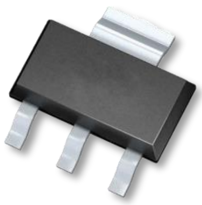


CET05N10SL

100V ▲ 98mΩ ▲ 3.5A ▲ Si MOSFET

SILICON Si MOSFET ▲ SMD type
N-channel enhancement mode
UL94V-0 rated flame retardant epoxy
SOT223 package ▲ MSL 3
Super high dense cell density for extremely low $R_{DS(ON)}$
Rugged and reliable

MAXIMUM RATINGS

Parameter (T_A = 25°C, unless otherwise noted)		Characteristics
Drain-Source Voltage	V_{DS}	100V
Gate-Source Voltage	V_{GS}	±16V
Continuous Drain Current	I_D	3.5A
Pulsed Drain Current Note 1	I_{DM}	14A
Maximum Power Dissipation	P_D	3W
Operating and Storage Temperature Range	T_J, T_{STG}	-55°C to +150°C

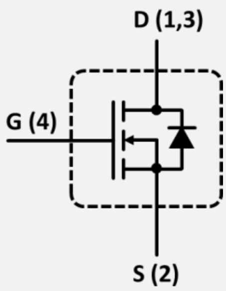
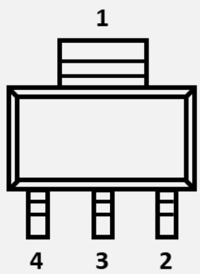
THERMAL CHARACTERISTICS

Parameter	Symbol	Limit
Thermal Resistance, Junction-to-Case Note 2	R_{TH_JC}	42°C/W

APPLICATIONS

Battery Management Systems	E-Bike	Industrial Control	Power Inverter	UPS

PIN DESCRIPTION

Circuit Diagram	Outline ▪ Top View	Pin No.	Description
		1 2 3 4	Drain Source Drain Gate

ELECTRICAL CHARACTERISTICS ▲ T_A = 25°C, unless otherwise noted

Item	Condition	Symbol	Min.	Typ.	Max.	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = 250µA	BV_{DSS}	100			V
Zero Gate Voltage Drain Current	V_{DS} = 100V, V_{GS} = 0V	I_{DSS}			1	µA
Gate Body Leakage Current, Forward	V_{GS} = 16V, V_{DS} = 0V	I_{GSSF}			100	nA
Gate Body Leakage Current, Reverse	V_{GS} = -16V, V_{DS} = 0V	I_{GSSR}			-100	nA
On Characteristics Note 3						
Gate Threshold Voltage	V_{GS} = V_{DS}, I_D = 250µA	$V_{GS(th)}$	0.4		1.4	V
Static Drain-Source On-Resistance	V_{GS} = 10V, I_D = 2A	$R_{DS(ON)}$		98	120	mΩ
Static Drain-Source On-Resistance	V_{GS} = 5V, I_D = 1.5A	$R_{DS(ON)}$		103	130	mΩ
Static Drain-Source On-Resistance	V_{GS} = 3V, I_D = 1A	$R_{DS(ON)}$		120	165	mΩ
Dynamic Characteristics Note 4						
Input Capacitance	V_{DS} = 15V, V_{GS} = 0V, f = 1MHz	C_{ISS}		535		pF
Output Capacitance	V_{DS} = 15V, V_{GS} = 0V, f = 1MHz	C_{OSS}		160		pF
Reverse Transfer Capacitance	V_{DS} = 15V, V_{GS} = 0V, f = 1MHz	C_{RSS}		45		pF
Switching Characteristics Note 4						
Turn-On Delay Time	V_{DD} = 50V, V_{GS} = 10V, I_D = 3A, $R_{G(ext)}$ = 6Ω	$t_{D(ON)}$		8		ns
Turn-On Rise Time	V_{DD} = 50V, V_{GS} = 10V, I_D = 3A, $R_{G(ext)}$ = 6Ω	t_R		4		ns
Turn-Off Delay Time	V_{DD} = 50V, V_{GS} = 10V, I_D = 3A, $R_{G(ext)}$ = 6Ω	$t_{D(OFF)}$		35		ns
Turn-Off Fall Time	V_{DD} = 50V, V_{GS} = 10V, I_D = 3A, $R_{G(ext)}$ = 6Ω	t_F		4		ns
Total Gate Charge	V_{DS} = 80V, V_{GS} = 4.5V, I_D = 3A	Q_G		9.6		nC
Gate Source Charge	V_{DS} = 80V, V_{GS} = 4.5V, I_D = 3A	Q_{GS}		0.9		nC
Gate Drain Charge	V_{DS} = 80V, V_{GS} = 4.5V, I_D = 3A	Q_{GD}		3.9		nC
Drain-Source Diode Characteristics and Maximum Ratings						
Drain-Source Diode Forward Current Note 3		I_S			2.5	A
Drain-Source Diode Forward Voltage Note 3	V_{GS} = 0V, I_S = 2A	V_{SD}			1.2	V

Notes

1: **Repetitive Rating: Pulse width limited by maximum junction temperature**
2: **Surface Mounted on FR4 Board, t ≤ 10 sec**
3: **Pulse Test: Pulse Width ≤ 300µs, Duty Cycle ≤ 2%.**
4: **Guaranteed by design, not subject to production testing.**

REFERENCE DATA ▲ TYPICAL DEVICE PERFORMANCE

Fig. 1 ▪ Output Characteristics

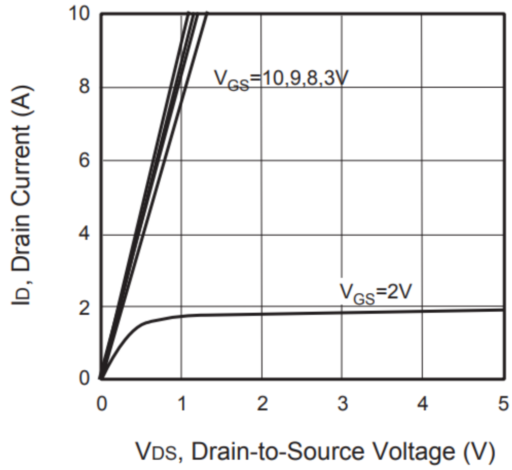


Fig. 2 ▪ Transfer Characteristics

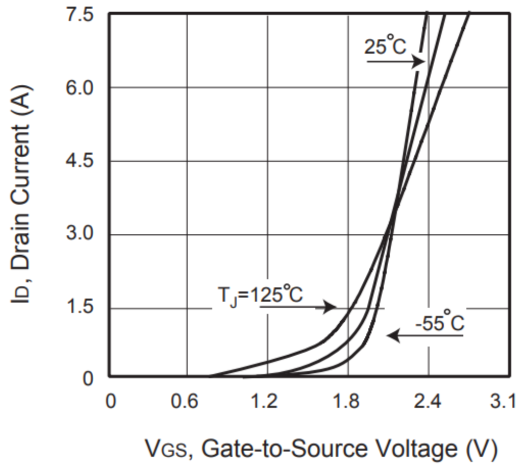


Fig. 3 ▪ Capacitance

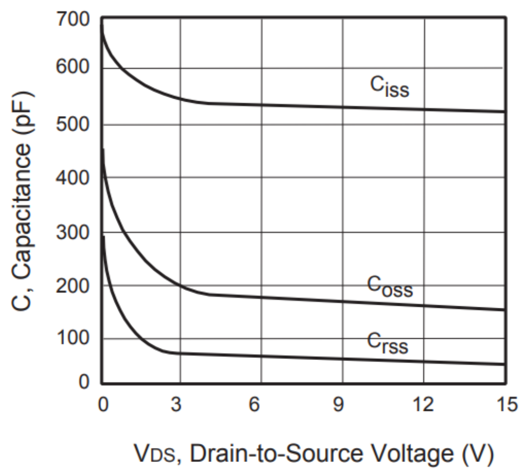


Fig. 4 ▪ On-Resistance Variation with Temperature

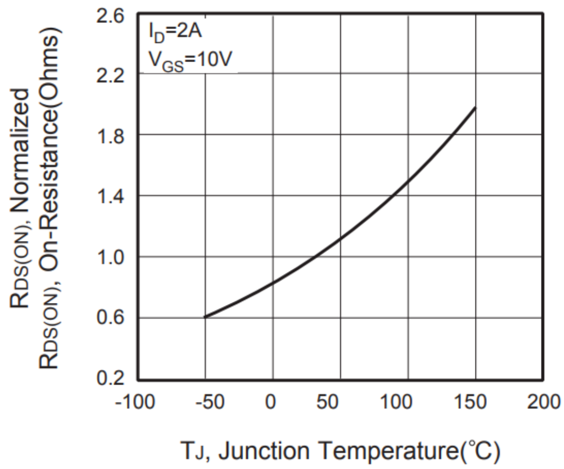


Fig. 5 ▪ Gate Threshold Variation with Temperature

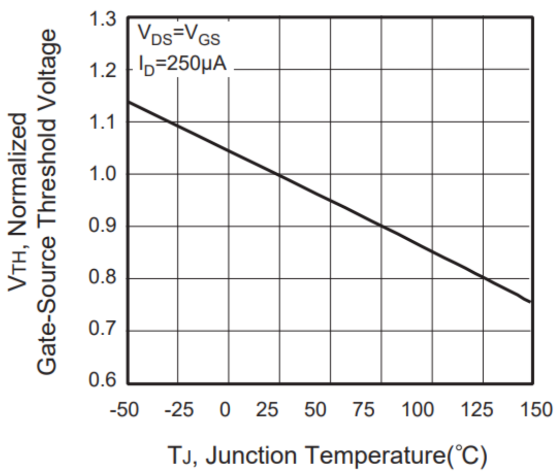
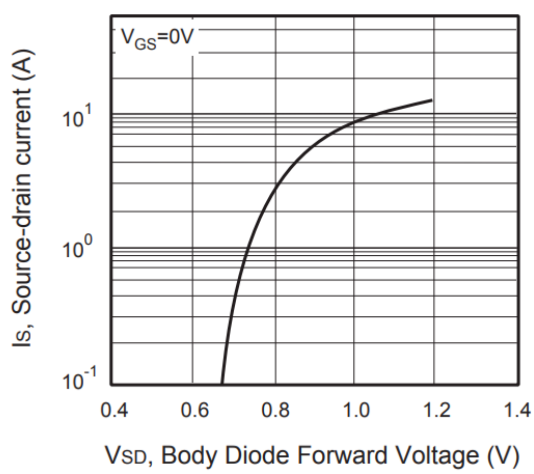


Fig. 6 ▪ Body Diode Forward Voltage Variation with Source Current



REFERENCE DATA ▲ TYPICAL DEVICE PERFORMANCE

Fig. 7 ▪ Gate Charge

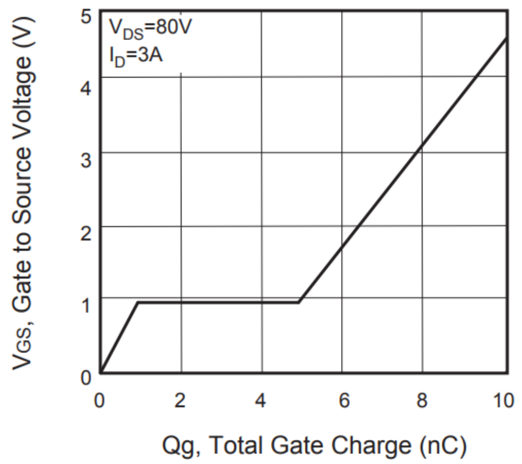


Fig. 8 ▪ Maximum Safe Operating Area

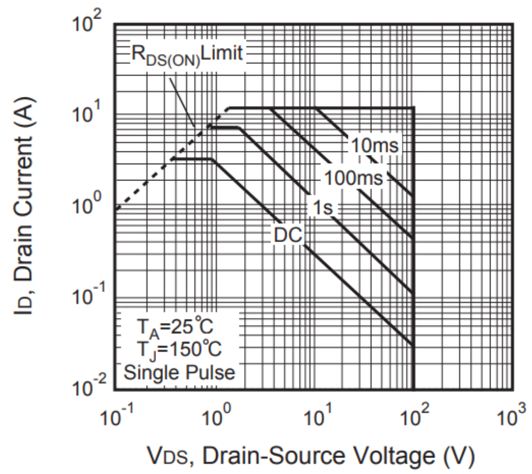


Fig. 9 ▪ Breakdown Voltage Variation vs. Temperature

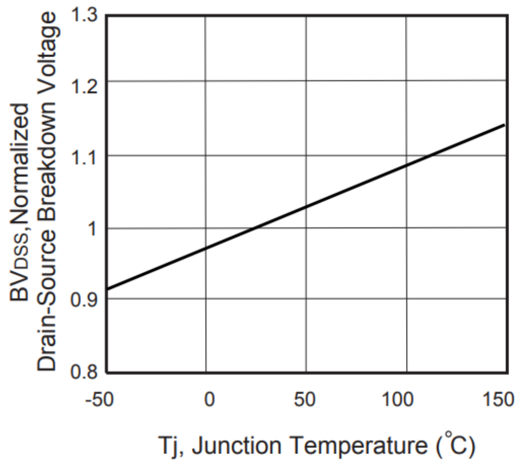


Fig. 10 ▪ Switching Test Circuit

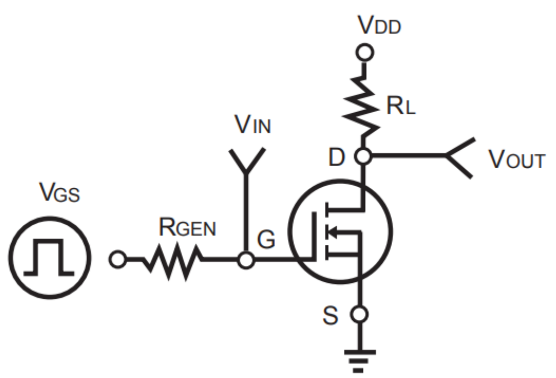
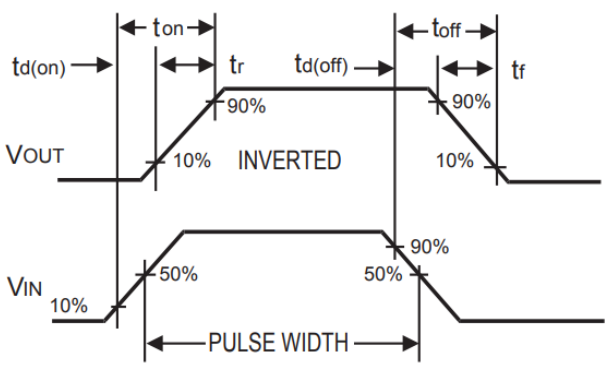
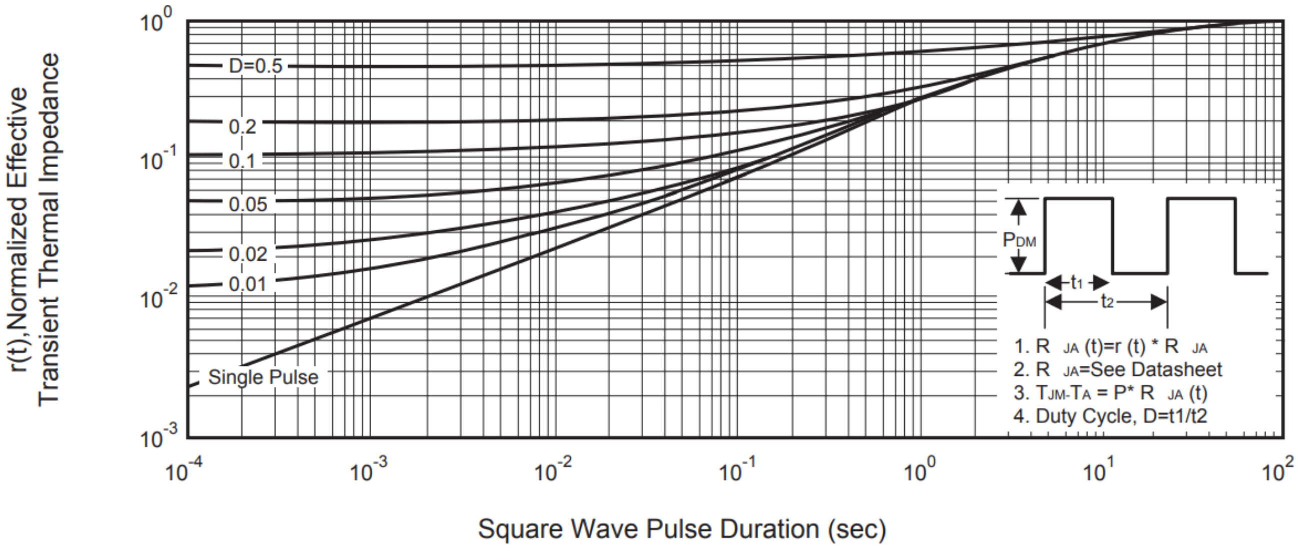


Fig. 11 ▪ Switching Waveforms

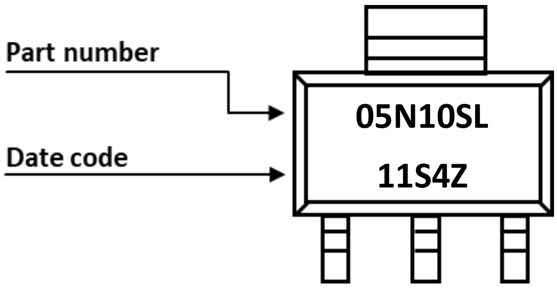


REFERENCE DATA ▲ TYPICAL DEVICE PERFORMANCE

Fig. 12 ▪ Normalized Thermal Transient Impedance Curve

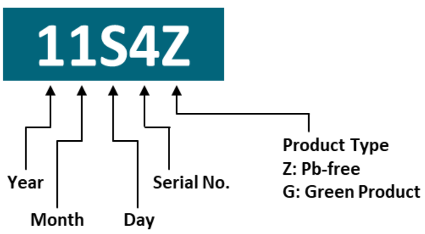


PART MARKING



DATE CODE

Example: 11S4Z



Coding list for „Day“

1	2	3	4	5	6	7	8	9	A
01	02	03	04	05	06	07	08	09	10
B	C	D	E	F	G	H	I	J	K
11	12	13	14	15	16	17	18	19	20
L	M	N	O	P	Q	R	S	T	U
21	22	23	24	25	26	27	28	29	30
V									
31									

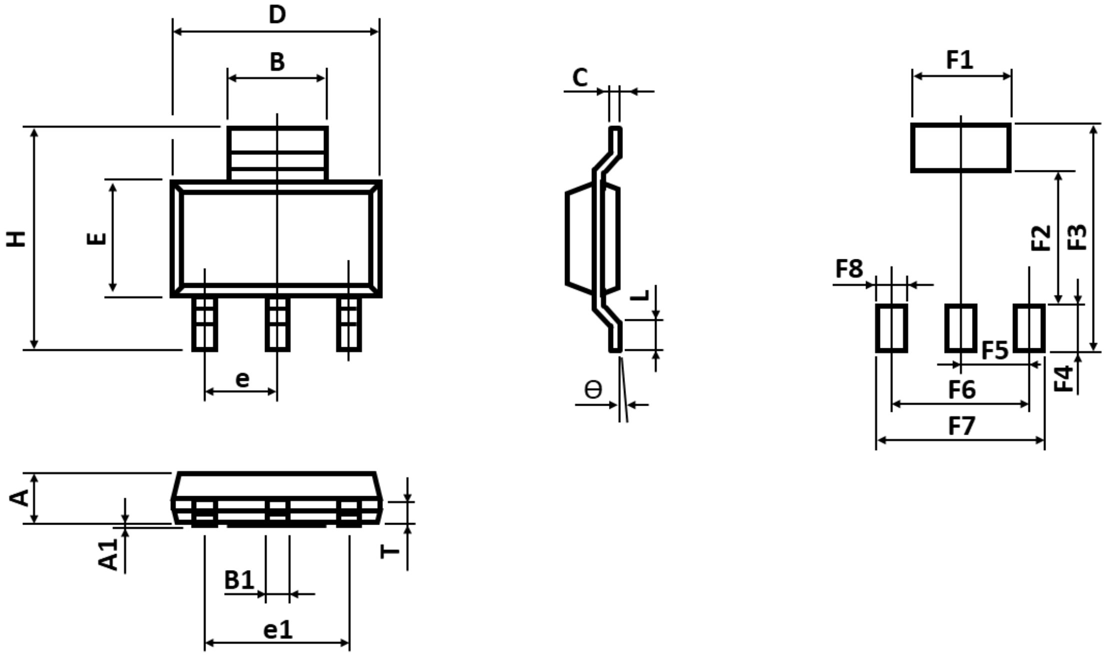
Coding list for „Month“

1	2	3	4	5	6
Jan	Feb	Mar	Apr	May	Jun
7	8	9	A	B	C
Jul	Aug	Sep	Oct	Nov	Dec

Coding list for „Year“

0	1	2	3	4
2020	2021	2022	2023	2024
5	6	7	8	9
2025	2026	2027	2028	2029

PACKAGE OUTLINE AND RECOMMENDED PAD LAYOUT



Sym	Millimeters (Min.)	Millimeters (Typ.)	Millimeters (Max.)
A	1.500	-	1.700
A1	0.020	-	0.100
B	2.950	-	3.200
B1	0.670	-	0.800
C	0.240	-	0.350
D	6.300	-	6.850
e		2.300 TYP	

Sym	Millimeters (Min.)	Millimeters (Typ.)	Millimeters (Max.)
e1		4.600 TYP	
E	3.300	-	3.800
H	6.700	-	7.300
L	0.900	-	-
T	0.600	-	0.800
Θ		10° MAX	

Sym	Millimeters (Min.)	Millimeters (Typ.)	Millimeters (Max.)
F1	-	3.500	-
F2	-	4.600	-
F3	-	8.000	
F4	-	1.600	

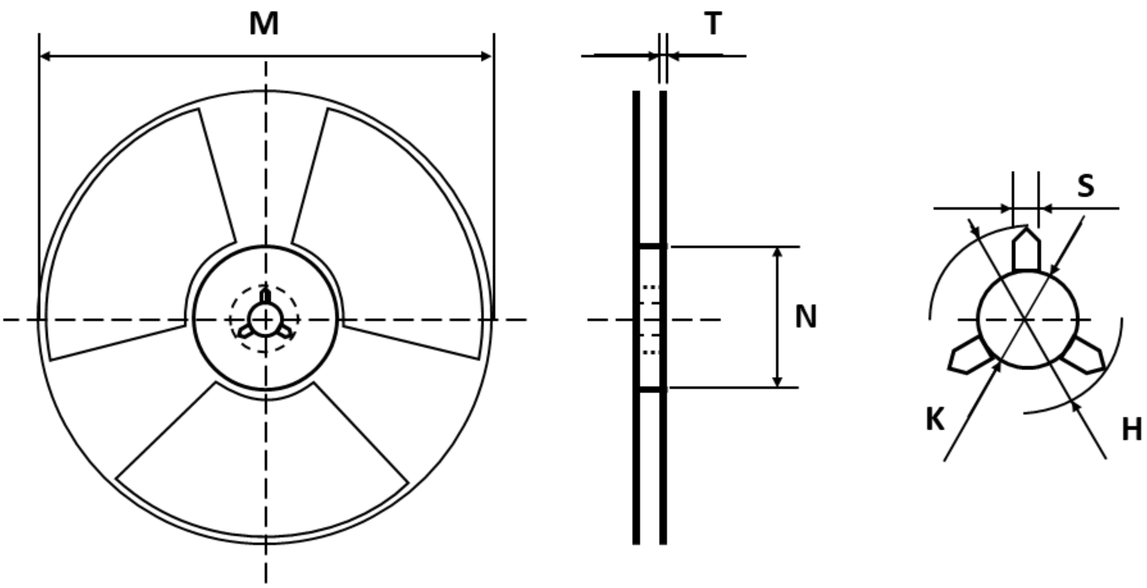
Sym	Millimeters (Min.)	Millimeters (Typ.)	Millimeters (Max.)
F5	-	2.300	-
F6	-	4.600	-
F7	-	5.600	-
F8	-	1.200	-

Notes: 1. The suggested land pattern dimensions have been provided for reference only.
2. For further information, please reference document IPC-7351A.

ORDERING INFORMATION

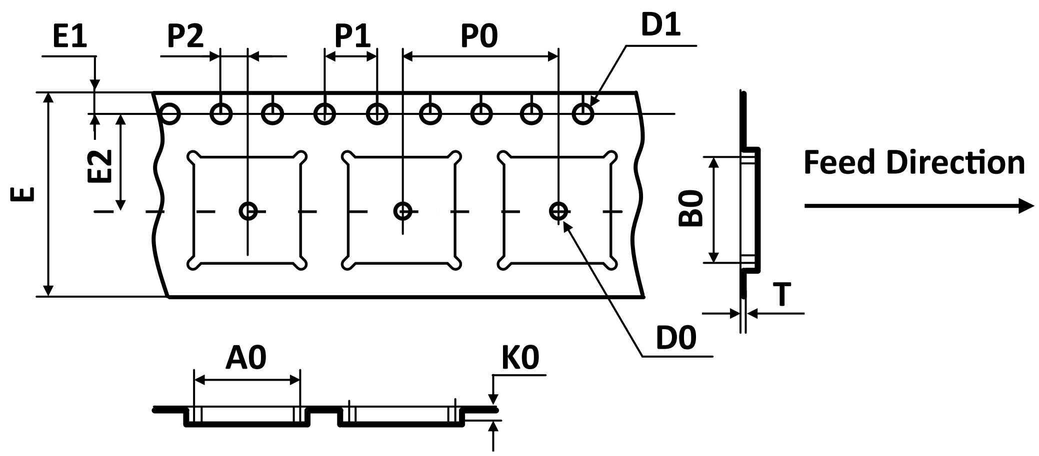
Part Number	Package	Packing	Reel Qty.	Inner Box Qty.	Outer Box Qty.
CET05N10SL	SOT223	7” Reel	2,500pcs	5,000pcs	15,000pcs

REEL DIMENSIONS ▲ All dimensions in mm



Tape Size	Reel Size	M	N	T	H	K	S
8mm	Ø180	Ø178.00	Ø54.00	1.20	20.00	13.30	3.00
		±1.00	±0.50	±0.20	±1.00	±0.30	±1.00

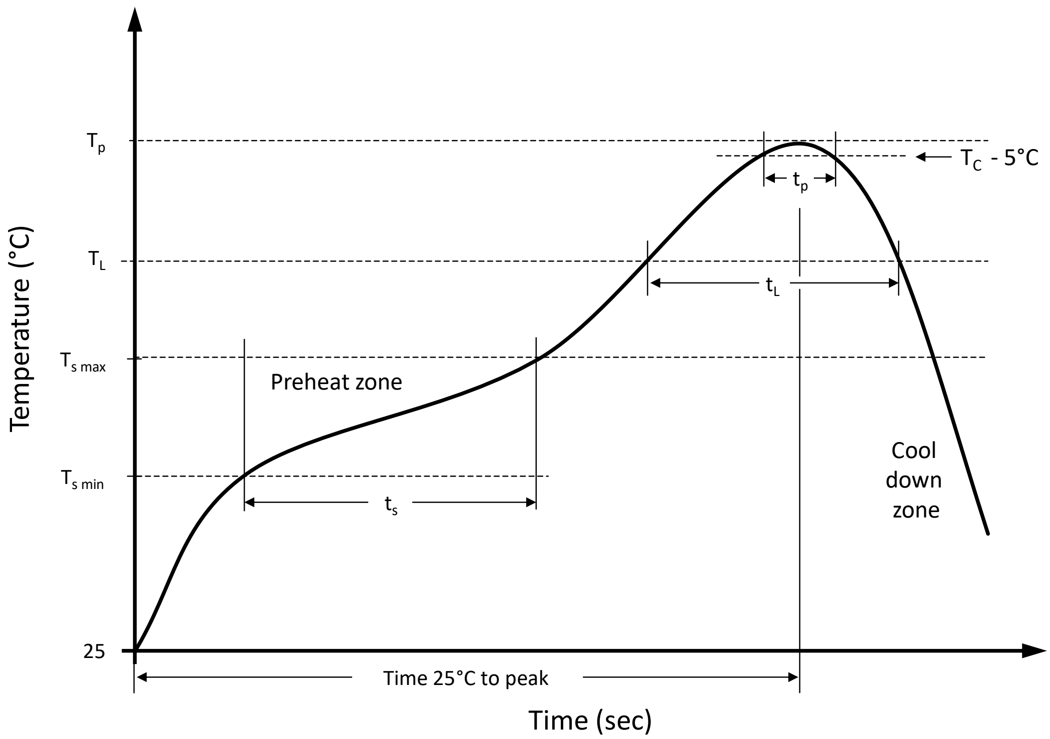
TAPE DIMENSIONS ▲ All dimensions in mm



Package	A0	B0	K0	D0	D1	E	E1	E2	P0	P1	P2	T
SOT223	2.40	2.60	1.20	1.00	1.50	8.00	1.75	3.50	4.00	4.00	2.00	0.20
	±0.10	±0.10	±0.10	±0.10	±0.10	±0.10	±0.10	±0.10	±0.10	±0.10	±0.05	±0.02

Note: **All dimensions meet EIA-481-D requirements.**

RECOMMENDED REFLOW SOLDERING PROFILE



Recommended reflow soldering conditions ▲ Refer to JEDEC J-STD-020E

Profile Features		Sn-Pb Eutetic Assembly	Pb-Free Assembly
Preheat temperature min.	$T_{s\ min}$	100 °C	150 °C
Preheat temperature max.	$T_{s\ max}$	150 °C	200 °C
Preheat time t_s from $T_{s\ min}$ to $T_{s\ max}$	t_s	120 seconds	120 seconds
Ramp-up rate (T_L to T_p)		max. 3 °C/second	max. 3 °C/second
Liquidous temperature	T_L	183 °C	217 °C
Time t_L maintained above T_L	t_L	150 seconds max.	150 seconds max.
Peak package body temperature	T_p	235°C	260°C
Timeframe of within 5°C below and up to max actual peak body temperature	t_p	20 seconds max.	30 seconds max.
Ramp-down rate (T_L to T_p)		max. 6 °C/second	max. 6 °C/second
Time 25°C to peak temperature		max. 6 minutes	max. 8 minutes

REVISION TABLE

Revision	Date	Status	Notes
001	30/09/2022	Initial release	Initial publication

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