

$V_{RM} = 150\text{ V}$, $I_{F(AV)} = 45\text{ A}$
Schottky Diode
SZ-E10ET415

Description

The SZ-E10ET415 is a 150 V, 45 A Schottky diode for automotive applications. The product achieves characteristics such as low leakage current and low forward voltage drop, thus providing a high-efficient rectification circuit. Its low thermal resistance package has excellent performance in heat dissipation.

Features

- V_{RM} ----- 150 V
- $I_{F(AV)}$ ----- 45 A
- V_F ($I_F = 45\text{ A}$)----- 0.98 V (typ.)
- $H \cdot I_R$ ($T_J = 150\text{ }^\circ\text{C}$)----- 35 mA (max.)
- Avalanche Power----- 2.5 kW
- Bare Lead Frame: Pb-free (RoHS Compliant)
- Flammability: Equivalent to UL94V-0
- Suitable for High Reliability and Automotive Requirements
- Anode Heatsink Package

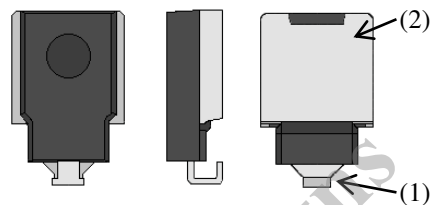
Applications

High speed switching applications such as:

- DC/DC Converter
- Adapter
- Secondary Rectifier Circuit

Package

SZ-E10



Not to scale

Not Recommended for New Designs

SZ-E10ET415

Absolute Maximum Ratings

Unless specifically noted, $T_A = 25\text{ }^\circ\text{C}$.

Parameter	Symbol	Conditions	Rating	Unit
Repetitive Peak Reverse Voltage	V_{RM}		150	V
Average Forward Current	$I_{F(AV)}$	$t/T \geq 1/4$, see Figure 3 and Figure 4.	45	A
Surge Forward Current	I_{FSM}	Half cycle sine wave, positive side, 10 ms, 1 shot	300	A
Avalanche Power ⁽¹⁾	P_A	$T_J = 150\text{ }^\circ\text{C}$; $t_p = 0.5\text{ }\mu\text{s}$ (see Figure 1), 1 shot	2.5	kW
Junction Temperature	T_J		-55 to 150	$^\circ\text{C}$
Storage Temperature	T_{STG}		-55 to 150	$^\circ\text{C}$

Electrical Characteristics

Unless specifically noted, $T_A = 25\text{ }^\circ\text{C}$.

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Forward Voltage Drop	V_F	$I_F = 45\text{ A}$	—	0.98	1.10	V
Reverse Leakage Current	I_R	$V_R = V_{RM}$	—	3	30	μA
Reverse Leakage Current under High Temperature	$H \cdot I_R$	$V_R = V_{RM}$, $T_J = 150\text{ }^\circ\text{C}$	—	20	35	mA
Thermal Resistance ⁽²⁾	$R_{th(J-L)}$		—	0.35	0.55	$^\circ\text{C/W}$

Mechanical Characteristics

Parameter	Conditions	Min.	Typ.	Max.	Unit
Package Weight		—	2.6	—	g

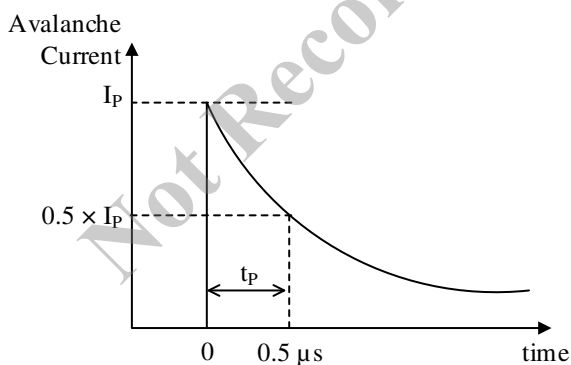


Figure 1. Definition of Pulse Width, t_p

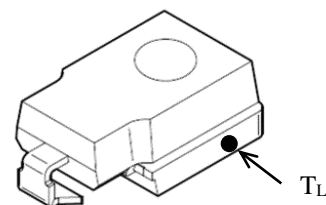


Figure 2. Lead Temperature Measurement Point

⁽¹⁾ Allowed to be applied to the device up to 2 million times.

⁽²⁾ Refers to thermal resistance between junction and lead with infinite heatsink. Lead temperature is measured at anode lead (see Figure 2).

Derating Curves

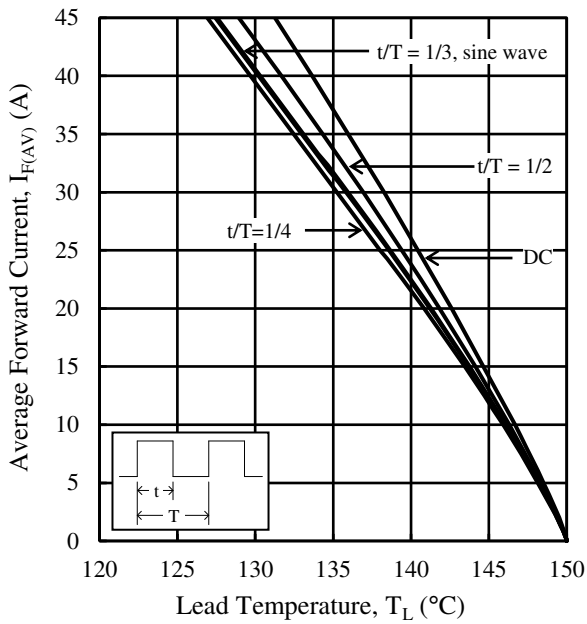


Figure 3. $I_{F(AV)}$ vs. T_L
 ($T_J = 150\text{ }^\circ\text{C}$, $V_R = 0\text{ V}$, $R_{th(J-L)} = 0.55\text{ }^\circ\text{C/W}$)

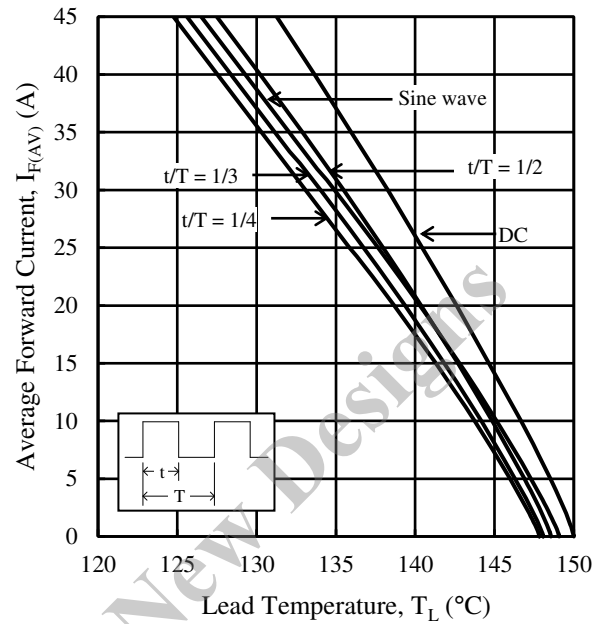


Figure 4. $I_{F(AV)}$ vs. T_L
 ($T_J = 150\text{ }^\circ\text{C}$, $V_R = 150\text{ V}$, $R_{th(J-L)} = 0.55\text{ }^\circ\text{C/W}$)

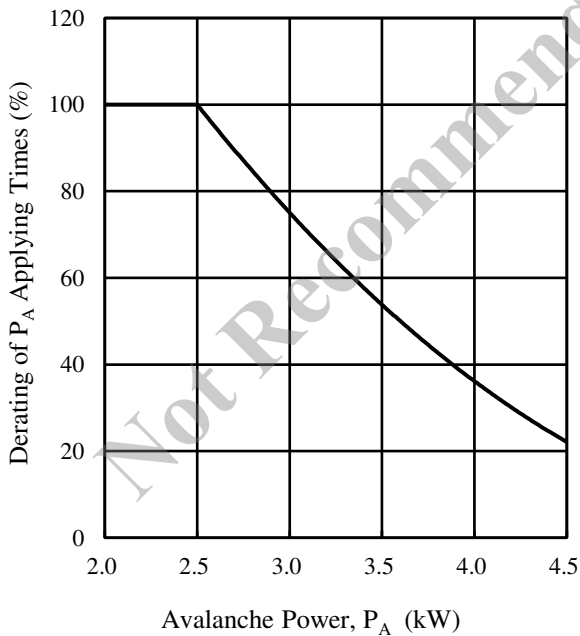


Figure 5. Derating of P_A Applying Times vs. P_A
 ($t_p = 0.5\text{ }\mu\text{s}$)

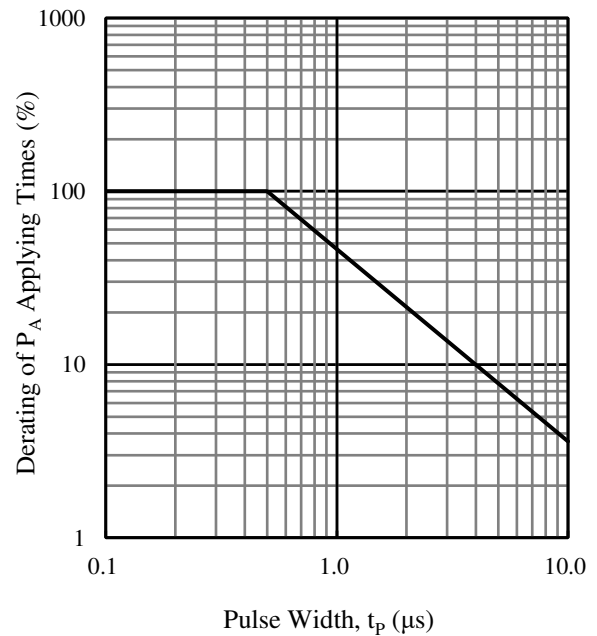


Figure 6. Derating of P_A Applying Times vs. $t_p^{(3)}$
 ($T_J = 150\text{ }^\circ\text{C}$)

⁽³⁾ See Figure 1.

Characteristic Curves

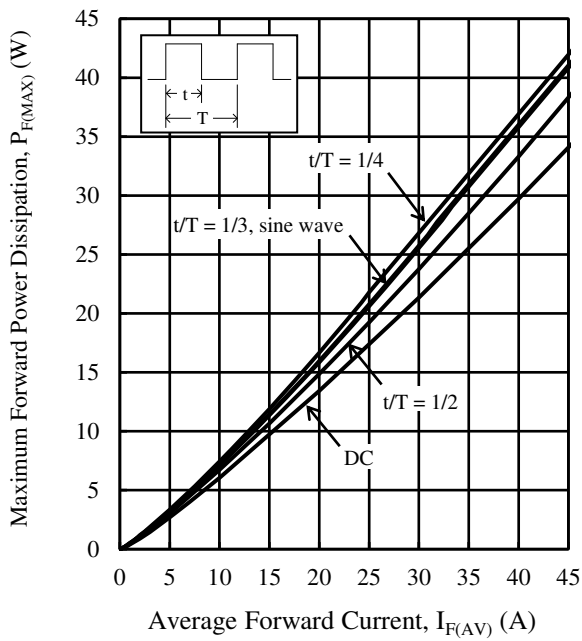


Figure 7. $P_{F(MAX)}$ vs. $I_{F(AV)}$ ($T_J = 150\text{ }^\circ\text{C}$)

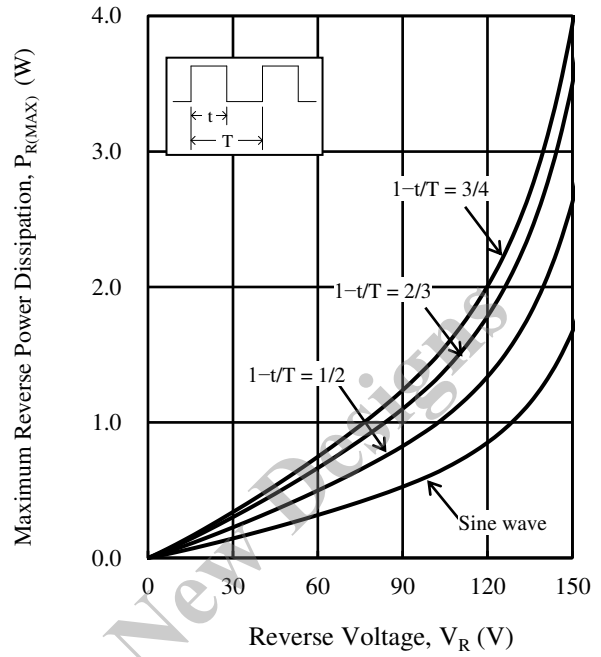


Figure 8. $P_{R(MAX)}$ vs. V_R ($T_J = 150\text{ }^\circ\text{C}$)

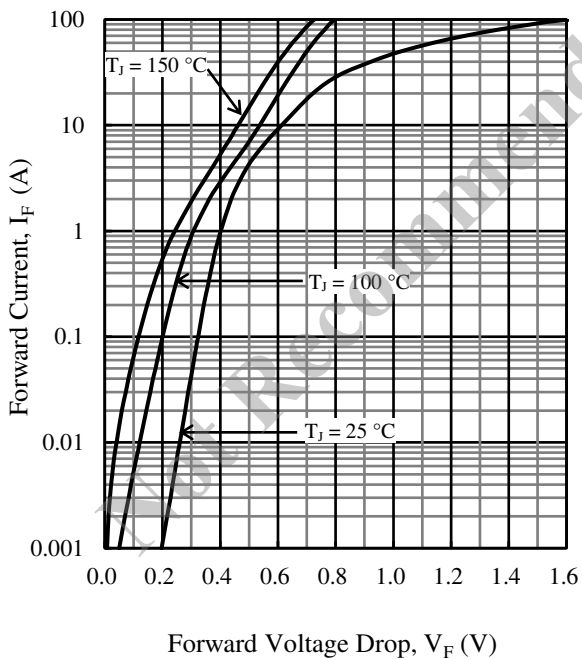


Figure 9. Typical Characteristics: I_F vs. V_F

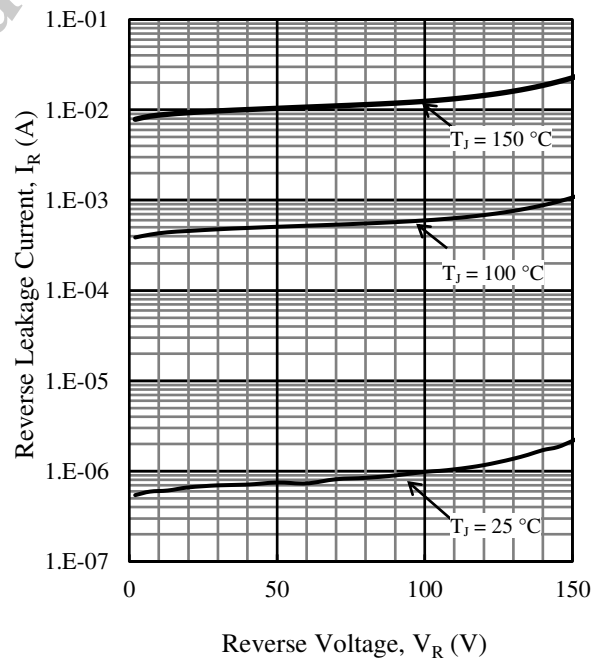


Figure 10. Typical Characteristics: I_R vs. V_R

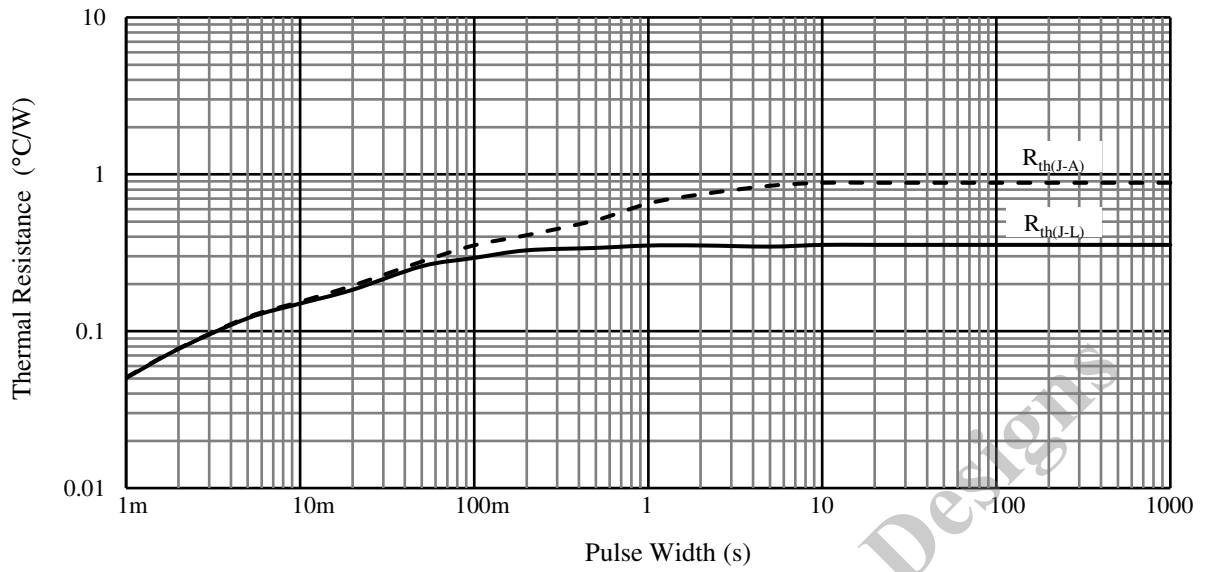


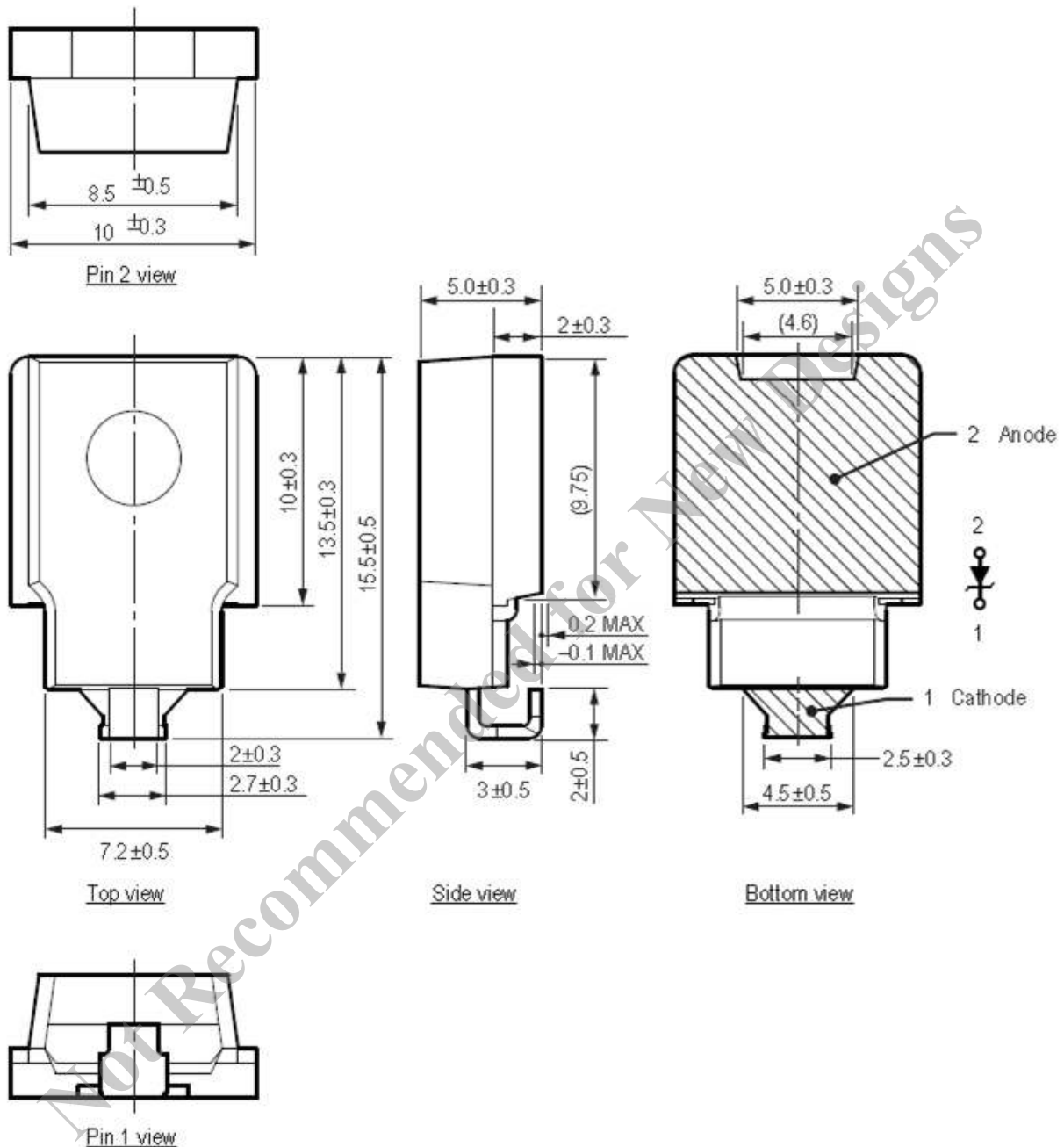
Figure 11. Typical Transient Thermal Resistance Characteristics

Not Recommended for New Designs

SZ-E10ET415

Physical Dimensions

- SZ-E10 Package

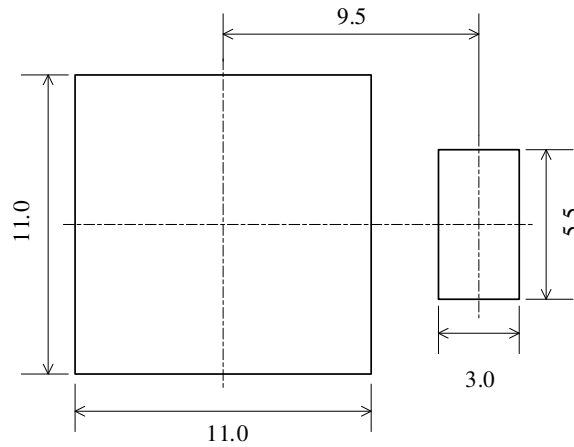


NOTES:

- Dimensions in millimeters
- Bare lead frame: Pb-free (RoHS compliant)
- Moisture Sensitivity Level 3 (MSL 3)
- When soldering the products, it is required to minimize the working time within the following limits:
Reflow:
 - Preheat: $150\text{ }^{\circ}\text{C}$ to $200\text{ }^{\circ}\text{C}$ / 60 s to 120 s
 - Solder heating: $240\text{ }^{\circ}\text{C}$ / 30s, 3 times ($245\text{ }^{\circ}\text{C}$ peak)
- Soldering Iron: $350\text{ }^{\circ}\text{C}$ / 3.5 s, 1 time

SZ-E10ET415

• SZ-E10 Land Pattern Example



NOTE:

- Dimensions in millimeters

Marking Diagram

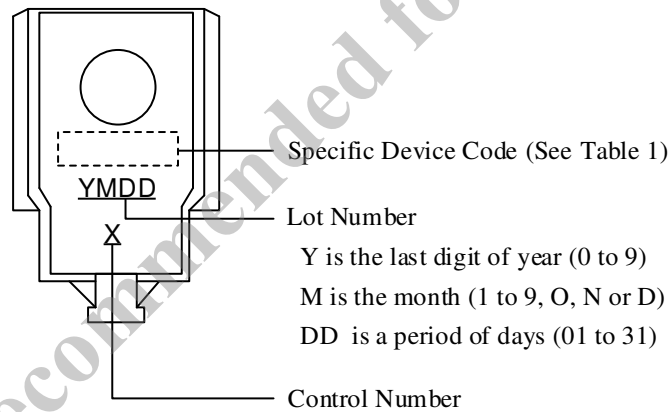


Table 1. Specific Device Code

Specific Device Code	Part Number
ET415	SZ-E10ET415

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