

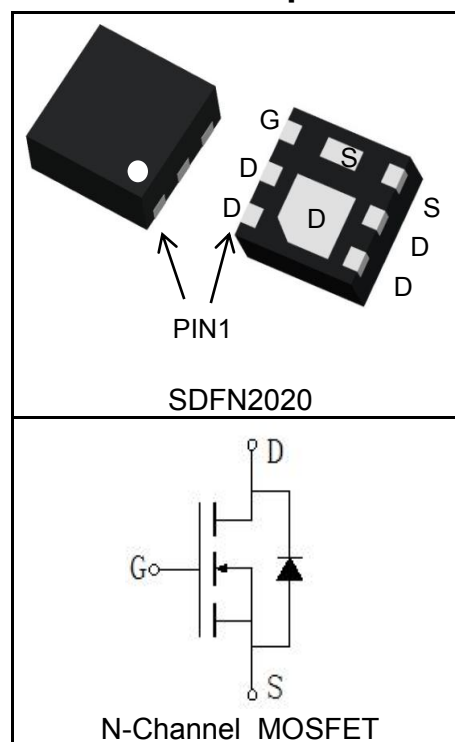
Features

- 100V/5A,
- $R_{DS(ON)} = 42m\Omega(Typ.)@V_{GS}=10V$
- $R_{DS(ON)} = 58m\Omega(Typ.)@V_{GS}=4.5V$
- Low $R_{DS(ON)}$
- Super High Dense Cell Design
- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)

Applications

- Power Management

Pin Description



Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit	
Common Ratings ($T_C=25^\circ C$ Unless Otherwise Noted)				
V_{DSS}	Drain-Source Voltage	100	V	
V_{GSS}	Gate-Source Voltage	± 20		
T_J	Maximum Junction Temperature	150	$^\circ C$	
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$	
I_S	Diode Continuous Forward Current	$T_C=25^\circ C$	5	A
Mounted on Large Heat Sink				
$I_{DP}^{①}$	300 μs Pulse Drain Current Tested	$T_C=25^\circ C$	20	A
$I_D^{②}$	Continuous Drain Current@ $T_C(V_{GS}=10V)$	$T_C=25^\circ C$	5	A
		$T_C=100^\circ C$	3.1	
	Continuous Drain Current@ $T_A(V_{GS}=10V)^{③}$	$T_A=25^\circ C$	4.6	
		$T_A=70^\circ C$	3.7	
P_D	Maximum Power Dissipation@ T_C	$T_C=25^\circ C$	14	W
		$T_C=100^\circ C$	5.5	
	Maximum Power Dissipation@ $T_A^{③}$	$T_A=25^\circ C$	2.5	
		$T_A=70^\circ C$	1.6	

Symbol	Parameter	Rating	Unit
$R_{\theta JC}$	Thermal Resistance-Junction to Case	9	°C/W
$R_{\theta JA}$ ^③	Thermal Resistance-Junction to Ambient	50	°C/W
Drain-Source Avalanche Ratings			
E_{AS} ^④	Avalanche Energy, Single Pulsed	TBD	mJ

Electrical Characteristics ($T_C=25^\circ\text{C}$ Unless Otherwise Noted)

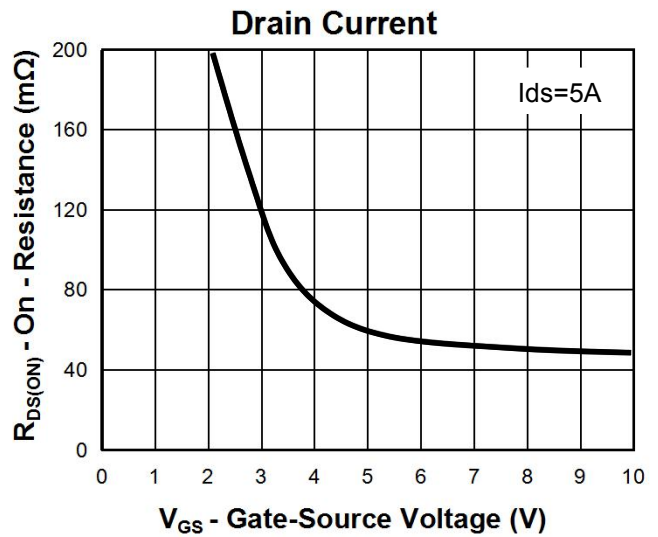
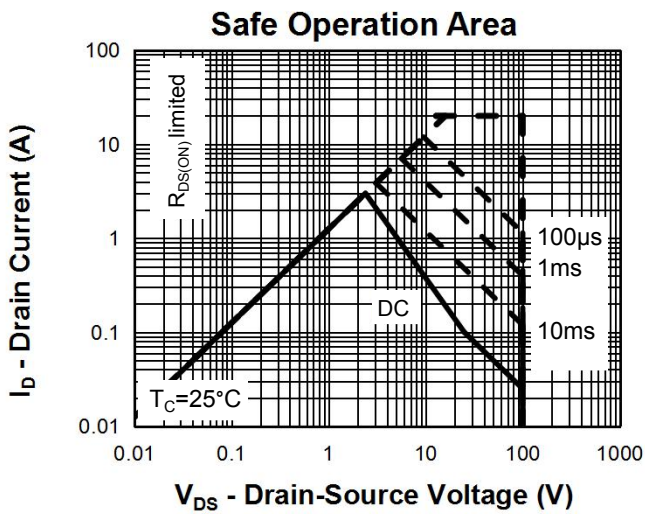
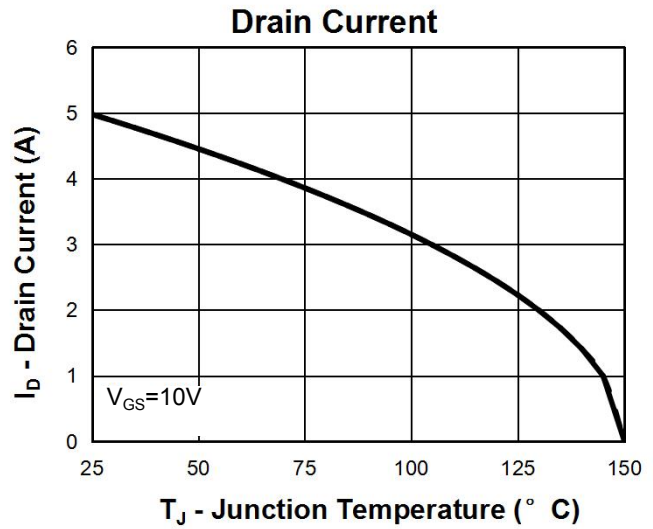
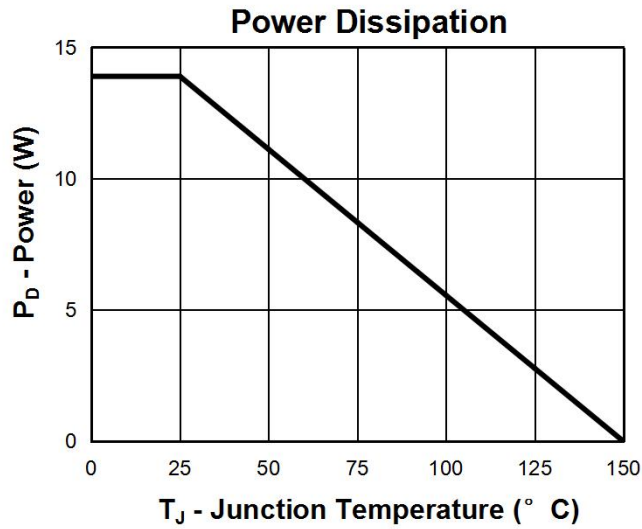
Symbol	Parameter	Test Condition	RUH1H05M4			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=250\mu A$	100			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=100V, V_{GS}=0V$			1	μA
		$T_J=125^\circ C$			30	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	1		3	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$			± 100	nA
$R_{DS(ON)}$ ^⑤	Drain-Source On-state Resistance	$V_{GS}=10V, I_{DS}=5A$		42	50	$m\Omega$
		$V_{GS}=4.5V, I_{DS}=3A$		58	70	$m\Omega$
Diode Characteristics						
V_{SD} ^⑤	Diode Forward Voltage	$I_{SD}=5A, V_{GS}=0V$			1.2	V
t_{rr}	Reverse Recovery Time	$I_{SD}=5A, di_{SD}/dt=100A/\mu s$		15		ns
Q_{rr}	Reverse Recovery Charge			8		nC
Dynamic Characteristics ^⑥						
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		390		pF
C_{oss}	Output Capacitance			105		
C_{rss}	Reverse Transfer Capacitance			15		
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=50V, I_{DS}=5A,$ $V_{GEN}=10V, R_G=4.7\Omega$		6.5		ns
t_r	Turn-on Rise Time			3		
$t_{d(OFF)}$	Turn-off Delay Time			10.5		
t_f	Turn-off Fall Time			4		
Gate Charge Characteristics ^⑥						
Q_g	Total Gate Charge	$V_{DS}=80V, V_{GS}=10V,$ $I_{DS}=5A$		7.9		nC
Q_{gs}	Gate-Source Charge			3		
Q_{gd}	Gate-Drain Charge			1.6		

- Notes:
- ①Pulse width limited by safe operating area.
 - ②Calculated continuous current based on maximum allowable junction temperature.
 - ③When mounted on 1 inch square copper board, $t \leq 10\text{sec}$.
 - ④Limited by T_{Jmax} , Starting $T_J = 25^\circ \text{C}$.
 - ⑤Pulse test;Pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.
 - ⑥Guaranteed by design, not subject to production testing.

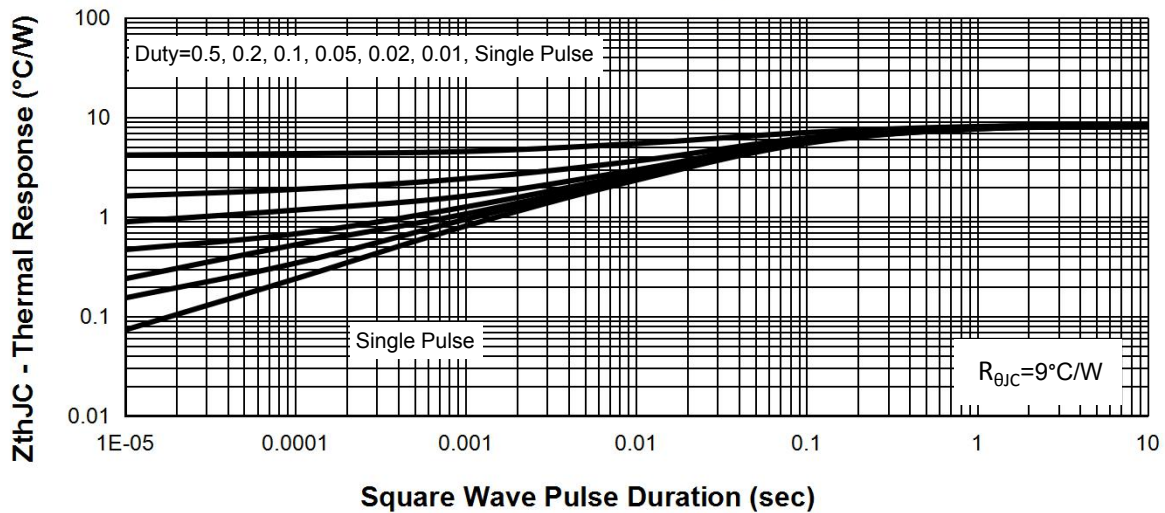
Ordering and Marking Information

Device	Marking	Package	Packaging	Quantity	Reel Size	Tape width
RUH1H05M4	RUH1H05	SDFN2020	Tape&Reel	3000	7"	8mm

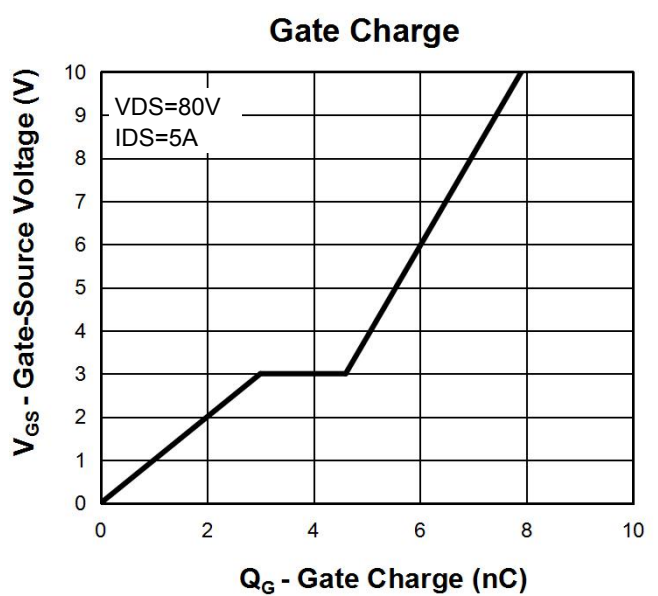
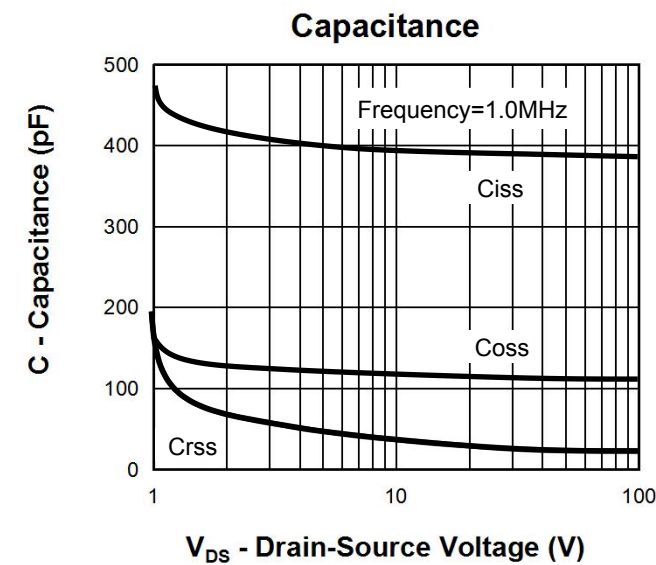
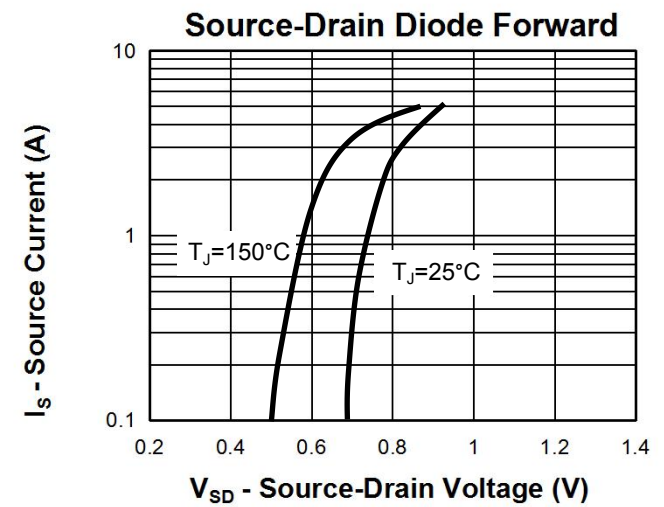
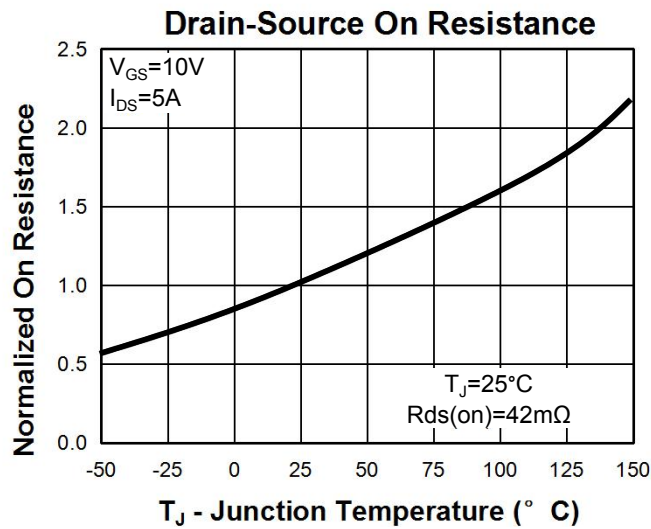
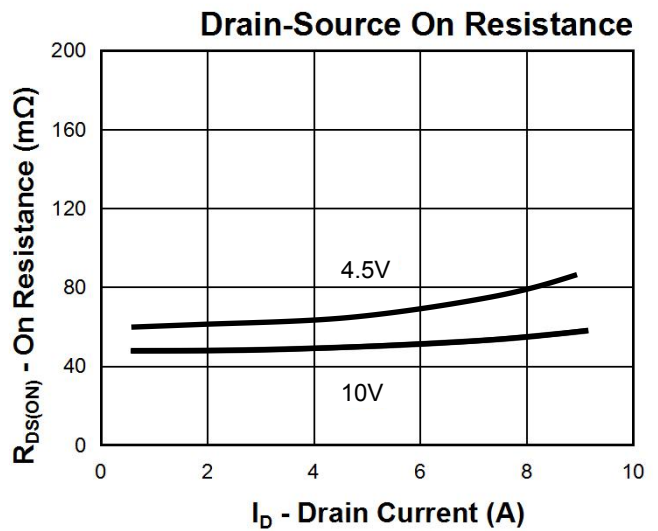
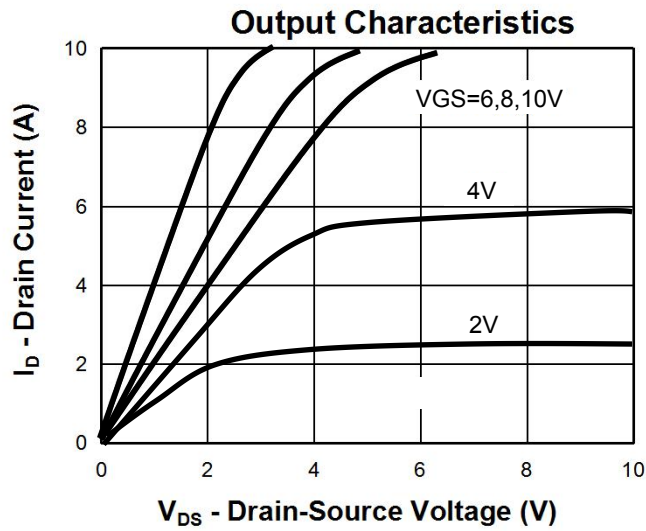
Typical Characteristics



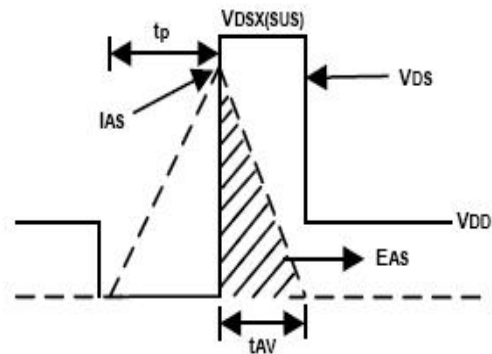
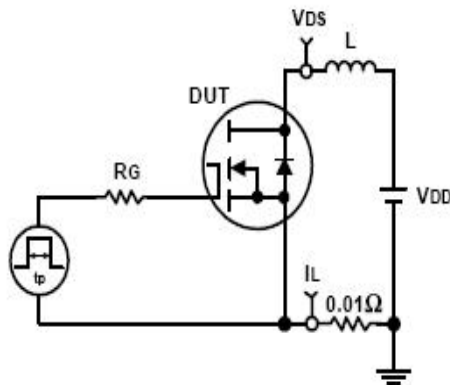
Thermal Transient Impedance



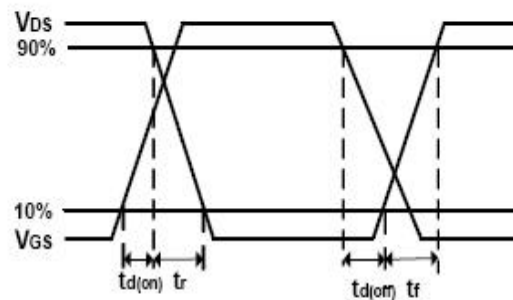
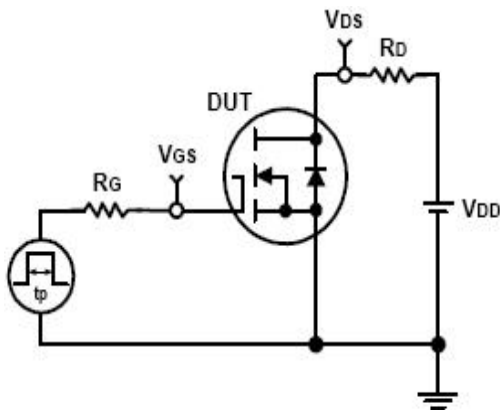
Typical Characteristics



Avalanche Test Circuit and Waveforms

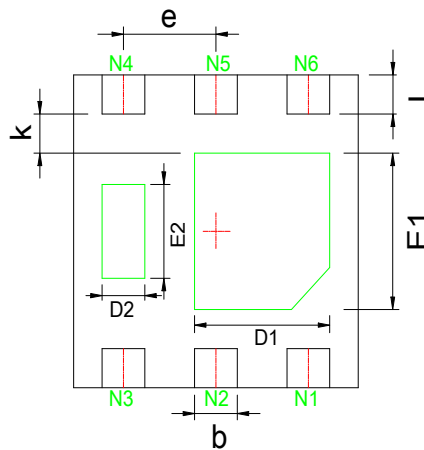
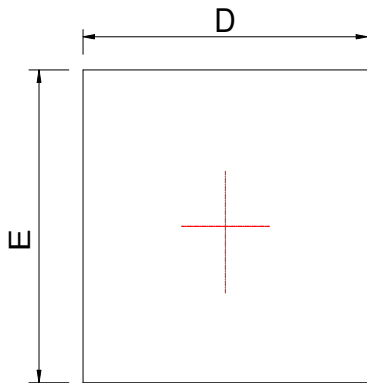


Switching Time Test Circuit and Waveforms

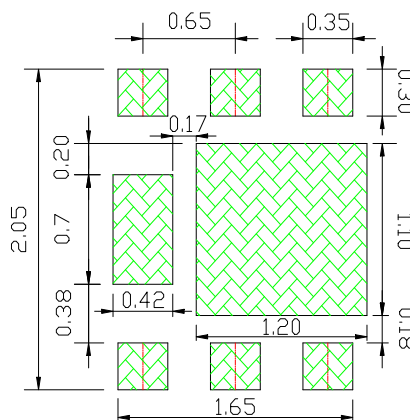
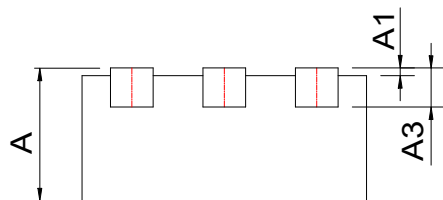


Package Information

SDFN2020



Land Pattern
(Only for Reference)



SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.700	0.750	0.800	0.028	0.030	0.031
A1	0.000	0.025	0.050	0.000	0.001	0.002
A3	0.203 REF.			0.008 REF.		
D	1.924	2.000	2.076	0.076	0.079	0.082
E	1.924	2.000	2.076	0.076	0.079	0.082
D1	0.800	0.900	1.000	0.031	0.035	0.039
E1	0.850	0.950	1.050	0.033	0.037	0.041
D2	0.200	0.300	0.400	0.008	0.012	0.016
E2	0.460	0.560	0.660	0.018	0.022	0.026
K	0.200 MIN.			0.008 MIN.		
b	0.250	0.300	0.350	0.010	0.012	0.014
e	0.650 TYP			0.026 TYP		
L	0.174	0.250	0.326	0.007	0.010	0.013