RU1H60R

N-Channel Advanced Power MOSFET

Features

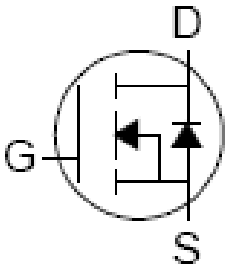
- 100V/60A,
  $R_{DS(ON)}$ =17 mΩ(Typ.)@V_{GS}=10V
  $R_{DS(ON)}$ =18.5 mΩ(Typ.)@V_{GS}=4.5V
- Super High Dense Cell Design
- Ultra Low On-Resistance
- 100% avalanche tested
- Lead Free and Green Devices Available
  (RoHS Compliant)

Applications

- Switching Applications

Pin Description

TO-220



N-Channel MOSFET

Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit
Common Ratings (T_C=25°C Unless Otherwise Noted)				
V_{DSS}	Drain-Source Voltage		100	V
V_{GSS}	Gate-Source Voltage		±20	
T_J	Maximum Junction Temperature		175	°C
T_{STG}	Storage Temperature Range		-55 to 175	°C
I_S	Diode Continuous Forward Current	T_C=25°C	60①	A
Mounted on Large Heat Sink				
I_{DP}	300μs Pulse Drain Current Tested	T_C=25°C	240②	A
I_D	Continuous Drain Current(V_{GS}=10V)	T_C=25°C	60①	A
		T_C=100°C	39	
P_D	Maximum Power Dissipation	T_C=25°C	120	W
		T_C=100°C	60	W
$R_{\theta JC}$	Thermal Resistance-Junction to Case		1.25	°C/W
Drain-Source Avalanche Ratings				
E_{AS}③	Avalanche Energy, Single Pulsed		169	mJ

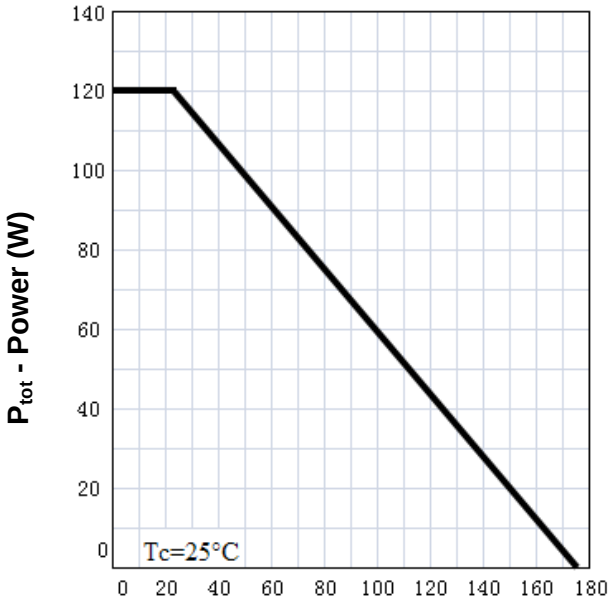
Electrical Characteristics (T_C=25°C Unless Otherwise Noted)

Symbol	Parameter	Test Condition	RU1H60R			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_{DS}=250μA	100			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=100V, V_{GS}=0V			1	μA
		T_J=85°C			30	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_{DS}=250μA	1	2	3	V
I_{GSS}	Gate Leakage Current	V_{GS}=±20V, V_{DS}=0V			±100	nA
$R_{DS(ON)}$ ④	Drain-Source On-state Resistance	V_{GS}=10V, I_{DS}=30A		17	20	mΩ
		V_{GS}=4.5V, I_{DS}=20A		18.5	25	mΩ
Diode Characteristics						
V_{SD} ④	Diode Forward Voltage	I_{SD}=30A, V_{GS}=0V			1.2	V
t_{rr}	Reverse Recovery Time	I_{SD}=30A, dI_{SD}/dt=100A/μs		47		ns
Q_{rr}	Reverse Recovery Charge			92		nC
Dynamic Characteristics ⑤						
R_G	Gate Resistance	V_{GS}=0V,V_{DS}=0V,F=1MHz		1.5		Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=50V, Frequency=1.0MHz		4050		pF
C_{oss}	Output Capacitance			760		
C_{rss}	Reverse Transfer Capacitance			190		
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=50V, R_L=1.6Ω, I_{DS}=30A, V_{GEN}=10V, R_G=4.7Ω		13		ns
t_r	Turn-on Rise Time			18		
$t_{d(OFF)}$	Turn-off Delay Time			32		
t_f	Turn-off Fall Time			50		
Gate Charge Characteristics ⑤						
Q_g	Total Gate Charge	V_{DS}=80V, V_{GS}=10V, I_{DS}=30A		52		nC
Q_{gs}	Gate-Source Charge			12		
Q_{gd}	Gate-Drain Charge			16		

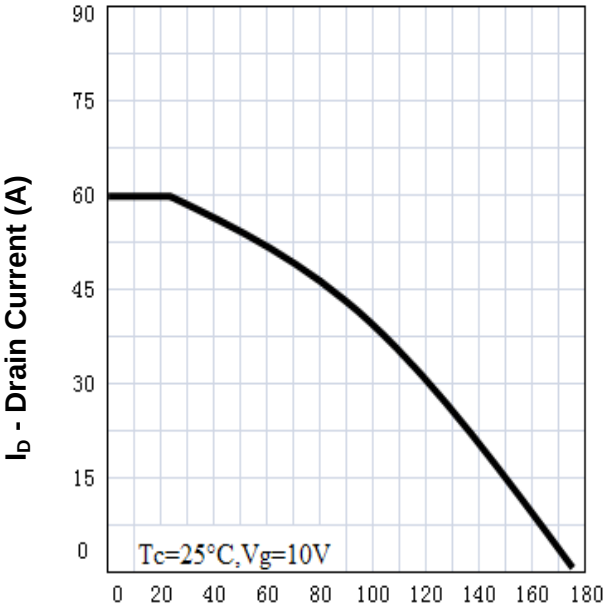
Notes: ①Calculated continuous current based on maximum allowable junction temperature.
②Pulse width limited by safe operating area.
③Limited by T_{Jmax}, I_{AS} =26A, V_{DD} = 48V, R_G = 50Ω , Starting T_J = 25°C.
④Pulse test ; Pulse width≤300μs, duty cycle≤2%.
⑤Guaranteed by design, not subject to production testing.

Typical Characteristics

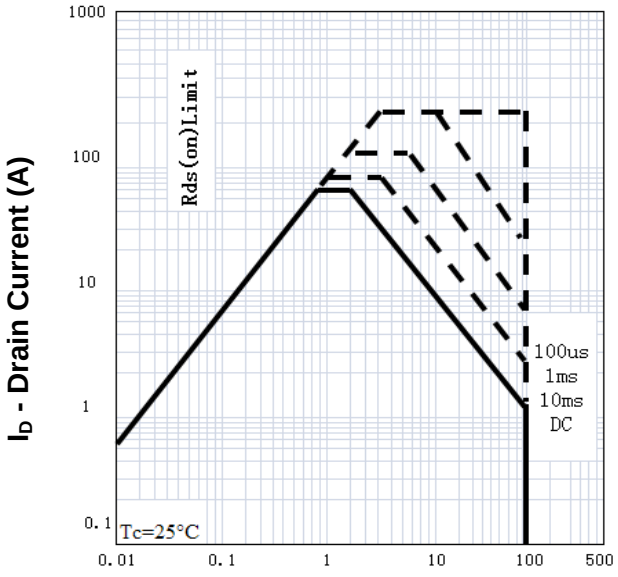
Power Dissipation



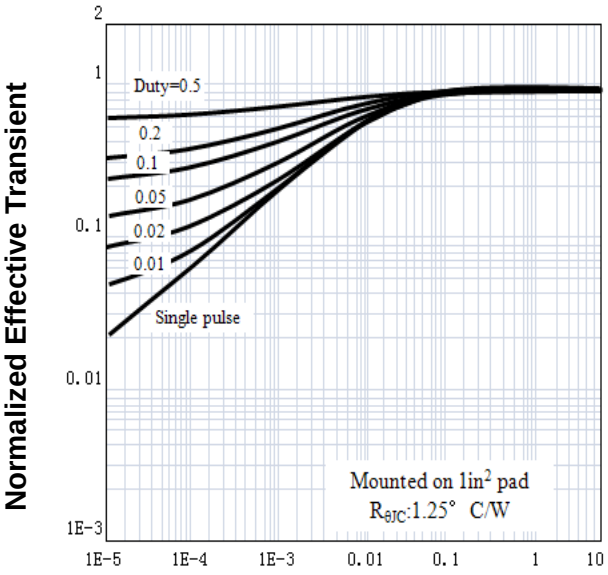
Drain Current



Safe Operation Area

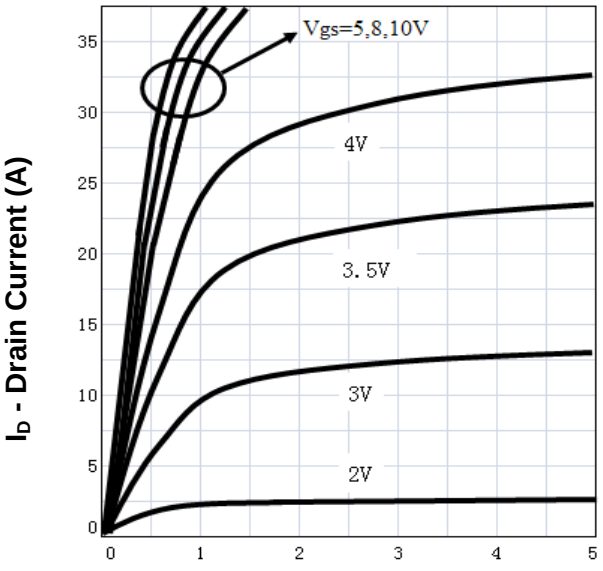


Thermal Transient Impedance



Typical Characteristics

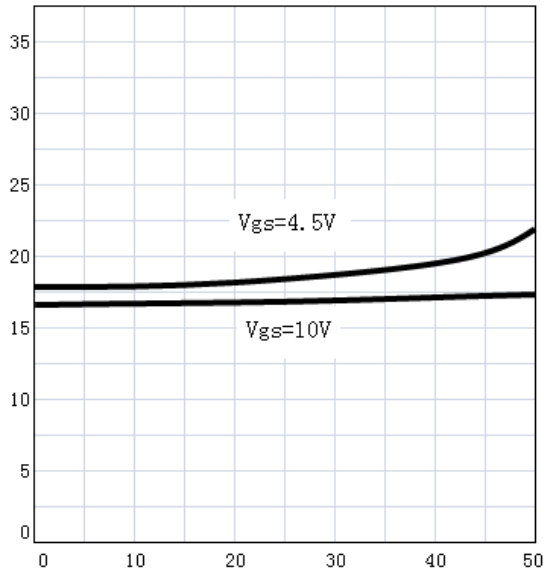
Output Characteristics



I_D - Drain Current (A)

V_{DS} - Drain-Source Voltage (V)

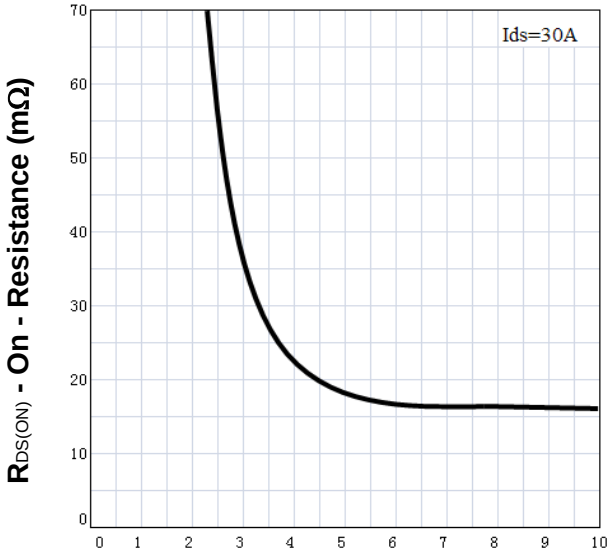
Drain-Source On Resistance



$R_{DS(ON)}$ - On Resistance (mΩ)

I_D - Drain Current (A)

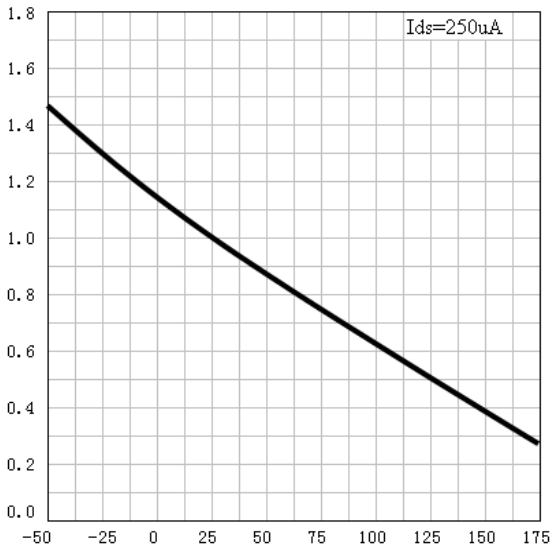
Drain-Source On Resistance



$R_{DS(ON)}$ - On - Resistance (mΩ)

V_{GS} - Gate-Source Voltage (V)

Gate Threshold Voltage

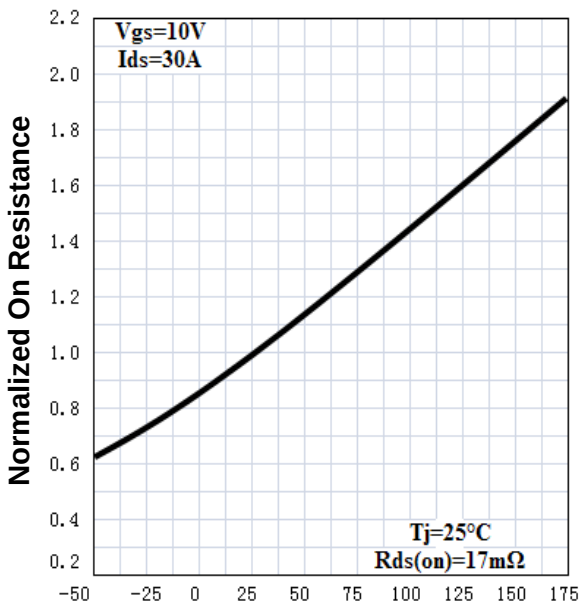


Normalized Threshold Voltage

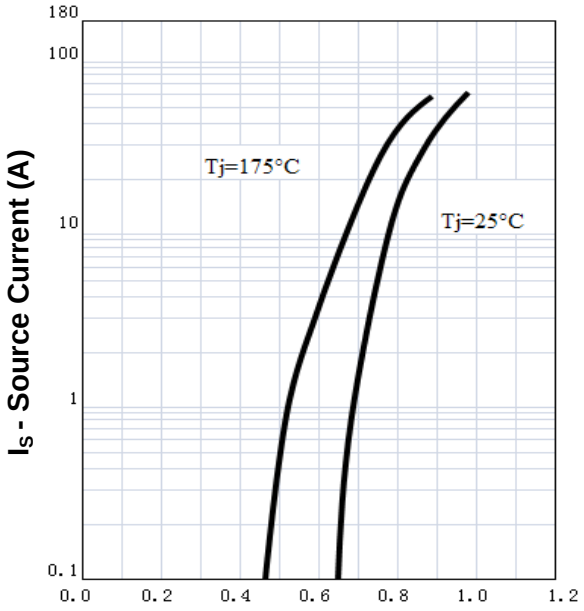
T_j - Junction Temperature (°C)

Typical Characteristics

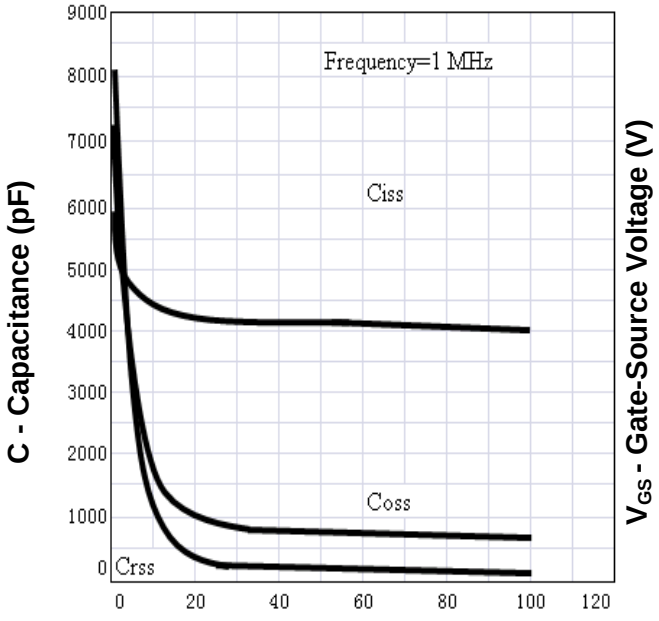
Drain-Source On Resistance



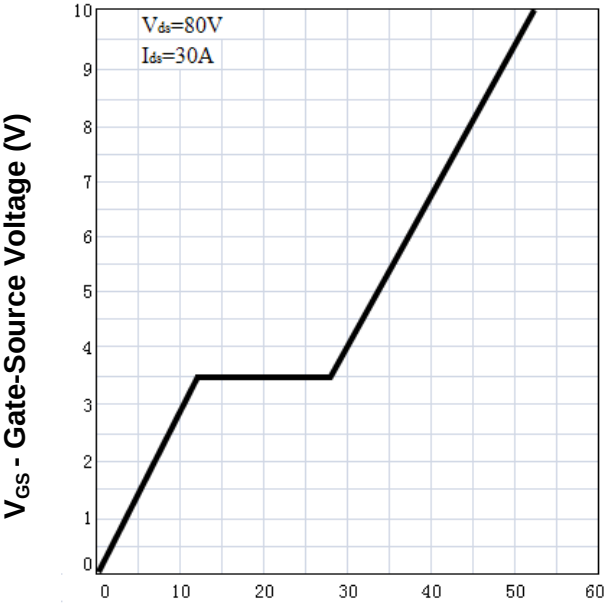
Source-Drain Diode Forward



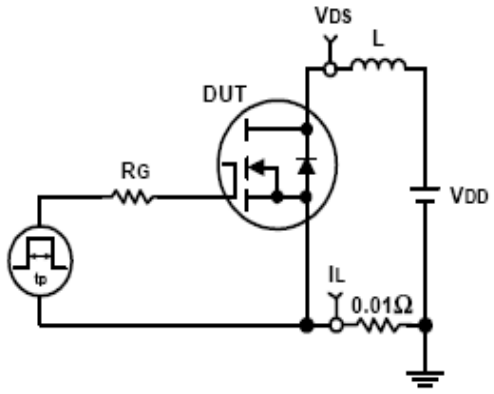
Capacitance

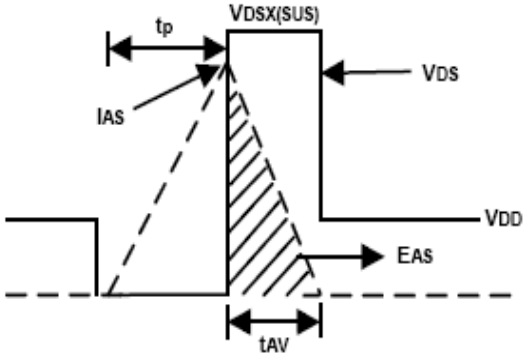


Gate Charge

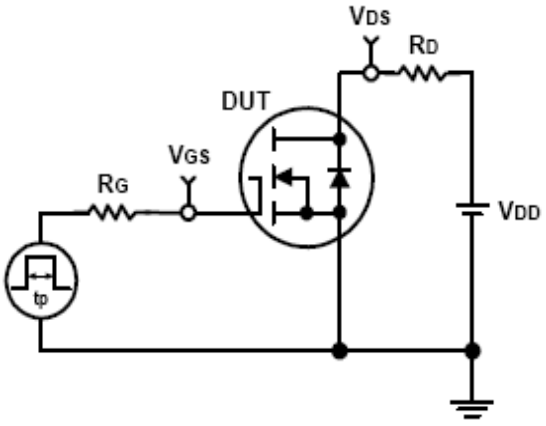


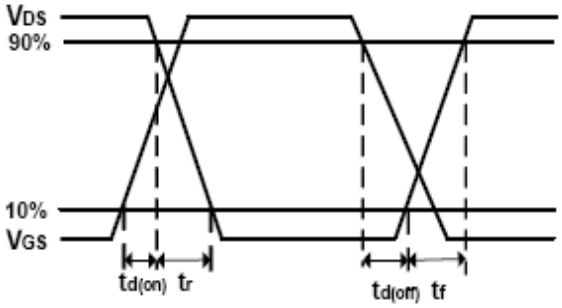
Avalanche Test Circuit and Waveforms





Switching Time Test Circuit and Waveforms



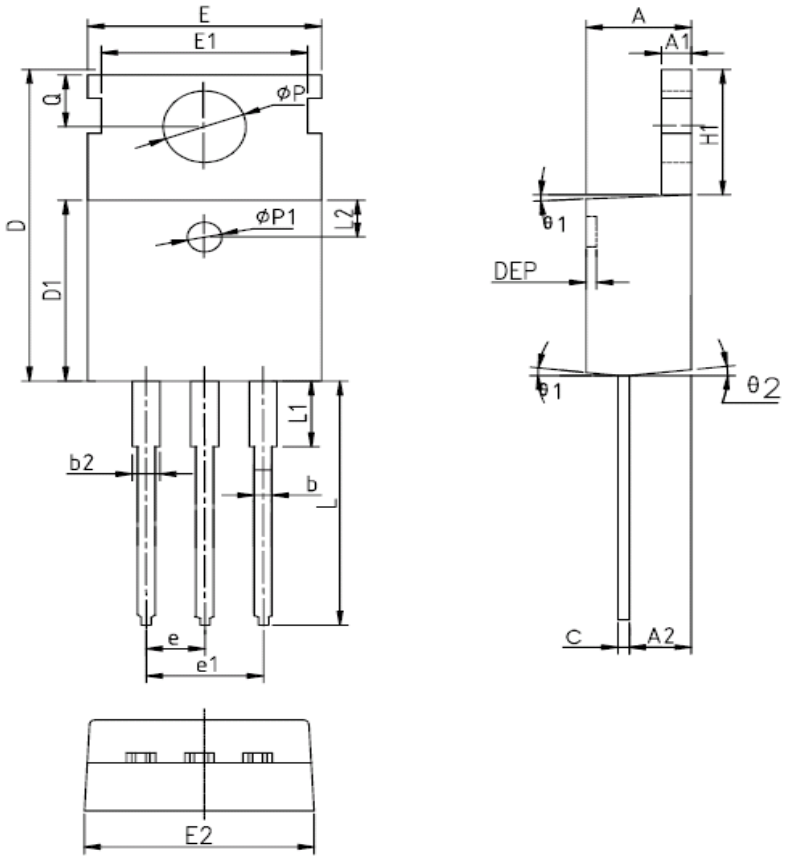


Ordering and Marking Information

Device	Marking	Package	Packaging	Quantity	Reel Size	Tape width
RU1H60R	RU1H60R	TO-220	Tube	50	-	-

Package Information

TO-220FB-3L



SYMBOL	MM			INCH			SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX		MIN	NOM	MAX	MIN	NOM	MAX
A	4.40	4.57	4.70	0.173	0.180	0.185	Øp1	1.40	1.50	1.60	0.055	0.059	0.063
A1	1.27	1.30	1.33	0.050	0.051	0.052	e	2.54BSC			0.1BSC		
A2	2.35	2.40	2.50	0.093	0.094	0.098	e1	5.08BSC			0.2BSC		
b	0.77	-	0.90	0.030	-	0.035	H1	6.40	6.50	6.60	0.252	0.256	0.260
b2	1.23	-	1.36	0.048	-	0.054	L	12.75	-	13.17	0.502	-	0.519
C	0.48	0.50	0.52	0.019	0.020	0.021	L1	-	-	3.95	-	-	0.156
D	15.40	15.60	15.80	0.606	0.614	0.622	L2	2.50REF.			0.098REF.		
D1	9.00	9.10	9.20	0.354	0.358	0.362	Øp	3.57	3.60	3.63	0.141	0.142	0.143
DEP	0.05	0.10	0.20	0.002	0.004	0.008	Q	2.73	2.80	2.87	0.107	0.110	0.113
E	9.70	9.90	10.10	0.382	0.389	0.398	θ1	5°	7°	9°	5°	7°	9°
E1	-	8.70	-	-	0.343	-	θ2	1°	3°	5°	1°	3°	5°
E2	9.80	10.00	10.20	0.386	0.394	0.401							

ALL DIMENSIONS REFER TO JEDEC STANDARD
DO NOT INCLUDE MOLD FLASH OR PROTRUSIONS

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