

Description:

This N+P Channel MOSFET uses advanced trench technology and design to provide excellent $R_{DS(on)}$ with low gate charge.

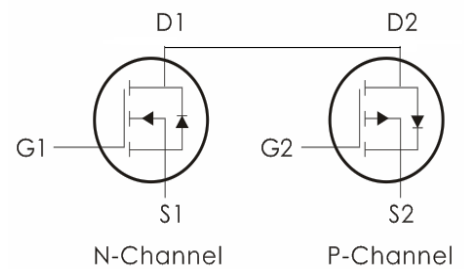
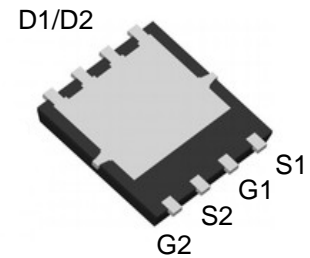
It can be used in a wide variety of applications.

Features:

N-Channel: $V_{DS}=30V, I_D=30A, R_{DS(on)} < 10m\Omega @ V_{GS}=10V$ (Typ: $7.5m\Omega$)

P-Channel: $V_{DS}=-30V, I_D=-25A, R_{DS(on)} < 25m\Omega @ V_{GS}=-10V$ (Typ: $19m\Omega$)

- 1) Low gate charge.
- 2) Green device available.
- 3) Advanced high cell density trench technology for ultra low $R_{DS(on)}$.
- 4) Excellent package for good heat dissipation.
- 5) MSL3



Package Marking and Ordering Information:

Part NO.	Marking	Package	Packing
DOM617-S	M617-S	DFN5*6-8C	5000 pcs/Reel

Absolute Maximum Ratings: ($T_C=25^\circ C$ unless otherwise noted)

Symbol	Parameter	N-Channel	P-Channel	Units
V_{DS}	Drain-Source Voltage	30	-30	V
V_{GS}	Gate-Source Voltage	± 20	± 20	V
I_D	Continuous Drain Current- $T_C=25^\circ C^1$	30	-25	A
	Continuous Drain Current- $T_C=100^\circ C^1$	21	-17.5	
I_{DM}	Pulsed Drain Current ²	120	-100	A
E_{AS}	Single pulse avalanche energy ³	49	49	mJ
P_D	Power Dissipation - $T_C=25^\circ C$	28	28	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150		$^\circ C$

Thermal Characteristics:

Symbol	Parameter	N-CH	P-CH	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Cast	5.4	5.4	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	62	62	$^\circ C/W$

N-Channel Electrical Characteristics: ($T_C=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\ \mu\text{A}$	30	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{GS}=0V, V_{DS}=30V$	---	---	1	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0A$	---	---	± 100	nA
On Characteristics						
$V_{GS(th)}$	Gate-Source Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\ \mu\text{A}$	1.0	1.5	2.5	V
$R_{DS(on)}$	Drain-Source On Resistance ⁴	$V_{GS}=10V, I_D=20A$	---	7.5	10	$\text{m}\Omega$
		$V_{GS}=4.5V, I_D=10A$	---	11	17	$\text{m}\Omega$
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS}=15V, V_{GS}=0V, f=1\text{MHz}$	---	950	---	pF
C_{oss}	Output Capacitance		---	118	--	
C_{rss}	Reverse Transfer Capacitance		---	100	---	
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	$V_{DS}=15V, I_D=15A,$ $R_{ENG}=3.3\ \Omega, V_{GS}=10V$	---	3	---	ns
t_r	Rise Time		---	6	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	28	---	ns
t_f	Fall Time		---	3	---	ns
Q_g	Total Gate Charge		$V_{GS}=4.5V, V_{DS}=15V,$	---	9.8	---
Q_{gs}	Gate-Source Charge	$I_D=15A$	---	4	---	nC
Q_{gd}	Gate-Drain "Miller" Charge		---	3.3	---	nC
Drain-Source Diode Characteristics						
V_{SD}	Diode Forward Voltage	$V_{GS}=0V, I_{SD}=1A$	---	---	1.0	V
I_S	Continuous Drain Current	$V_D=V_G=0V$	---	---	30	A
I_{SM}	Pulsed Drain Current		---	---	120	A
T_{rr}	Reverse Recovery Time	$I_F=30A,$	---	8.5	---	ns
Q_{rr}	Reverse Recovery Charge	$dI/dt=100A/\mu\text{s}$	---	2.2	---	nC

Notes:

1. Computed continuous current assumes the condition of $T_{j,Max}$ while the actual continuous current depends on the thermal & electro-mechanical application board design
2. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
3. EAS condition : $T_J=25^{\circ}C, V_{DD}=15V, V_G=10V, L=0.5mH$
4. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 0.5\%$

N-Typical Characteristics: ($T_C=25^{\circ}C$ unless otherwise noted)

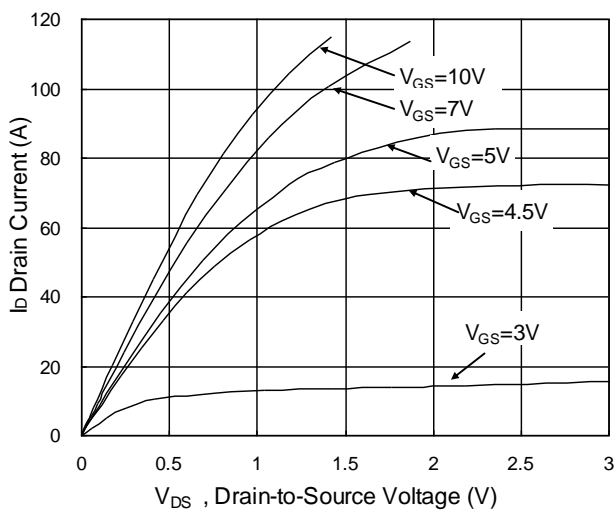


Fig.1 Typical Output Characteristics

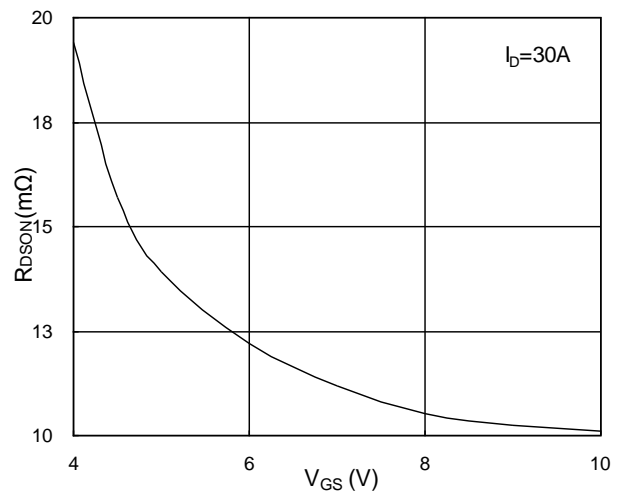


Fig.2 On-Resistance vs. G-S Voltage

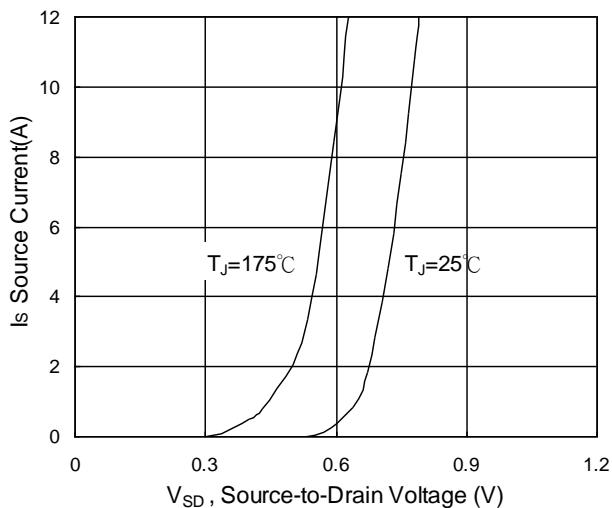


Fig.3 Forward Characteristics of Reverse

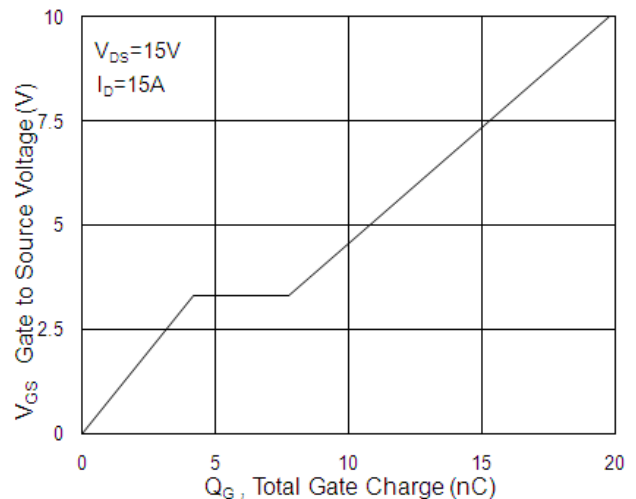


Fig.4 Gate-Charge Characteristics

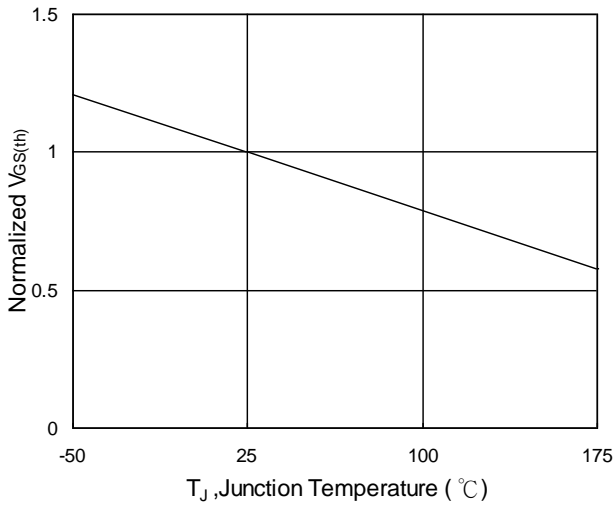


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

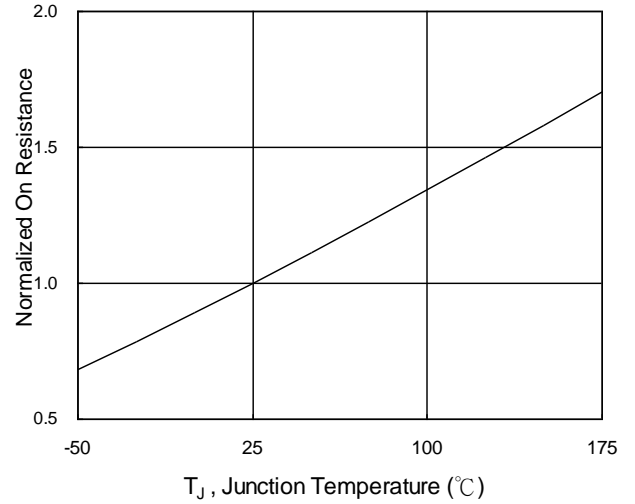


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

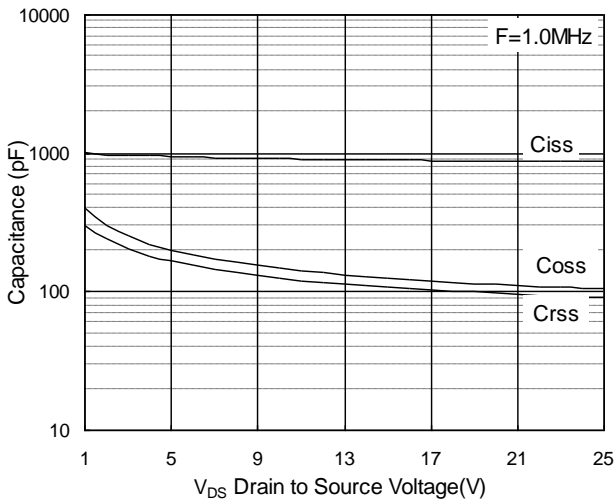


Fig.7 Capacitance

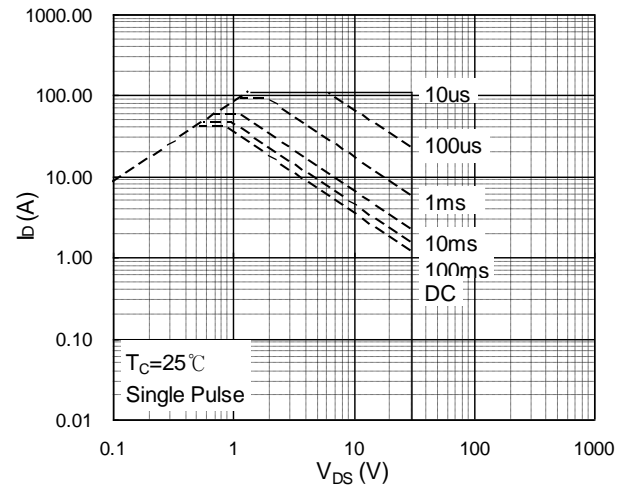


Fig.8 Safe Operating Area

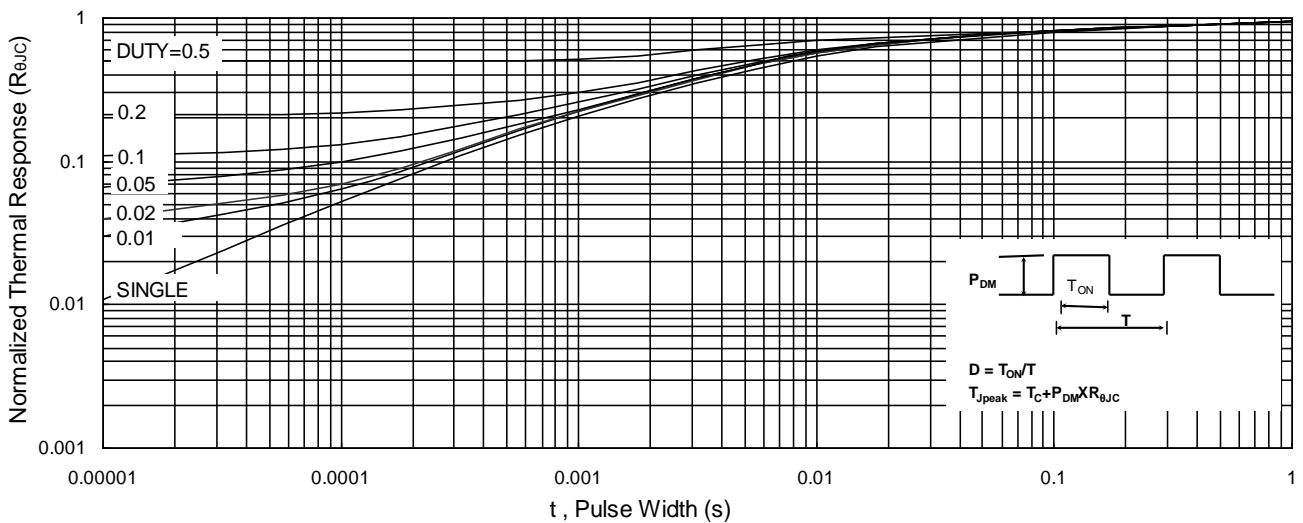


Fig.9 Normalized Maximum Transient Thermal Impedance

P-Channel Electrical Characteristics: ($T_A=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\ \mu\text{A}$	-30	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{GS}=0V, V_{DS}=-30V$	---	---	-1	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0A$	---	---	± 100	nA
On Characteristics						
$V_{GS(th)}$	GATE-Source Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\ \mu\text{A}$	-1	-1.5	-2	V
$R_{DS(on)}$	Drain-Source On Resistance ³	$V_{GS}=-10V, I_D=-10A$	---	19	25	$\text{m}\Omega$
		$V_{GS}=-4.5V, I_D=-5A$	---	27	40	
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS}=-15V, V_{GS}=0V, f=1\text{MHz}$	---	950	---	pF
C_{oss}	Output Capacitance		---	140	---	
C_{rss}	Reverse Transfer Capacitance		---	130	---	
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	$V_{DD}=-15V, I_D=-1A$ $V_{GS}=-10V, R_{GEN}=6\ \Omega$	---	12	---	ns
t_r	Rise Time		---	14	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	195	---	ns
t_f	Fall Time		---	95	---	ns
Q_g	Total Gate Charge		$V_{GS}=-10V, V_{DS}=-15V,$ $I_D=-8A$	---	20	---
Q_{gs}	Gate-Source Charge	---		9.5	---	nC
Q_{gd}	Gate-Drain "Miller" Charge	---		8.1	---	nC
Drain-Source Diode Characteristics						
I_S	Continuous Drain to Source Diode	$V_D=V_G=0V$	---	---	-25	A
I_{SM}	Pulsed Drain to Source Diode		---	---	-100	---
T_{rr}	Reverse Recovery Time	$I_F=-2A, T_J=25^\circ\text{C}$	---	23	---	ns
Q_{rr}	Reverse Recovery Charge	$di/dt=100A/\mu\text{s}$	---	14	---	nC
V_{SD}	Source-Drain Diode Forward Voltage	$V_{GS}=0V, I_S=-12A$	---	---	-1.2	V

Notes:

1. Computed continuous current assumes the condition of $T_{j,Max}$ while the actual continuous current depends on the thermal & electro-mechanical application board design
2. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
3. EAS condition : $T_J=25^{\circ}C, V_{DD}=-15V, V_G=-10V, L=0.5mH$
4. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 0.5\%$

P-Typical Characteristics: ($T_C=25^{\circ}C$ unless otherwise noted)

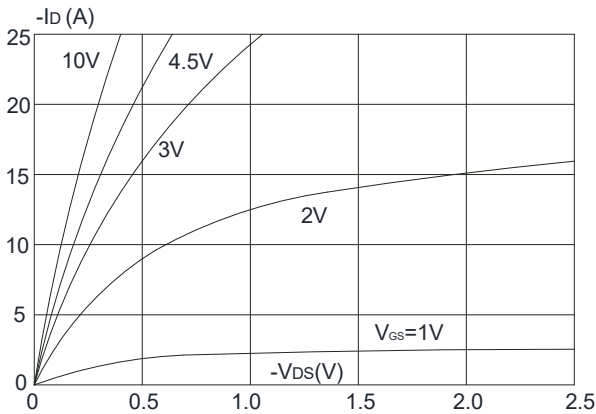


Figure 1: Output Characteristics

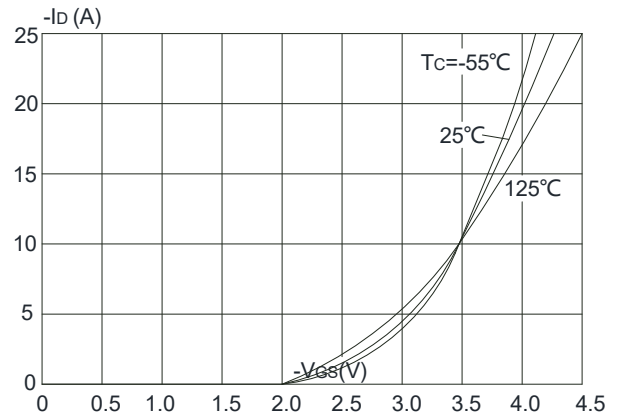


Figure 2: Typical Transfer Characteristics

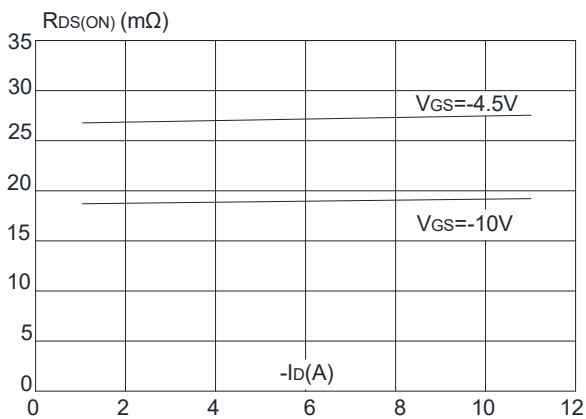


Figure 3: On-resistance vs. Drain Current

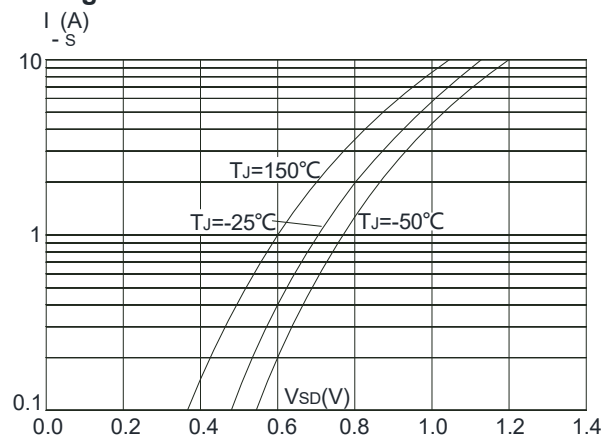


Figure 4: Body Diode Characteristics

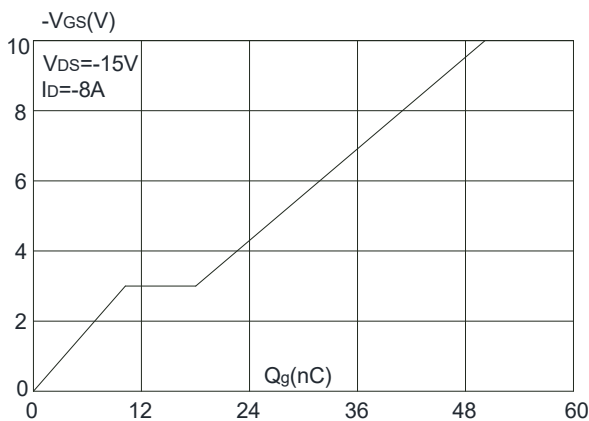


Figure 5: Gate Charge Characteristics

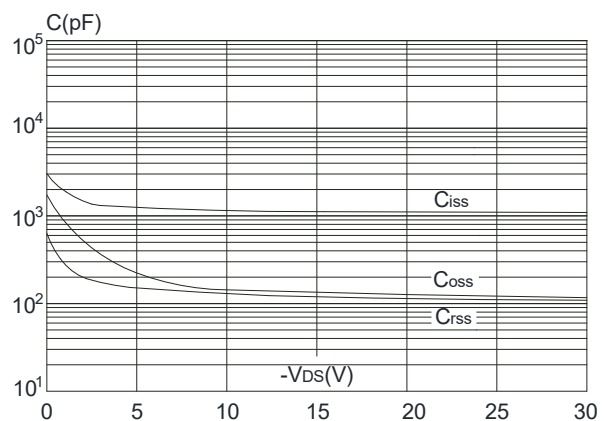


Figure 6: Capacitance Characteristics

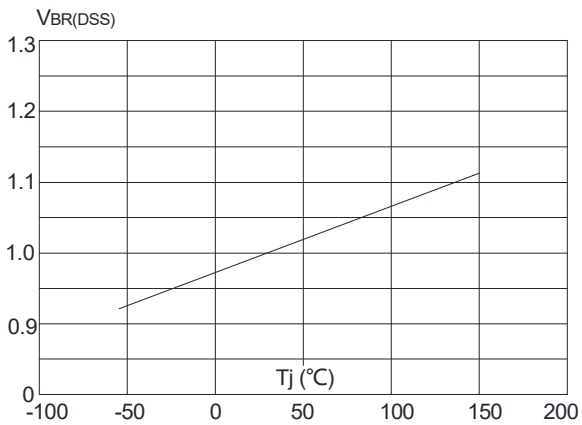


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

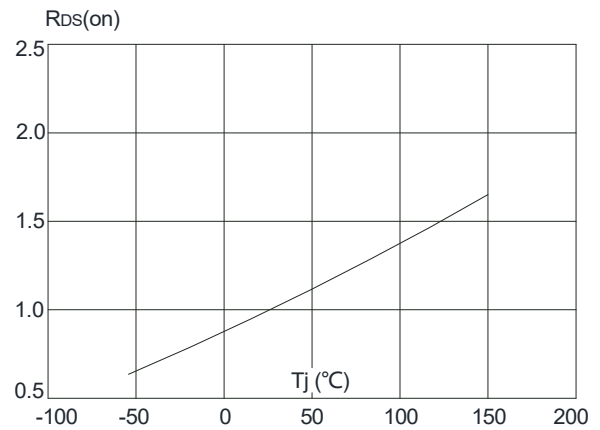


Figure 8: Normalized on Resistance vs. Junction Temperature

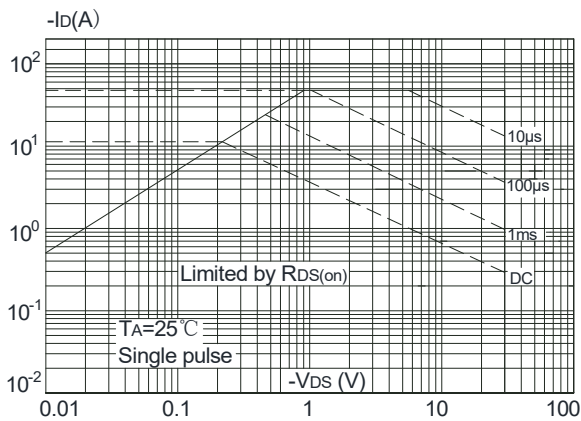


Figure 9: Maximum Safe Operating Area

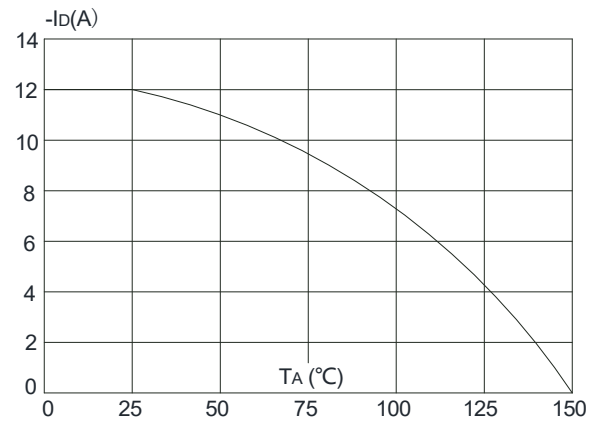


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

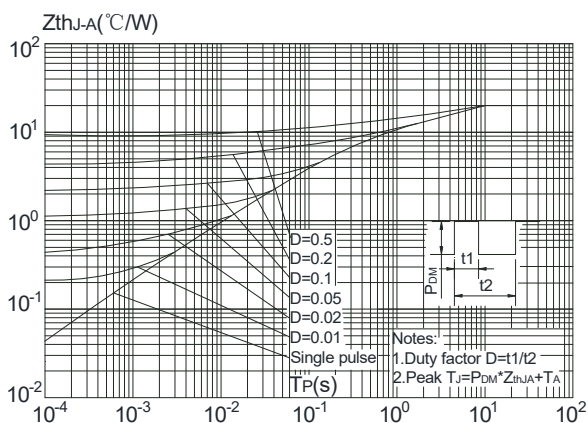
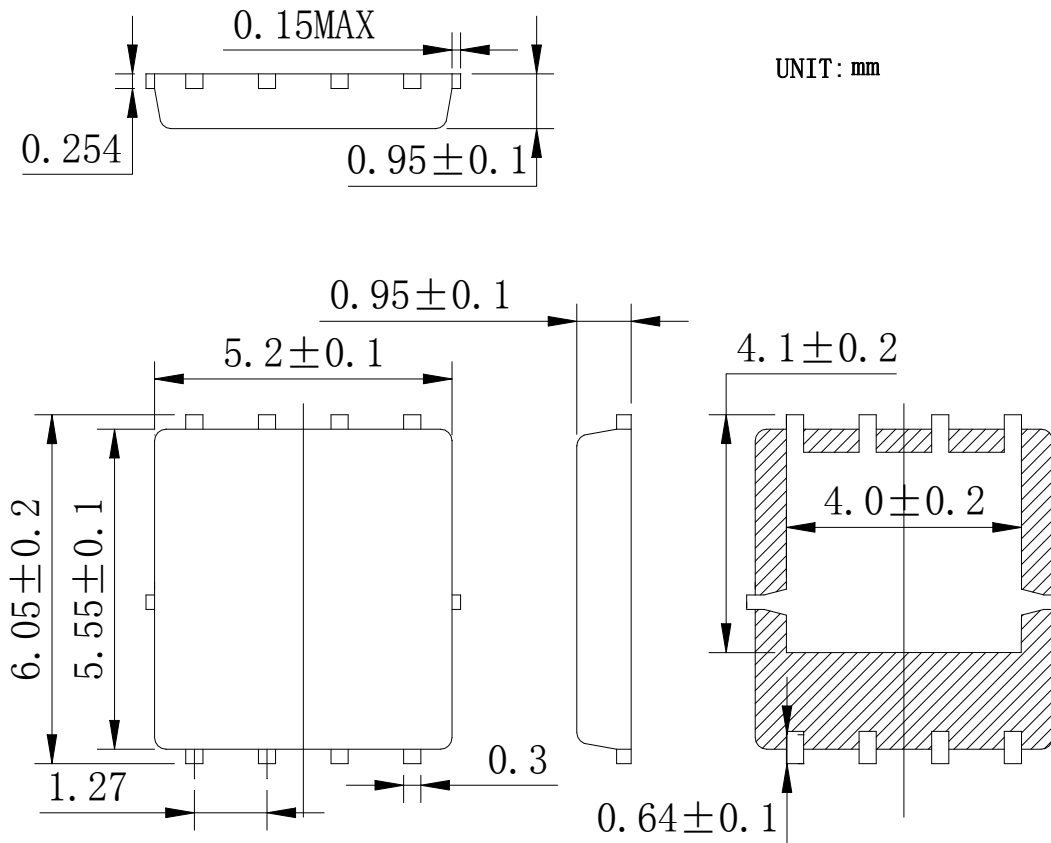


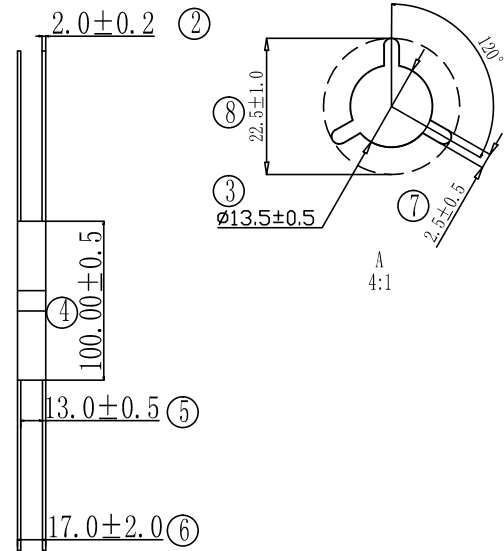
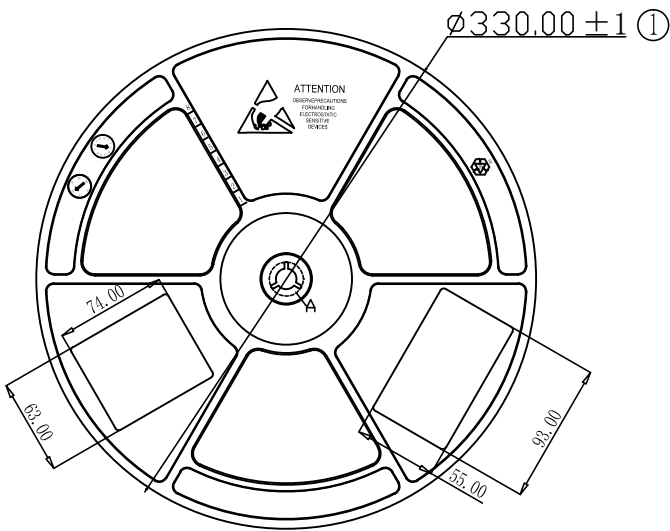
Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

DFN5x6-8C Package Information:

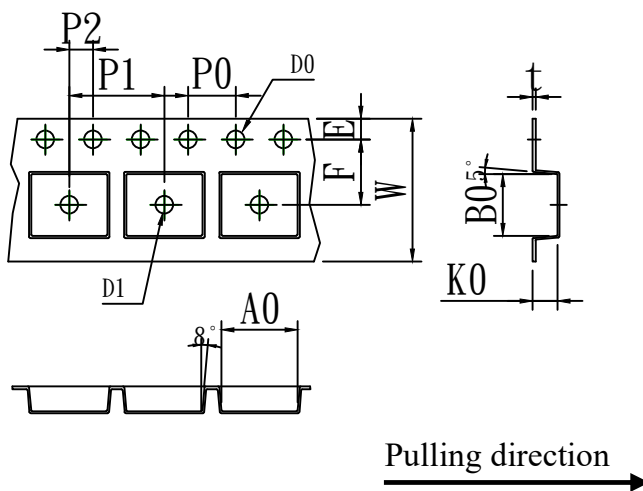


Tape & Reel Information

Dimensions in mm



Symbol	A0	B0	K0	D0	D1	P0	P1	10*P0
Spec	6.15 ± 0.10	5.40 ± 0.10	1.30 ± 0.10	1.55 ± 0.10	1.55 ± 0.10	4.00 ± 0.10	8.00 ± 0.10	40.00 ± 0.10
Symbol	W	E	F	P2	t			
Spec	12.00 ± 0.10	1.75 ± 0.10	5.50 ± 0.10	2.00 ± 0.10	0.20 ± 0.05			



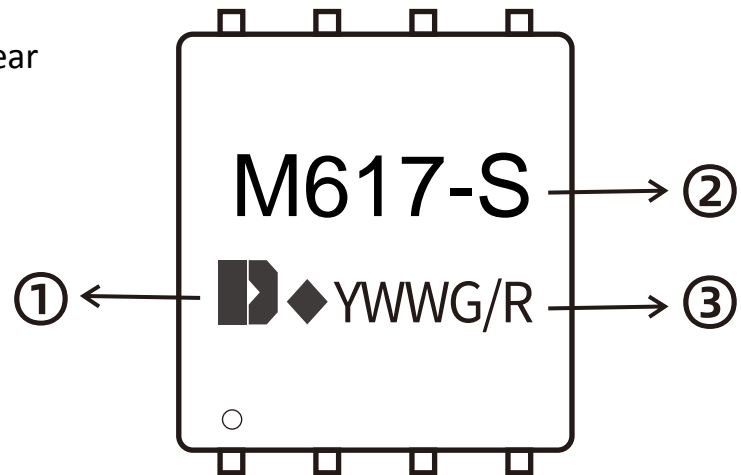
Marking Information:

- ①. Doingter LOGO
- ②. Part NO.
- ③. Date Code(YWWG / R)

Y : Year Code , last digit of the year

WW : Week Code(01-53)


G/R : G(Green) /R(Lead Free)



Previous Version

Version	Date	Subjects (major changes since last revision)
1.0	2025-06-07	Release of final version

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