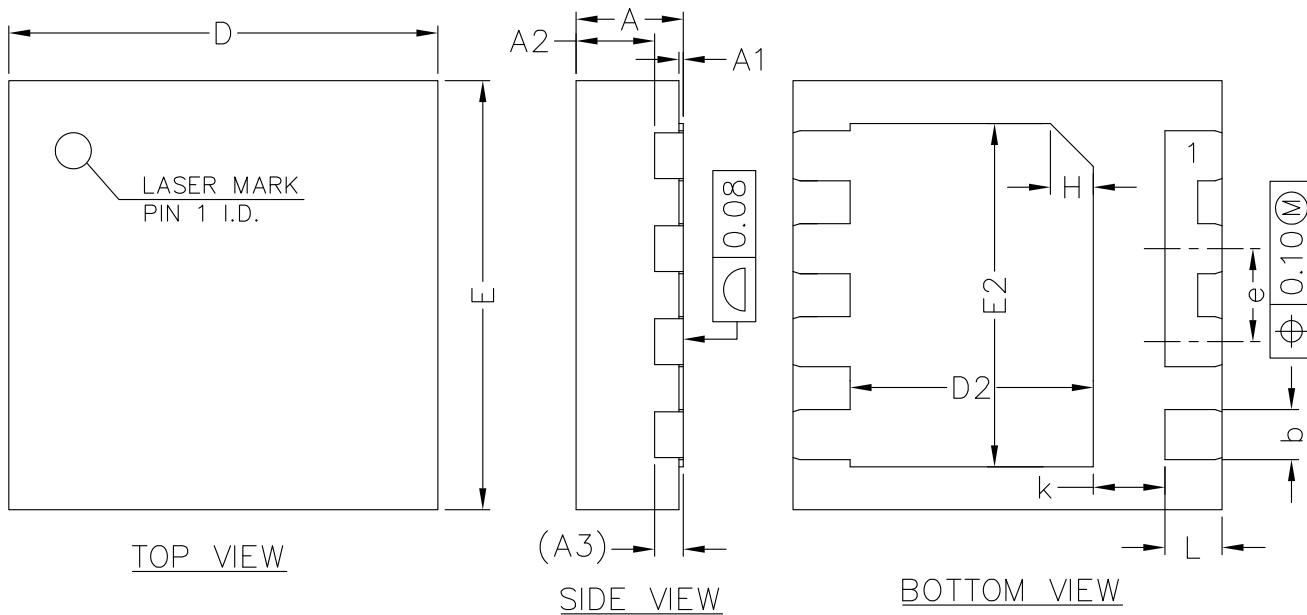


Safe Operating Area, Junction-to-Ambient

TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted
**Current Derating** ^a**Power, Junction-to-Case****Note**

- a. The power dissipation P_D is based on T_J max. = 25 °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


SIDE VIEW

COMMON DIMENSIONS
 (UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	0.70	0.75	0.80
A1	0.00	0.02	0.05
A2	0.50	0.55	0.60
A3	0.20REF		
b	0.30	0.35	0.40
D	2.90	3.00	3.10
E	2.90	3.00	3.10
D2	1.60	1.70	1.80
E2	2.30	2.40	2.50
e	0.55	0.65	0.75
K	0.40	0.50	0.60
L	0.35	0.40	0.45

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