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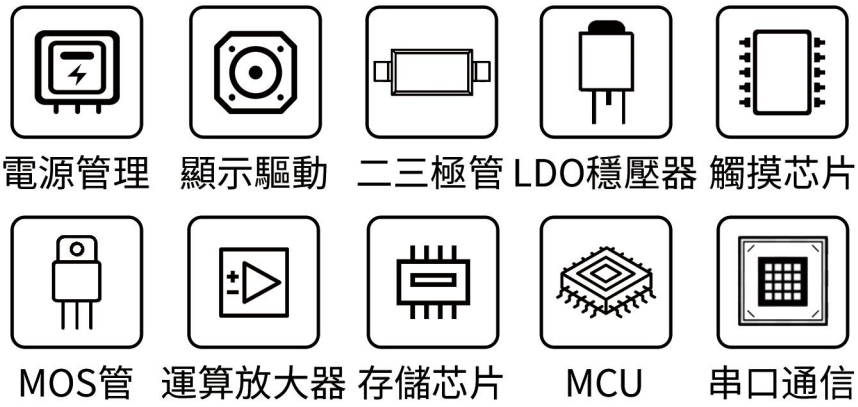


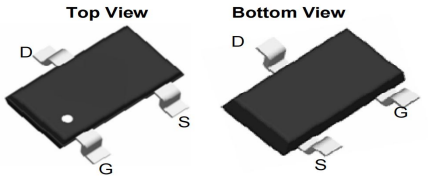
2305-TD

產品規格說明書

Product Summary

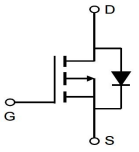
V_{DS}	-18V
I_D (at V_{GS}=-4.5V)	-7.0A
$R_{DS(ON)}$ (at V_{GS}= -4.5V)	< 29mΩ
$R_{DS(ON)}$ (at V_{GS}= -2.5V)	< 37mΩ

SOT23



Features

- Excellent $R_{DS(ON)}$ and Low Gate Charge
- Halogen-free; RoHS-compliant
- Pb-free plating



Applications

- Load Switch
- PWM Application
- Power Management

Absolute Maximum Ratings (@ T_A = 25°C unless otherwise specified)

Symbol	Parameter		Value	Unit
V_{DS}	Drain-to-Source Voltage		-18	V
V_{GS}	Gate-to-Source Voltage		±10	V
I_D	Continuous Drain Current	T_A = 25°C	-7.0	A
		T_A = 100°C	-4.9	
I_{DM}	Pulsed Drain Current [1]		Refer to Fig.4	A
P_D	Power Dissipation	T_A = 25°C	1.2	W
		T_A = 100°C	0.5	
T_J, T_{STG}	Junction & Storage Temperature Range		-55 to 150	℃

Thermal Characteristics

Symbol	Parameter	Max	Unit
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient[3]	150	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient[4]	106	

Electrical Characteristics (T_J = 25°C unless otherwise specified)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	I_D = -250μA, V_{GS} = 0V	-16	-18	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = -12V, V_{GS} = 0V	-	-	1.0	μA
I_{GSS}	Gate-Body Leakage Current	V_{DS} = 0V, V_{GS} = ±10V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = -250μA	-0.3	-0.7	-1.5	V
$R_{DS(ON)}$	Static Drain-Source ON-Resistance(5)	V_{GS} = -4.5V, I_D = -4.1A	-	26	29	mΩ
		V_{GS} = -2.5V, I_D = -3A	-	31	37	mΩ
Dynamic Characteristics						
R_g	Gate Resistance	f = 1MHz	-	11	-	Ω
C_{iss}	Input Capacitance	V_{GS} = 0V, V_{DS} = -6V, f = 1MHz	-	656	-	pF
C_{oss}	Output Capacitance		-	91	-	pF
C_{rss}	Reverse Transfer Capacitance		-	77	-	pF
Q_g	Total Gate Charge	V_{GS} = 0 to -4.5V, V_{DS} = -6V, I_D = -2A	-	10	-	nC
Q_{gs}	Gate Source Charge		-	2	-	nC
Q_{gd}	Gate Drain("Miller") Charge		-	1	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-On DelayTime	V_{GS} = -10V, V_{DD} = -6V, I_D= -2.0A, R_{GEN} = 2.7Ω	-	5	-	ns
t_r	Turn-On Rise Time		-	12	-	ns
$t_{d(off)}$	Turn-Off DelayTime		-	50	-	ns
t_f	Turn-Off Fall Time		-	23	-	ns
Body Diode Characteristics						
I_S	Maximum Continuous Body Diode Forward Current		-	-	-7.0	A
I_{SM}	Maximum Pulsed Body Diode Forward Current		-	-	-16	A
V_{SD}	Body Diode Forward Voltage	V_{GS} = 0V, I_S = -4.1A	-		1.2	V
trr	Body Diode Reverse Recovery Time	I_F = -2A, di/dt = 60A/us	-	9	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	1.3	-	nC

Notes:
1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
2. $R_{\theta JA}$ is measured with the device mounted on a minimum recommended pad of 2oz copper FR4 PCB.
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≤300μs, Duty Cycle≤0.5%.

Typical Performance Characteristics

Figure 1: Power De-rating

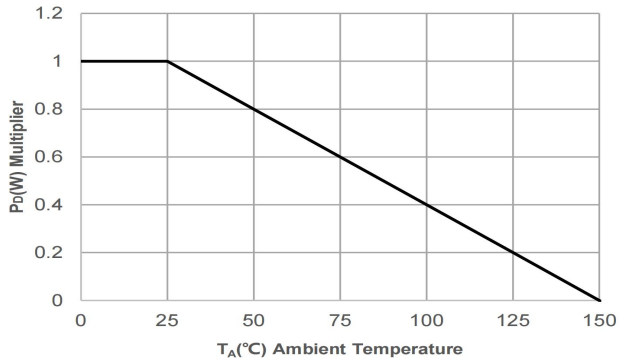


Figure 2: Current De-rating

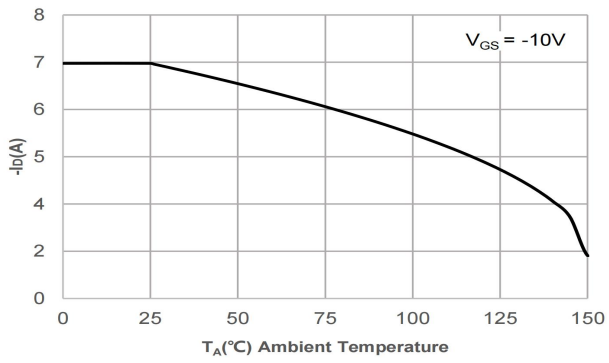


Figure 3: Normalized Maximum Transient Thermal Impedance

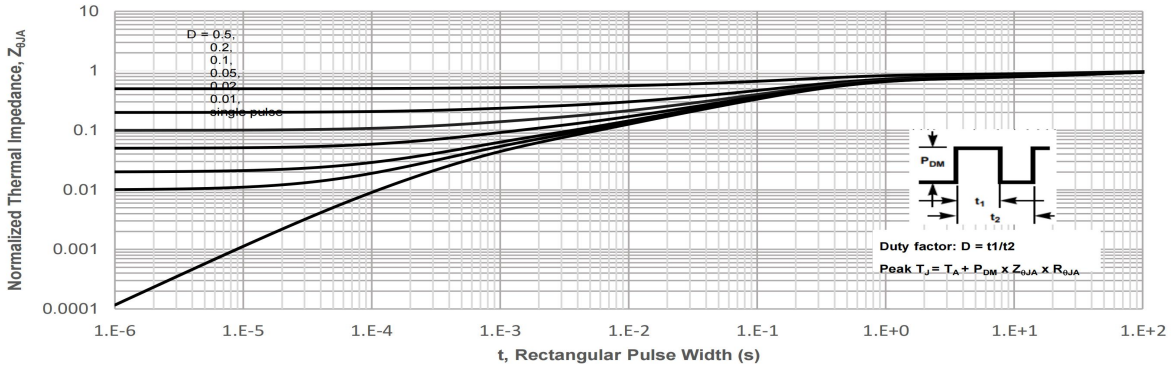
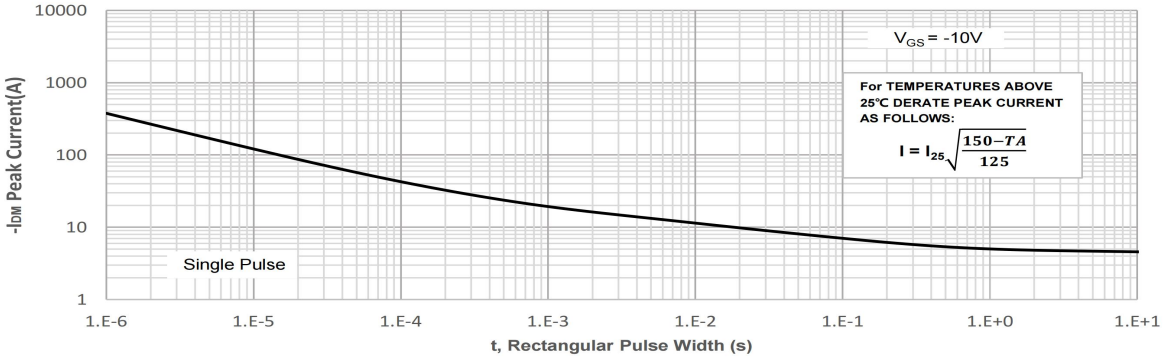


Figure 4: Peak Current Capacity



Typical Performance Characteristics

Figure 5: Output Characteristics

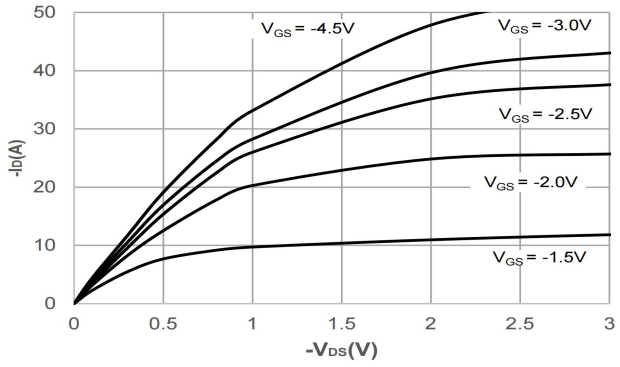


Figure 6: Typical Transfer Characteristics

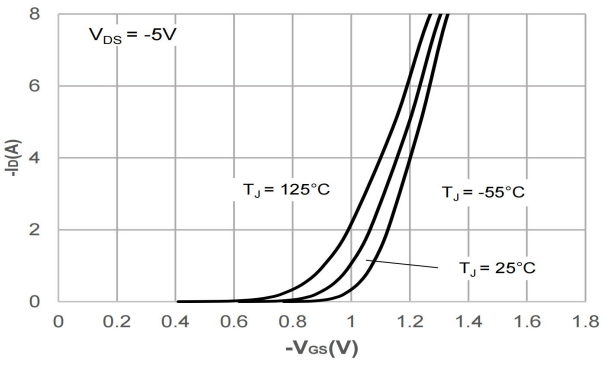


Figure 7: On-resistance vs. Drain Current

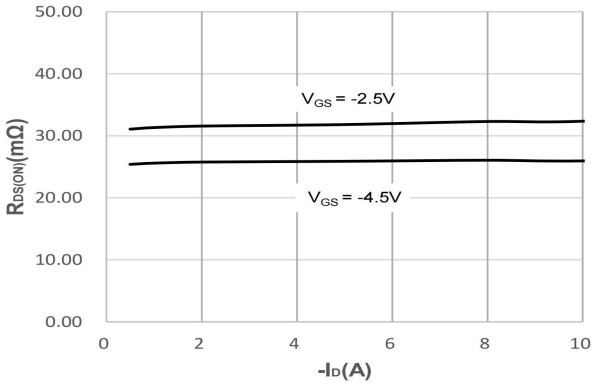


Figure 8: Body Diode Characteristics

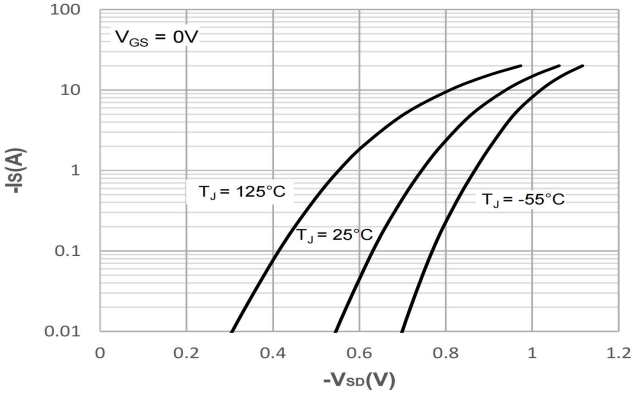


Figure 9: Gate Charge Characteristics

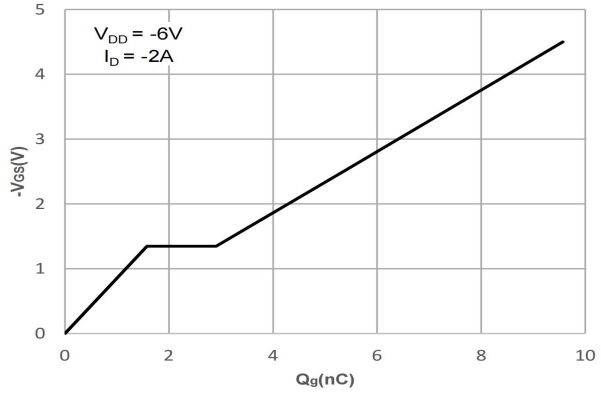
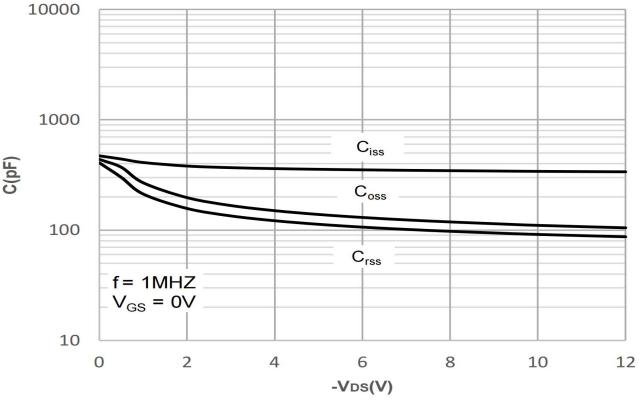


Figure 10: Capacitance Characteristics



Typical Performance Characteristics

Figure 11: Normalized Breakdown voltage vs. Junction Temperature

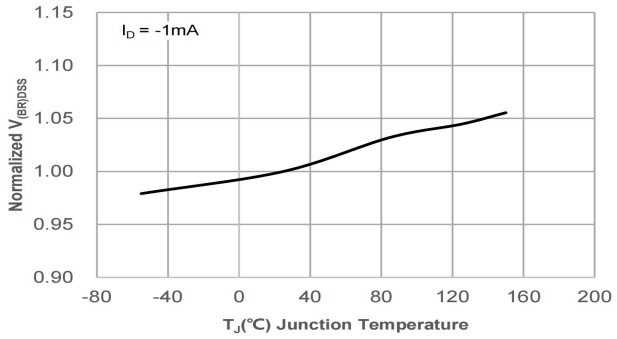


Figure 12: Normalized on Resistance vs. Junction Temperature

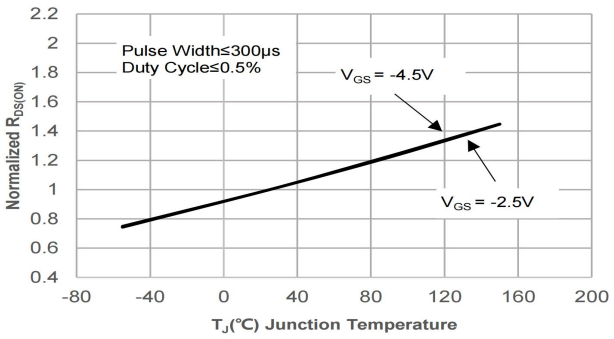


Figure 13: Normalized Threshold Voltage vs. Junction Temperature

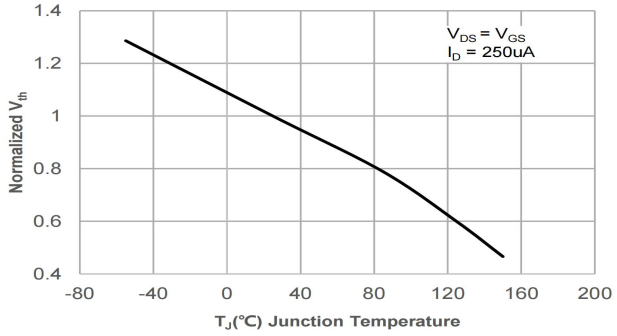


Figure 14: $R_{DS(ON)}$ vs. V_{GS}

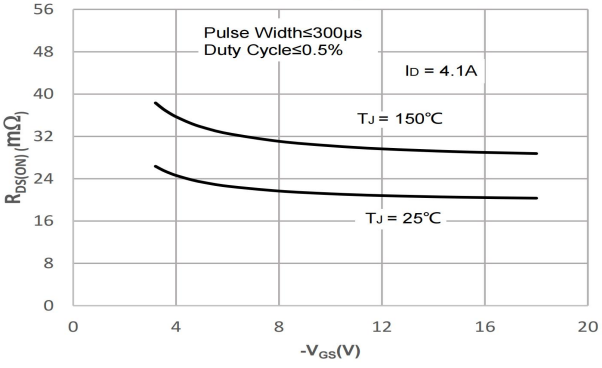
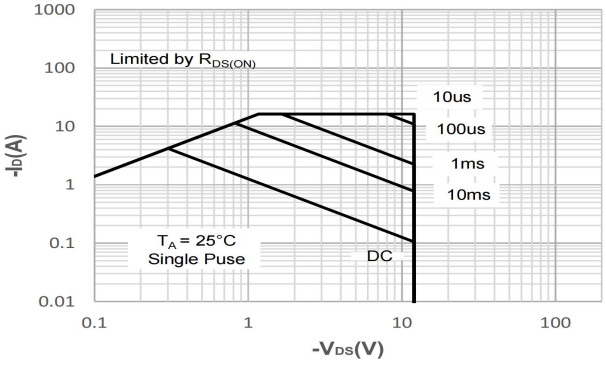


Figure 15: Maximum Safe Operating Area



Test Circuit

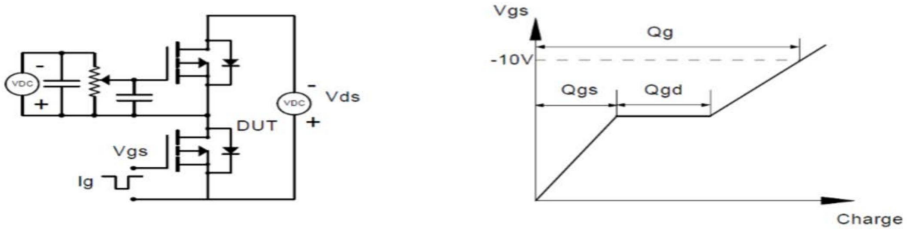


Figure 1: Gate Charge Test Circuit & Waveform

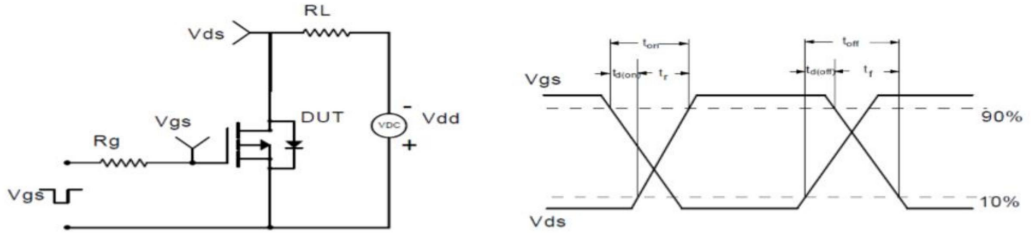


Figure 2: Resistive Switching Test Circuit & Waveform

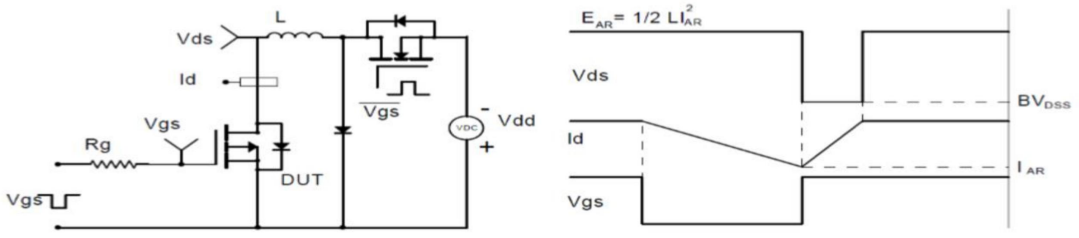


Figure 3: Unclamped Inductive Switching Test Circuit& Waveform

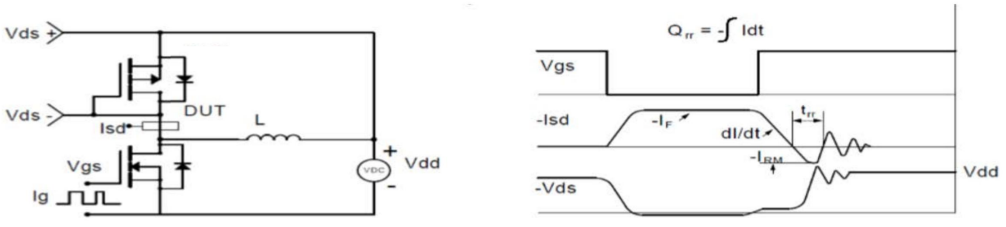
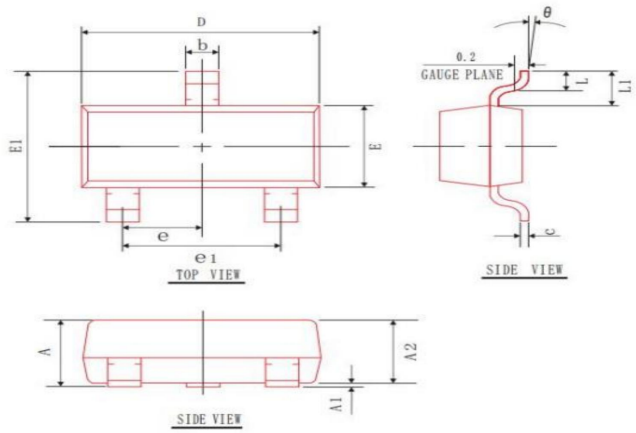


Figure 4: Diode Recovery Test Circuit & Waveform

Package Mechanical Data(SOT-23)



COMMON DIMENSIONS
(UNITS OF MEASURE=mm)

SYMBOL	MIN	NOM	MAX
A	0.90	1.05	1.20
A1	0.00	0.05	0.10
A2	0.90	1.00	1.10
b	0.30	0.40	0.50
c	0.08	0.10	0.15
D	2.80	2.90	3.00
E	1.20	1.30	1.40
E1	2.30	2.40	2.50
L	0.30	0.40	0.50
θ	0°	5°	10°
L1	0.55 REF		
e	0.95 BSC		
e1	1.90 REF		