

CEP83A3

30V ▲ 4.2mΩ ▲ 100A ▲ Si MOSFET

SILICON Si MOSFET ▲ THT type
N-channel enhancement mode
UL94V-0 rated flame retardant epoxy
TO220-3L package
Super high dense cell density for extremely low $R_{DS(ON)}$
High power and current handling capability

MAXIMUM RATINGS

Parameter (T_C = 25°C, unless otherwise noted)		Characteristics
Drain-Source Voltage	V_{DS}	30V
Gate-Source Voltage	V_{GS}	±20V
Continuous Drain Current at T_C = 25°C	I_D	100A
Pulsed Drain Current Note 1	I_{DM}	400A
Maximum Power Dissipation at T_C = 25°C	P_D	100W
Power Dissipation Derating above 25°C	ΔP_D	0.67W/°C
Operating and Storage Temperature Range	T_J, T_{STG}	-55°C to +175°C

THERMAL CHARACTERISTICS

Parameter	Symbol	Limit
Thermal Resistance, Junction-to-Case	R_{TH_JC}	1.5°C/W
Thermal Resistance, Junction-to-Ambient Note 2	R_{TH_JA}	62.5°C/W

APPLICATIONS

Battery Management Systems	DC/DC Converter	High Side Switches	Industrial Control	Low Side Switches

PIN DESCRIPTION

Circuit Diagram	Outline ▪ Front View	Pin No.	Description
D (2) G (1) S (3)	2 1 2 3	1 2 3	Gate Drain Source

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ELECTRICAL CHARACTERISTICS ▲ T_C = 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}	30			V
Zero Gate Voltage Drain Current	V_{DS} = 30V, V_{GS} = 0V	I_{DSS}			1	µA
Gate Body Leakage Current, Forward	V_{GS} = 20V, V_{DS} = 0V	I_{GSSF}			10	nA
Gate Body Leakage Current, Reverse	V_{GS} = -20V, V_{DS} = 0V	I_{GSSR}			-10	nA
On Characteristics Note 3						
Gate Threshold Voltage	V_{GS} = V_{DS}, I_D = 250µA	$V_{GS(th)}$	1		3	V
Static Drain-Source On-Resistance	V_{GS} = 10V, I_D = 50A	$R_{DS(ON)}$		4.2	5.3	mΩ
Static Drain-Source On-Resistance	V_{GS} = 4.5V, I_D = 40A	$R_{DS(ON)}$		6	8	mΩ
Dynamic Characteristics Note 3						
Input Capacitance	V_{DS} = 15V, V_{GS} = 0V, f = 1MHz	C_{ISS}		6350		pF
Output Capacitance	V_{DS} = 15V, V_{GS} = 0V, f = 1MHz	C_{OSS}		980		pF
Reverse Transfer Capacitance	V_{DS} = 15V, V_{GS} = 0V, f = 1MHz	C_{RSS}		600		pF
Forward Transconductance	V_{DS} = 10V, I_D = 15A	g_{FS}		27		S
Switching Characteristics Note 3						
Turn-On Delay Time	V_{DD} = 15V, V_{GS} = 10V, I_D = 1A, $R_{G(ext)}$ = 6Ω	$t_{D(ON)}$		22		ns
Turn-On Rise Time	V_{DD} = 15V, V_{GS} = 10V, I_D = 1A, $R_{G(ext)}$ = 6Ω	t_R		24		ns
Turn-Off Delay Time	V_{DD} = 15V, V_{GS} = 10V, I_D = 1A, $R_{G(ext)}$ = 6Ω	$t_{D(OFF)}$		209		ns
Turn-Off Fall Time	V_{DD} = 15V, V_{GS} = 10V, I_D = 1A, $R_{G(ext)}$ = 6Ω	t_F		173		ns
Total Gate Charge	V_{DS} = 15V, V_{GS} = 5V, I_D = 16A	Q_G		53		nC
Gate Source Charge	V_{DS} = 15V, V_{GS} = 5V, I_D = 16A	Q_{GS}		15		nC
Gate Drain Charge	V_{DS} = 15V, V_{GS} = 5V, I_D = 16A	Q_{GD}		22		nC
Drain-Source Diode Characteristics and Maximum Ratings						
Drain-Source Diode Forward Current		I_S			100	A
Drain-Source Diode Forward Voltage Note 2	V_{GS} = 0V, I_S = 20A	V_{SD}			1.5	V

Notes

1: Repetitive Rating: Pulse width limited by maximum junction temperature

2: Pulse Test: Pulse Width ≤ 300µs, Duty Cycle ≤ 2%.

3: Guaranteed by design, not subject to production testing.

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REFERENCE DATA ▲ TYPICAL DEVICE PERFORMANCE

Fig. 1 ▪ Output Characteristics

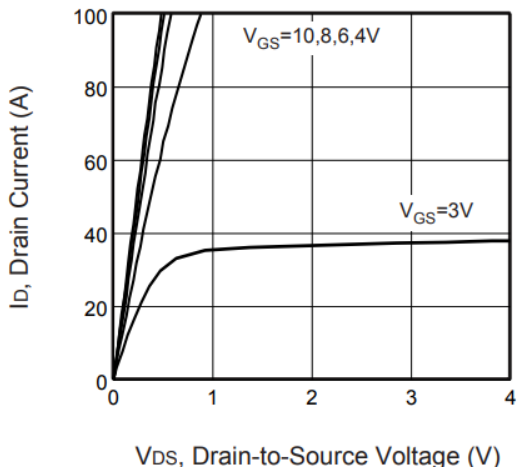


Fig. 2 ▪ Transfer Characteristics

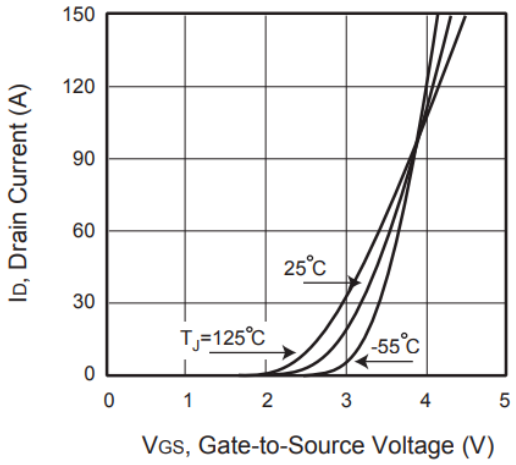


Fig. 3 ▪ Capacitance

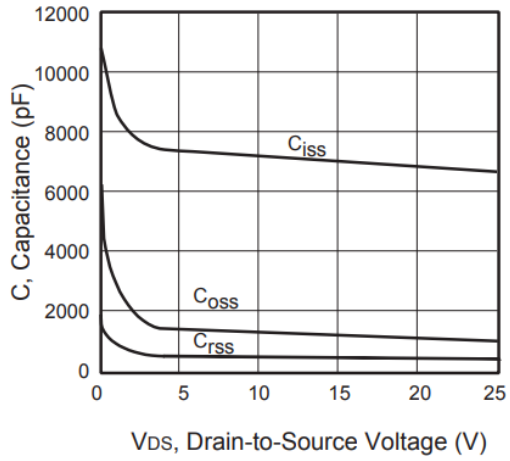


Fig. 4 ▪ On-Resistance Variation with Temperature

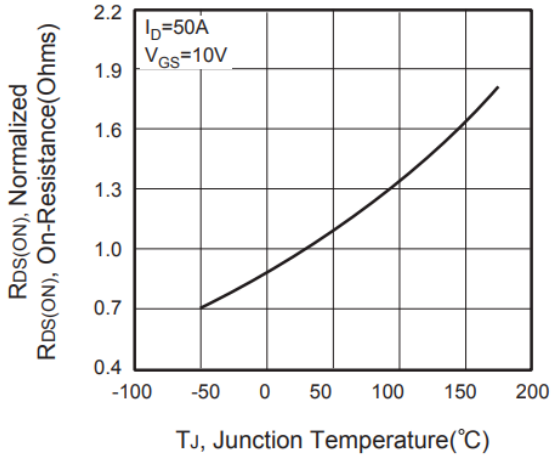


Fig. 5 ▪ Gate Threshold Variation with Temperature

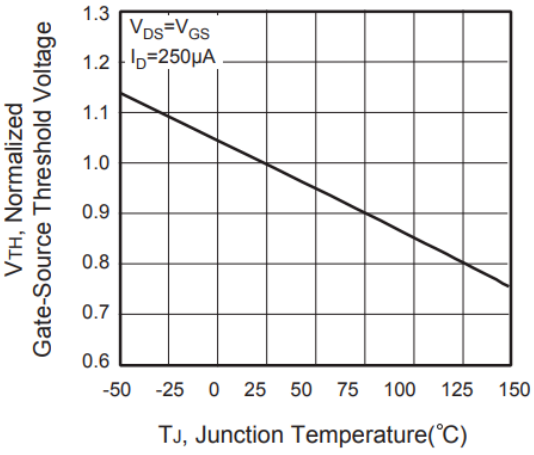
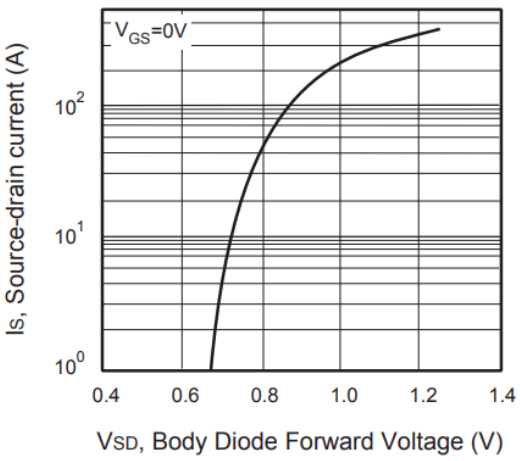


Fig. 6 ▪ Body Diode Forward Voltage Variation with Source Current



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REFERENCE DATA ▲ TYPICAL DEVICE PERFORMANCE

Fig. 7 ▪ Gate Charge

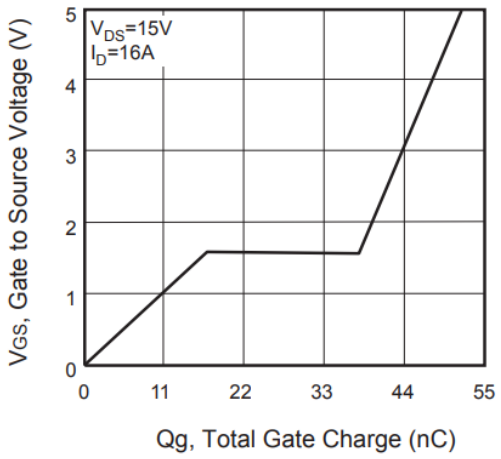


Fig. 8 ▪ Maximum Safe Operating Area

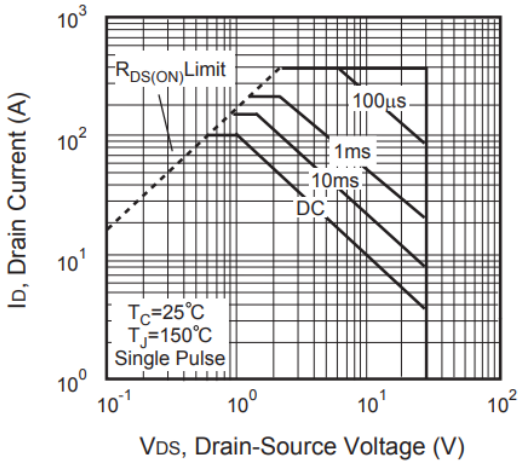


Fig. 9 ▪ Switching Test Circuit

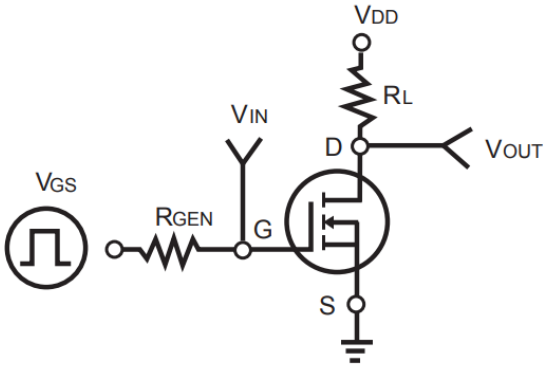


Fig. 10 ▪ Switching Waveforms

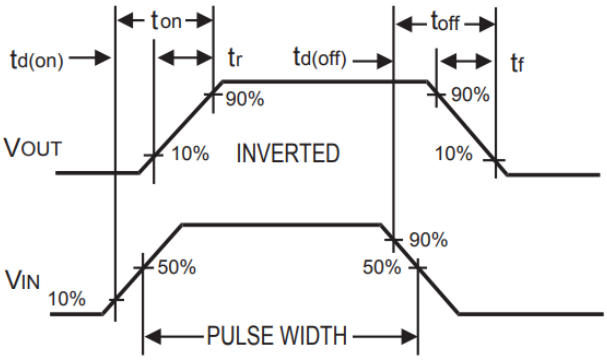
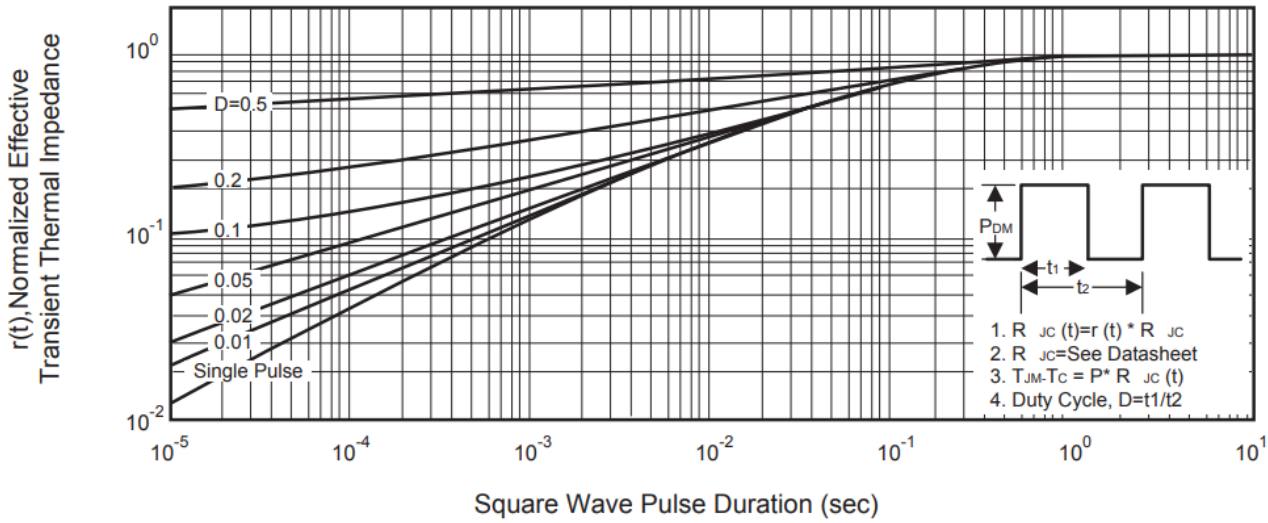
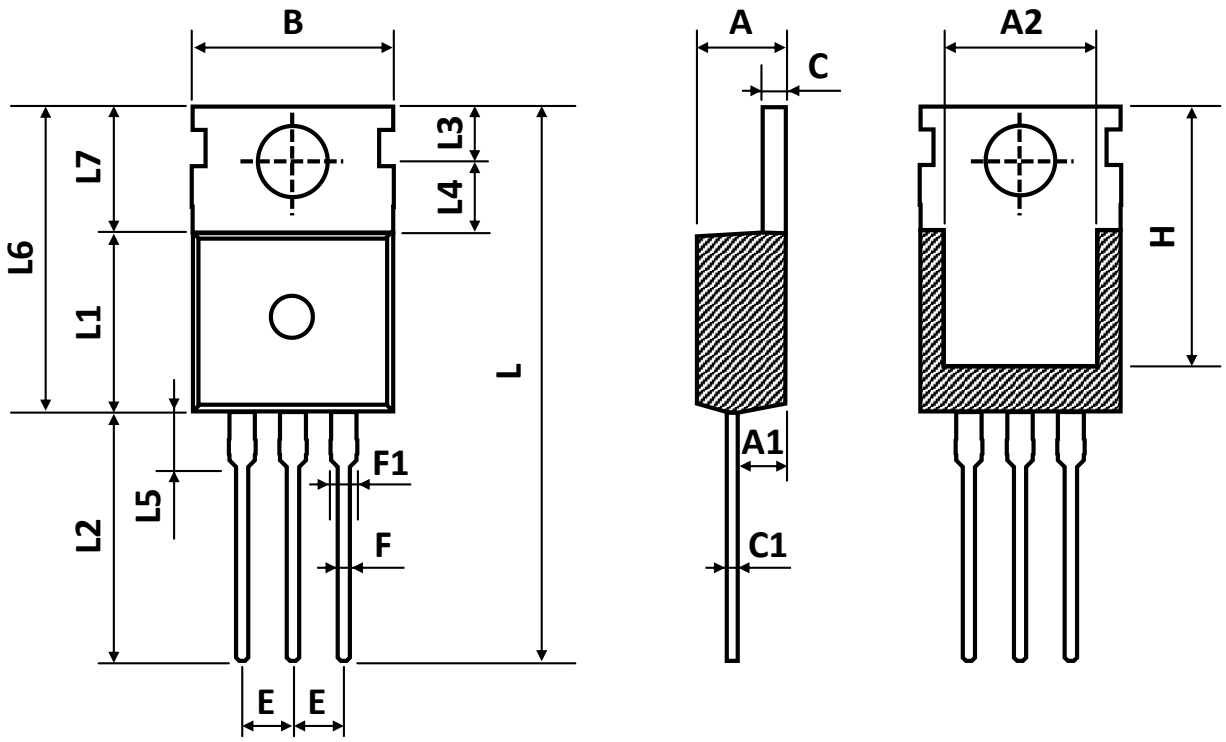


Fig. 11 ▪ Normalized Thermal Transient Impedance Curve



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PACKAGE OUTLINE



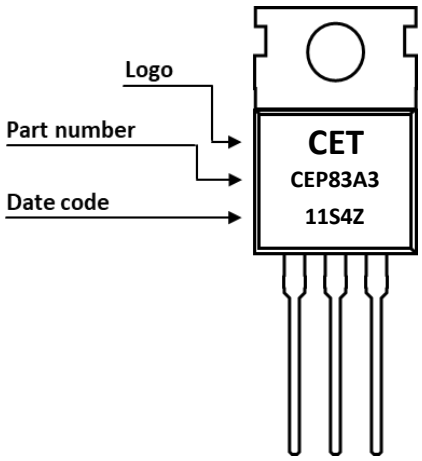
Sym	Millimeters (Min.)	Millimeters (Typ.)	Millimeters (Max.)
A	4.43	4.53	4.63
A1	2.30	2.40	2.50
A2	7.70	7.90	8.10
B	9.80	10.00	10.20
C	1.25	1.30	1.40
C1	0.45	0.50	0.60
D	3.45	3.60	3.70
E	2.45	2.54	2.60
F	0.70	0.80	0.95
F1	1.15	1.33	1.50
L	26.80	28.80	30.80
L1	9.20	9.30	9.40
L2	12.80	13.10	13.40
L3	2.70	2.80	2.90
L4	3.50	3.70	3.80
L5	2.60	2.90	3.20
L6	15.40	15.80	16.20
L7	6.20	6.50	6.80
H	12.95	13.25	13.55

ORDERING INFORMATION

Part Number	Package	Packing	Tube Qty.	Inner Box Qty.	Outer Box Qty.
CEP83A3	TO-220-3L	Tube	50pcs	1,000pcs	4,000pcs

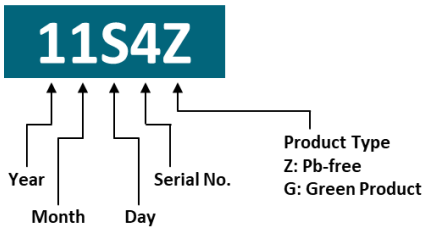
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PART MARKING



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“

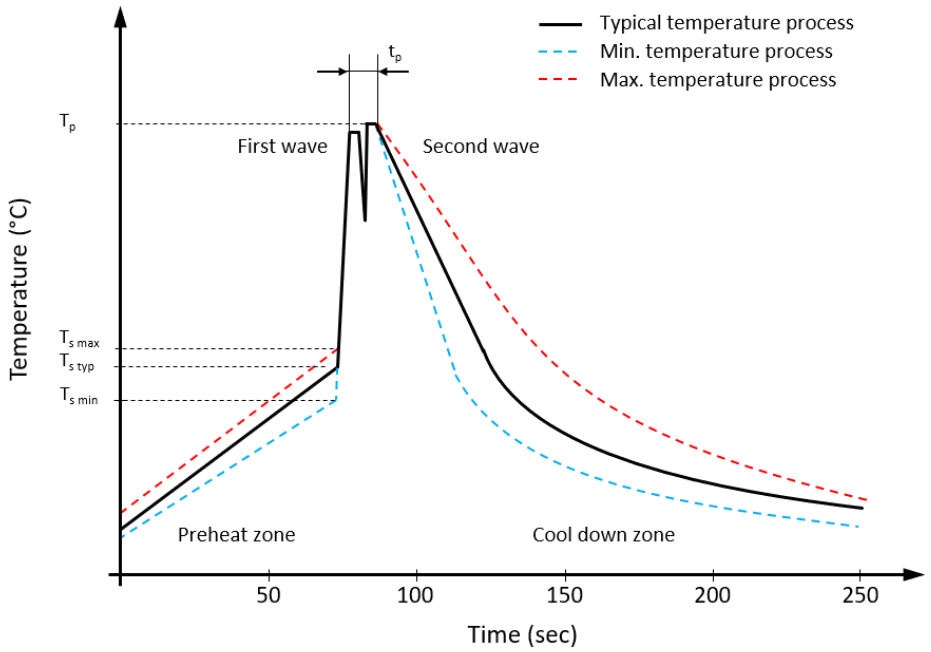
1	2	3	4	5	6
Jan	Feb	Mar	Apr	May	Jun
7	8	9	A	B	C
Jul	Aug	Sep	Oct	Nov	Dec

Coding list for „Year“

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

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RECOMMENDED WAVE SOLDERING PROFILE ▲ THT PACKAGE



Classification wave soldering profile ▲ Refer to EN 61760-1: 2006

Profile Features		Value ▲ Sn-Pb Assembly	Value ▲ Pb-free Assembly
Preheat temperature min.	$T_{s\ min}$	100 °C	100 °C
Preheat temperature typical	$T_{s\ typ}$	120 °C	120 °C
Preheat temperature max.	$T_{s\ max}$	130 °C	130 °C
Preheat time t_s from $T_{s\ min}$ to $T_{s\ max}$	t_s	70 seconds	70 seconds
Peak temperature	T_p	235 °C to 260 °C	245 °C to 260 °C
Time of actual peak temperature	t_p	Max. 10 seconds Max. 5 second each wave	Max. 10 seconds Max. 5 second each wave
Ramp-down date min.		~ 2 °C/second	~ 2 °C/second
Ramp-down rate typical		~ 3.5 °C/second	~ 3.5 °C/second
Ramp-down rate max.		~ 5 °C/second	~ 5 °C/second
Time 25°C to 25°C		4 minutes	4 minutes

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REVISION TABLE

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

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