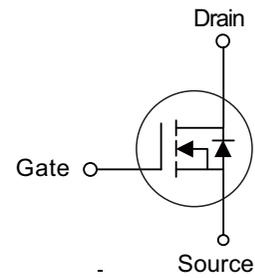


■ PRODUCT CHARACTERISTICS

Symbol	Value	Unit
V_{DSS}	20	V
$R_{DS(ON)-Typ@V_{GS}=4.5V}$	2.5	m Ω
$R_{DS(ON)-Typ@V_{GS}=2.5V}$	3.2	m Ω
I_D	75	A

Symbol

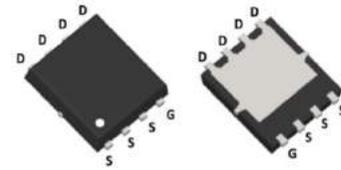


■ APPLICATIONS

- Load Switch
- PWM Application
- Power Management

■ FEATURES

- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead Free



PDFN3X3-8L

■ ORDER INFORMATION

Order codes		Package	Packing
Halogen-Free	Halogen		
N/A	MOT2135J	PDFN3X3-8L	5000Pieces/Reel

■ ABSOLUTE MAXIMUM RATINGS (@ $T_C = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Value	Unit	
Drain-to-Source Voltage	V_{DS}	20	V	
Gate-to-Source Voltage	V_{GS}	± 12	V	
Continuous Drain Current	$T_C = 25^\circ\text{C}$	I_D	75	A
	$T_C = 100^\circ\text{C}$	I_D	48	A
Pulsed Drain Current ⁽¹⁾	I_{DM}	300	A	
Single Pulsed Avalanche Energy ⁽²⁾	E_{AS}	156	mJ	
Power Dissipation	$T_C = 25^\circ\text{C}$	P_D	40	W
Thermal Resistance, Junction to Ambient ⁽³⁾	$R_{\theta JA}$	33	$^\circ\text{C/W}$	
Thermal Resistance, Junction to Case	$R_{\theta JC}$	3.1	$^\circ\text{C/W}$	
Junction & Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^\circ\text{C}$	

■ ELECTRICAL CHARACTERISTICS ($T_C=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Off characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D = 250\mu\text{A}, V_{GS} = 0\text{V}$	20	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 20\text{V}, V_{GS} = 0\text{V}$	-	-	1.0	μA
Gate-Body Leakage Current	I_{GSS}	$V_{DS} = 0\text{V}, V_{GS} = \pm 12\text{V}$	-	-	± 100	nA
On characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	0.5	0.8	1.0	V
Static Drain-Source ON-Resistance ⁽⁴⁾	$R_{DS(ON)}$	$V_{GS} = 4.5\text{V}, I_D = 30\text{A}$	-	2.5	3.5	$\text{m}\Omega$
		$V_{GS} = 2.5\text{V}, I_D = 20\text{A}$	-	3.2	4.5	$\text{m}\Omega$
Dynamic characteristics						
Input Capacitance	C_{iss}	$V_{GS} = 0\text{V}, V_{DS} = 10\text{V}, f = 1\text{MHz}$	-	3476	-	pF
Output Capacitance	C_{oss}		-	528	-	pF
Reverse Transfer Capacitance	C_{rss}		-	464	-	pF
Total Gate Charge	Q_g	$V_{GS} = 0 \text{ to } 8\text{V}$ $V_{DS} = 10\text{V}, I_D = 30\text{A}$	-	65	-	nC
Gate Source Charge	Q_{gs}		-	8	-	nC
Gate Drain("Miller") Charge	Q_{gd}		-	12	-	nC
Switching characteristics						
Turn-On DelayTime	$t_{d(on)}$	$V_{GS} = 10\text{V}, V_{DD} = 10\text{V}$ $I_D = 30\text{A}, R_{GEN} = 3\Omega$	-	8	-	ns
Turn-On Rise Time	t_r		-	19	-	ns
Turn-Off DelayTime	$t_{d(off)}$		-	73	-	ns
Turn-Off Fall Time	t_f		-	80	-	ns
Drain-source diode characteristics and max ratings						
Drain to Source Diode Forward Current	I_S		-	-	75	A
Drain to Source Diode Forward Current	I_{SM}		-	-	300	A
Drain to Source Diode Forward Voltage	V_{SD}	$V_{GS} = 0\text{V}, I_S = 30\text{A}$	-	-	1.2	V
Body Diode Reverse Recovery Time	t_{rr}	$I_F = 20\text{A}, di/dt = 100\text{A/us}$	-	16	-	ns
Body Diode Reverse Recovery Charge	Q_{rr}		-	5.6	-	nC

- Notes:
1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
 2. E_{AS} condition: Starting $T_J=25^\circ\text{C}$, $V_{DD}=10\text{V}$, $V_G=10\text{V}$, $R_G=25\text{ohm}$, $L=0.5\text{mH}$, $I_{AS}=25\text{A}$
 3. $R_{\theta JA}$ is measured with the device mounted on a 1inch^2 pad of 2oz copper FR4 PCB
 4. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 0.5\%$.

■ TYPICAL CHARACTERISTICS

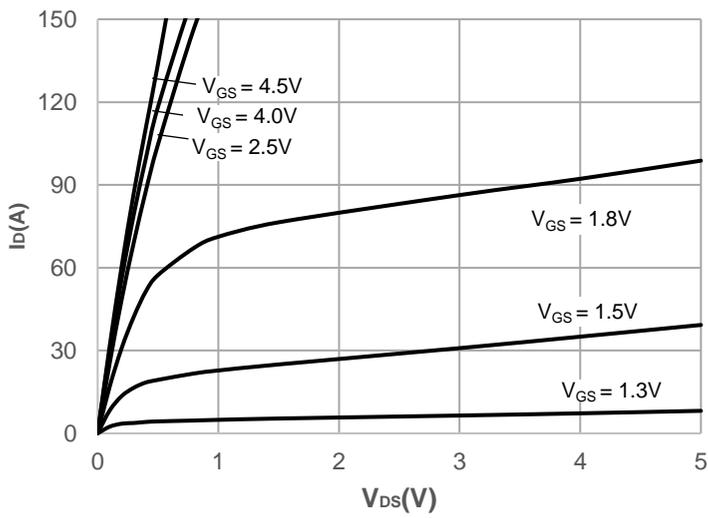


Figure 1: Output Characteristics

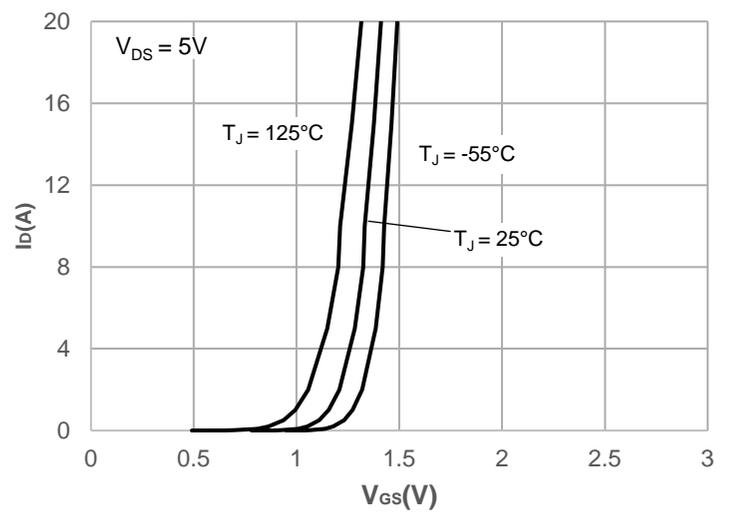


Figure 2: Typical Transfer Characteristics

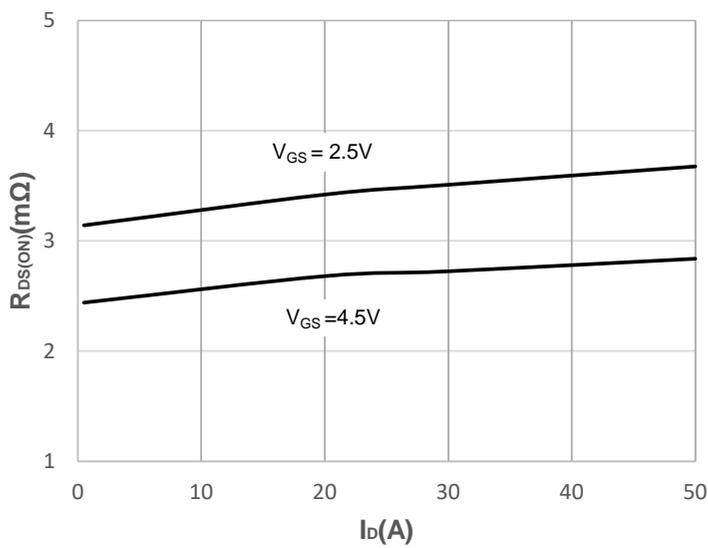


Figure 3: On-resistance vs. Drain Current

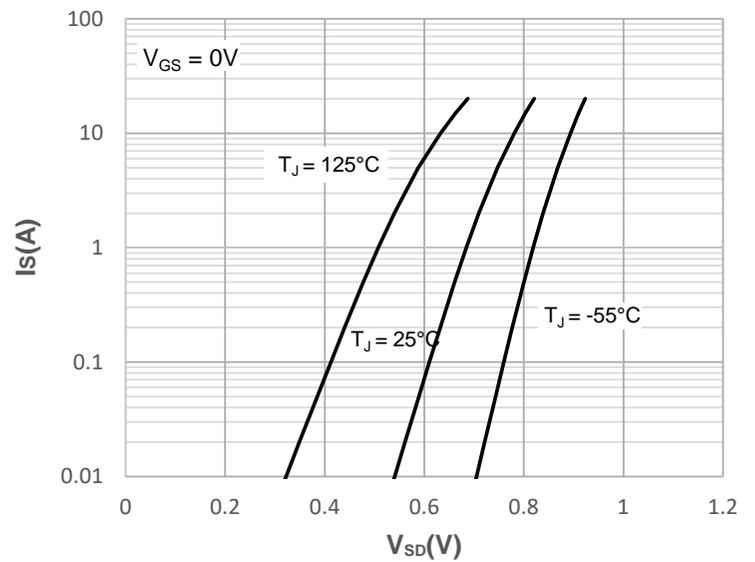


Figure 4: Body Diode Characteristics

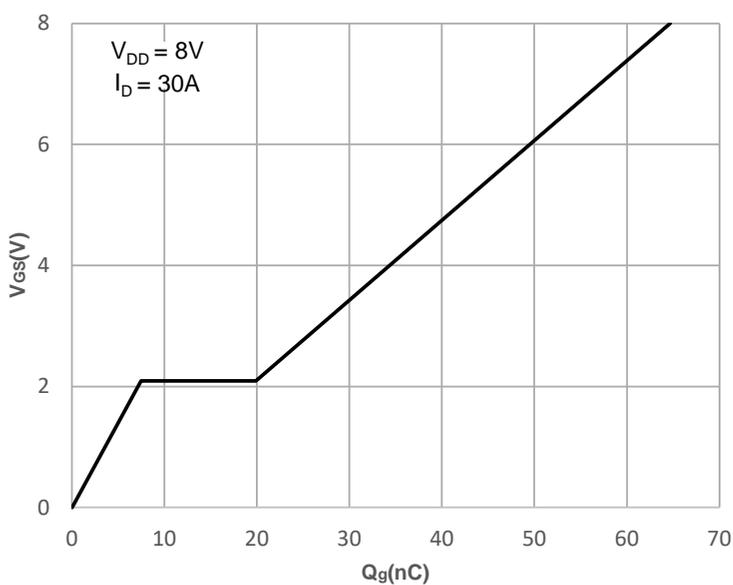


Figure 5: Gate Charge Characteristics

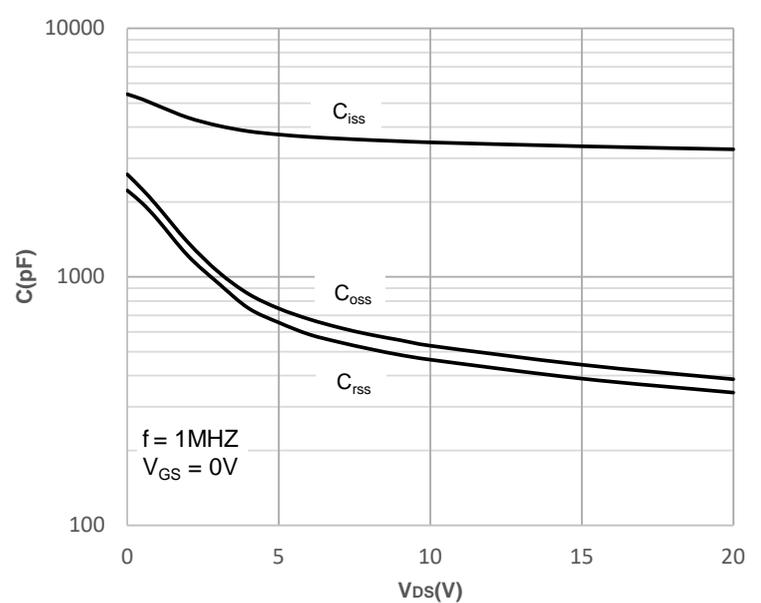


Figure 6: Capacitance Characteristics

■ TYPICAL CHARACTERISTICS(Cont.)

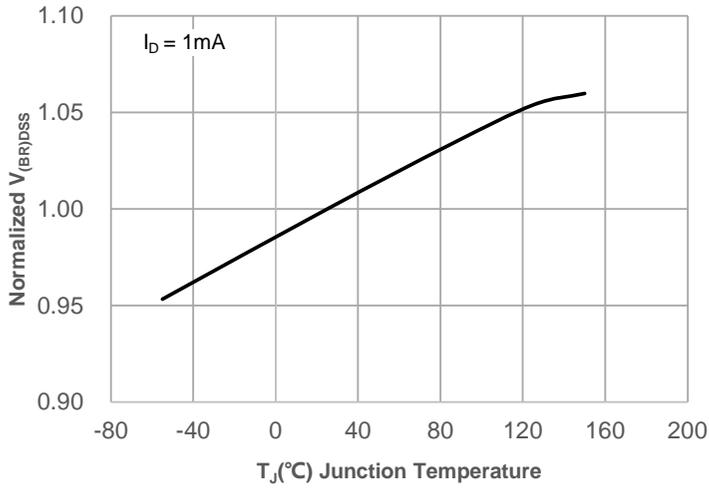


Figure 7: Normalized Breakdown voltage vs. Junction Temperature

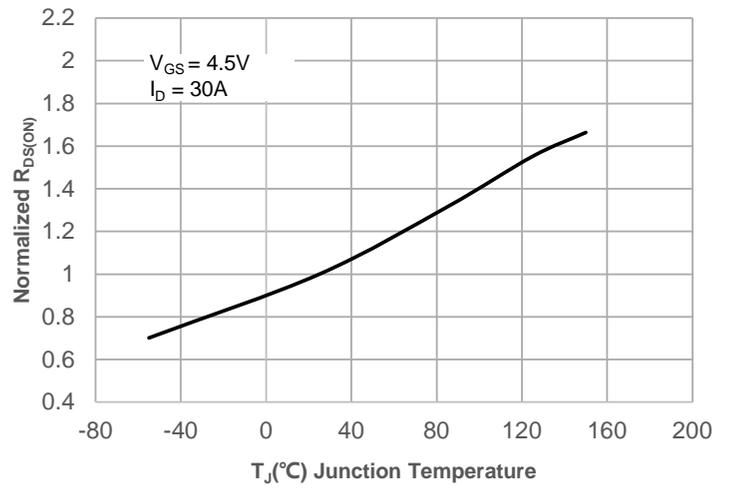


Figure 8: Normalized on Resistance vs. Junction Temperature

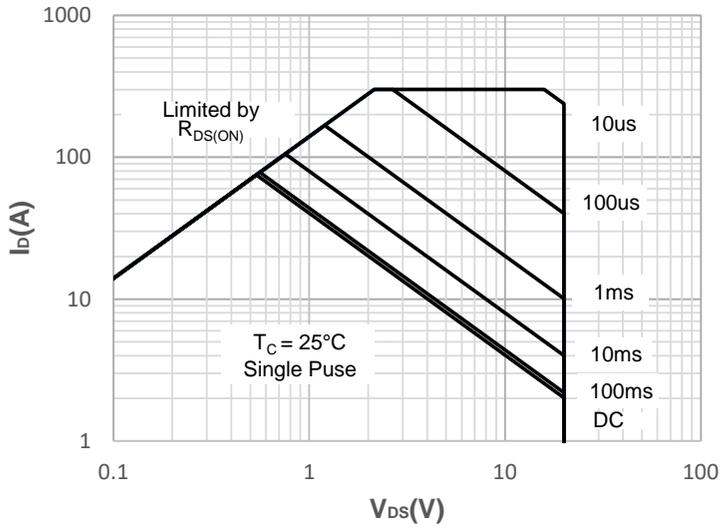


Figure 9: Maximum Safe Operating Area

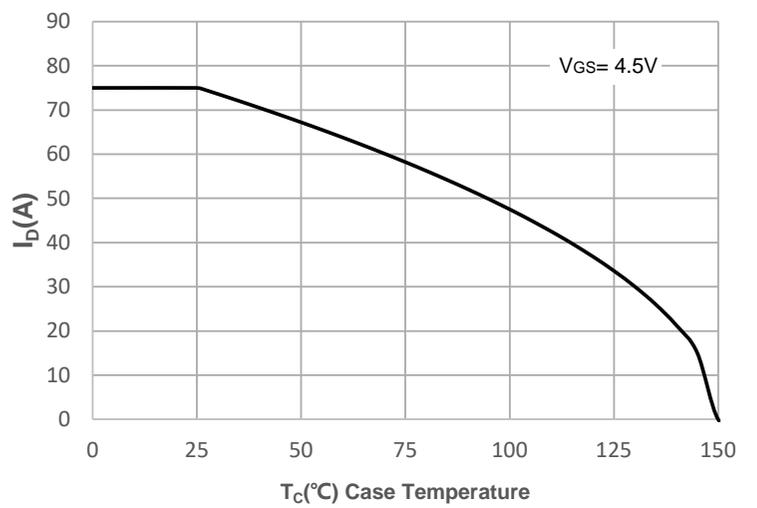


Figure 10: Maximum Continuous Drian Current vs. Case Temperature

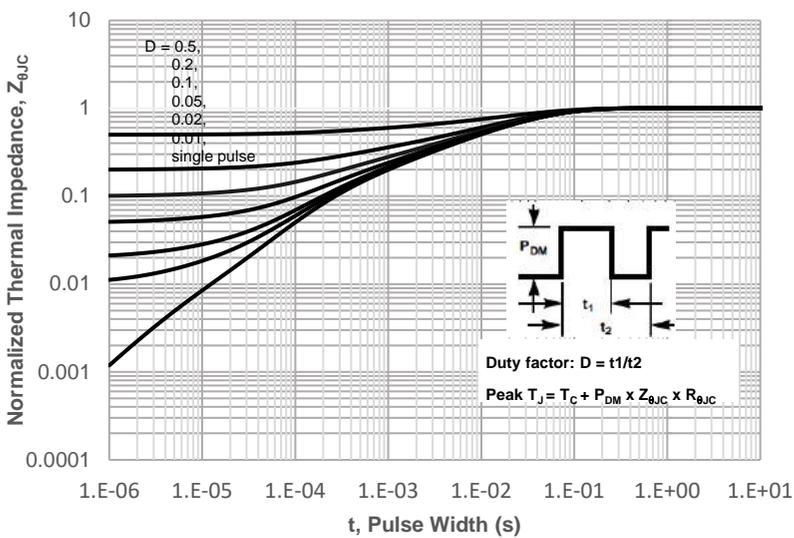


Figure 11: Normalized Maximum Transient Thermal Impedance

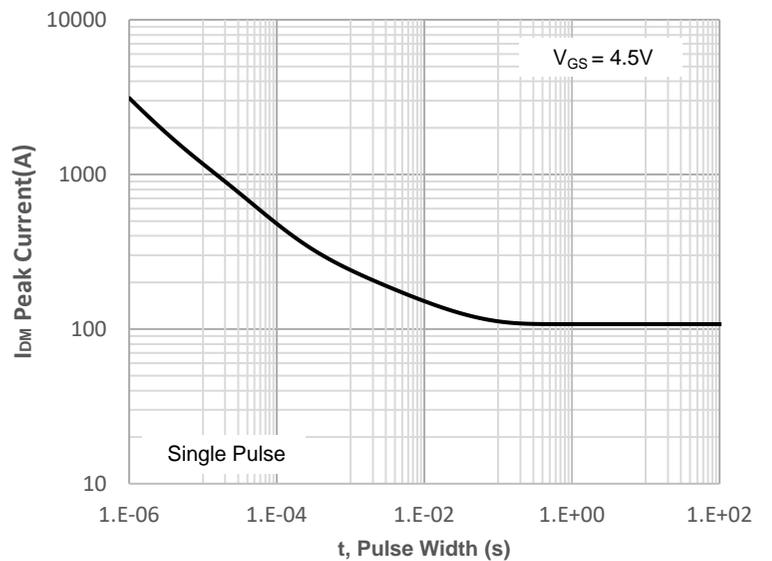
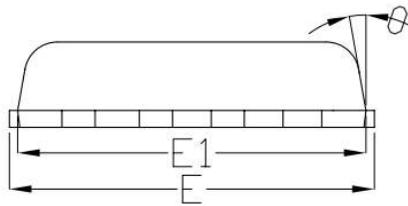
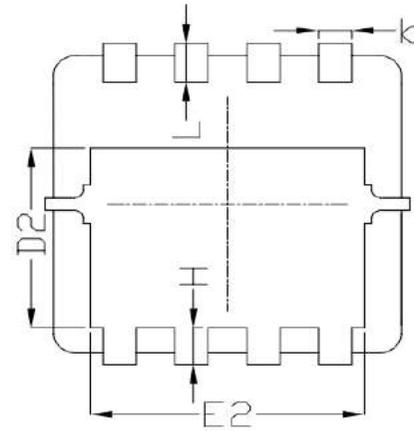
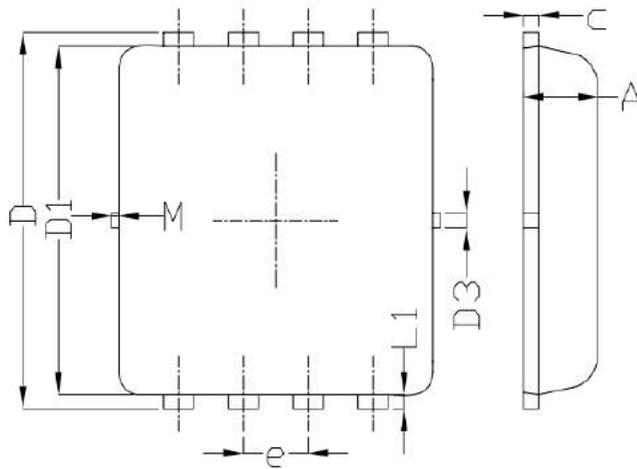
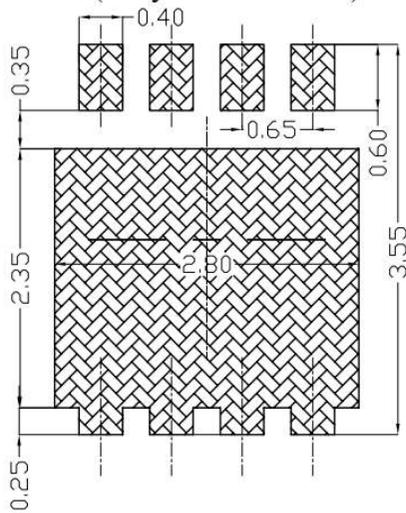


Figure 12: Peak Current Capacity

■ PDFN3333-8L Package Mechanical Data



Land Pattern
(Only for Reference)



SYMBOL	DIMENSIONAL REQMTS		
	MIN	NOM	MAX
A	0.70	0.75	0.80
b	0.25	0.30	0.35
c	0.10	0.15	0.25
D	3.25	3.35	3.45
D1	3.00	3.10	3.20
D2	1.78	1.88	1.98
D3	---	0.13	---
E	3.20	3.30	3.40
E1	3.00	3.15	3.20
E2	2.39	2.49	2.59
e	0.65BSC		
H	0.30	0.39	0.50
L	0.30	0.40	0.50
L1	---	0.13	---
θ	---	10°	12°
M	*	*	0.15
* Not specified			

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