

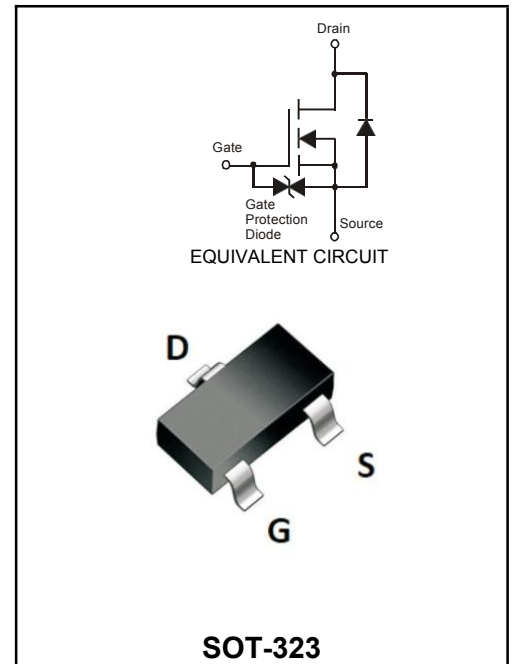
N-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D	0.63A
V_{DSS}	20V
$R_{DS(on)-typ}(@V_{GS}=4.5V)$	$<0.4\Omega$ (Typ:0.3 Ω)
$R_{DS(on)-typ}(@V_{GS}=2.5V)$	$<0.5\Omega$ (Typ:0.4 Ω)
$R_{DS(on)-typ}(@V_{GS}=1.8V)$	$<0.7\Omega$ (Typ:0.5 Ω)

FEATURES

- ◆ Low On-Resistance
- ◆ Low Gate Threshold Voltage
- ◆ Low Input Capacitance
- ◆ Fast Switching Speed
- ◆ Low Input/Output Leakage
- ◆ Lead Free By Design/RoHS Compliant (Note 2)
- ◆ ESD Protected up to 2kV



Marking Code

YFW1012W	NA1
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Maximum Ratings at $T_A=25^\circ\text{C}$ unless otherwise specified

Characteristics	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	± 6	V
Continue Drain Current (note 1)	I_D	$T_A = 25^\circ\text{C}$ 0.63	A
Steady State		$T_A = 85^\circ\text{C}$ 0.45	
Pulsed Drain Current	I_{DM}	6	A
Power Dissipation (note 1)	P_D	0.28	W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	452	$^\circ\text{C/W}$
Operating Temperature Range	T_J	150	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 to +150	$^\circ\text{C}$

Notes:

1. Device mounted on FR-4 PCB.
2. No purposefully added lead.

Maximum Ratings at Ta=25°C unless otherwise specified

Characteristics	Test Condition	Symbo	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	BV_{DSS}	20	-	-	V
Drain-Source Leakage Current	$V_{DS} = 20\text{ V}, V_{GS} = 0\text{ V}, T_J = 25^\circ\text{C}$	I_{DSS}	-	-	100	nA
Gate Leakage Current	$V_{GS} = \pm 4.5\text{ V}, V_{DS} = 0\text{ V}$	I_{GSS}	-	-	± 1.0	μA
Gate-Source Threshold Voltage (note 2)	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	$V_{GS(th)}$	0.5	-	1.0	V
Drain-Source On-State Resistance (note 2)	$V_{GS} = 4.5\text{ V}, I_D = 600\text{ mA}$	$R_{DS(on)}$	-	0.3	0.4	Ω
	$V_{GS} = 2.5\text{ V}, I_D = 500\text{ mA}$		-	0.4	0.5	Ω
	$V_{GS} = 1.8\text{ V}, I_D = 350\text{ mA}$		-	0.5	0.7	Ω
Forward Transfer Admittance	$V_{DS} = 10\text{ V}, I_D = 400\text{ mA}$	$ Y_{fs} $	-	1.4	-	S
Diode Forward Voltage (Note 4)	$I_S = 150\text{ mA}, V_{GS} = 0\text{ V}$	V_{SD}	-	0.7	1.2	V
Input Capacitance	$V_{DS} = 16\text{ V}$ $V_{GS} = 0\text{ V}$ $f = 1\text{ MHz}$	C_{iss}	-	60.67	-	pF
Output Capacitance		C_{oss}	-	9.68	-	pF
Reverse Transfer Capacitance		C_{rss}	-	5.37	-	pF
Total Gate Charge	$V_{GS} = 4.5\text{ V}, V_{DS} = 10\text{ V},$ $I_D = 250\text{ mA}$	Q_g	-	736.6	-	PC
Gate-Source Charge		Q_{gs}	-	93.6	-	PC
Gate-Drain Charge		Q_{gd}	-	116.6	-	PC
Turn-on Delay Time	$V_{DD} = 10\text{ V}, V_{GS} = 4.5\text{ V}$ $R_L = 47\Omega, R_G = 10\Omega$ $I_D = 200\text{ mA}$	$t_{d(on)}$	-	5.1	-	ns
Rise Time		T_r	-	7.4	-	ns
Turn-Off Delay Time		$t_{d(OFF)}$	-	26.7	-	ns
Fall Time		t_f	-	12.3	-	ns

Notes: 4. Short duration pulse test used to minimize self-heating effect.

Typical Characteristics

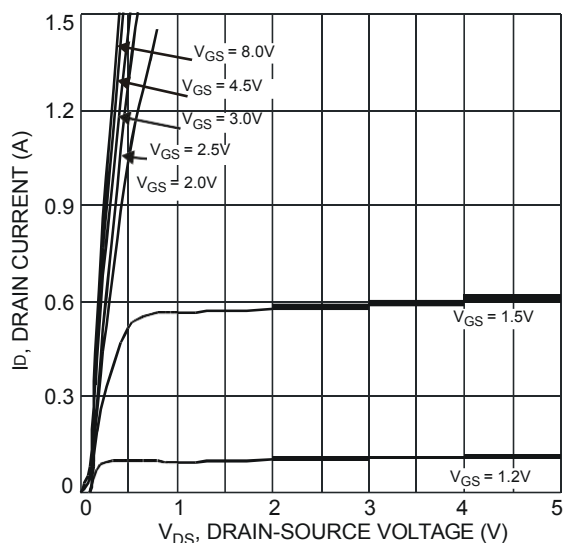


Fig. 1 Typical Output Characteristics

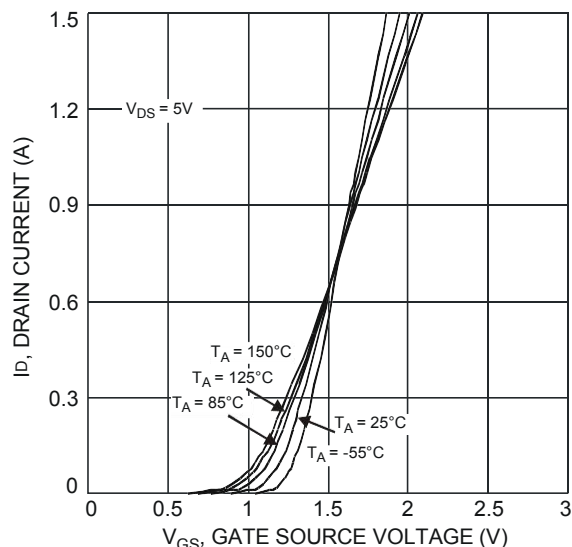


Fig. 2 Typical Transfer Characteristics

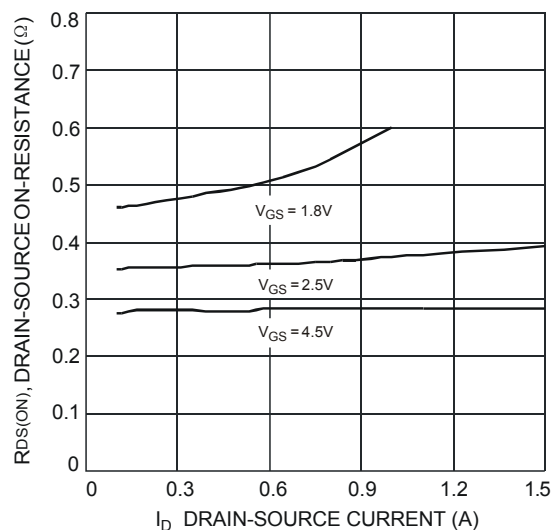


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

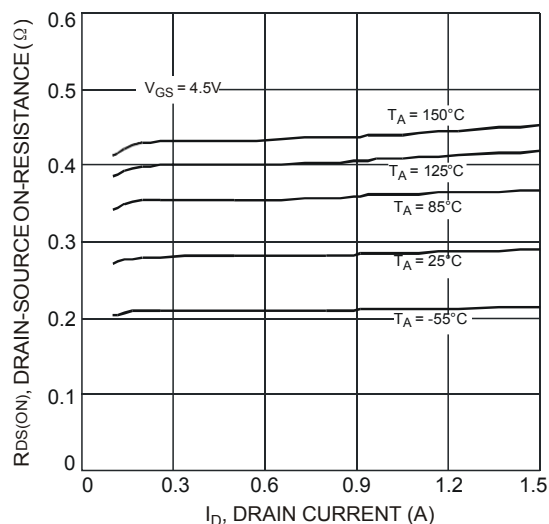


Fig. 4 Typical Drain-Source On-Resistance vs. Drain Current and Temperature

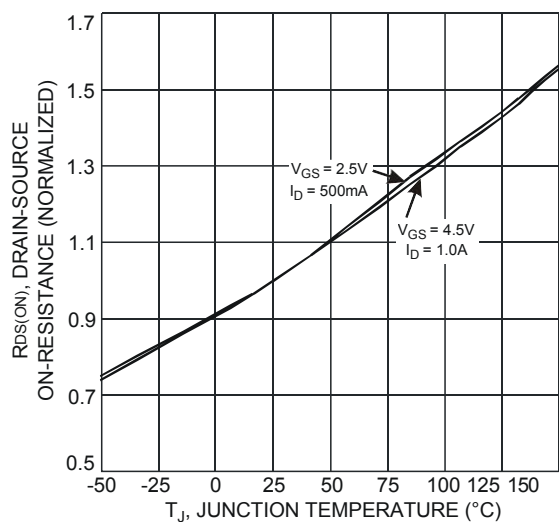


Fig. 5 On-Resistance Variation with Temperature

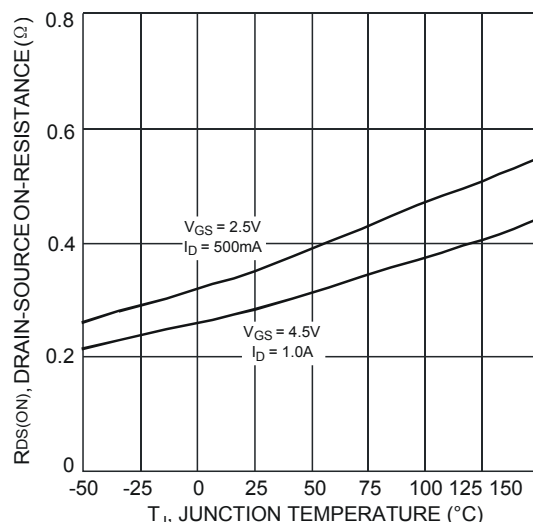


Fig. 6 On-Resistance Variation with Temperature

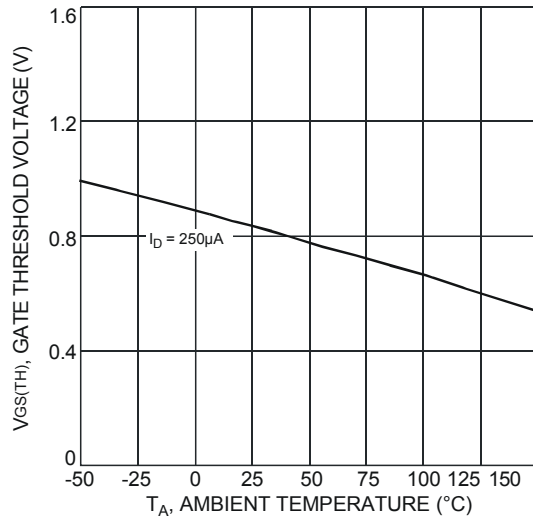


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

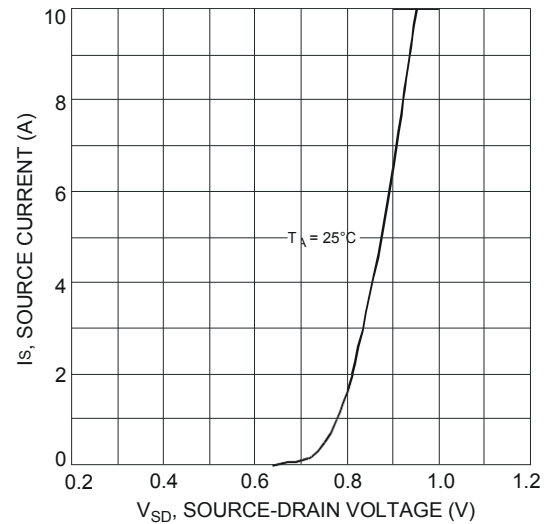


Fig. 8 Diode Forward Voltage vs. Current

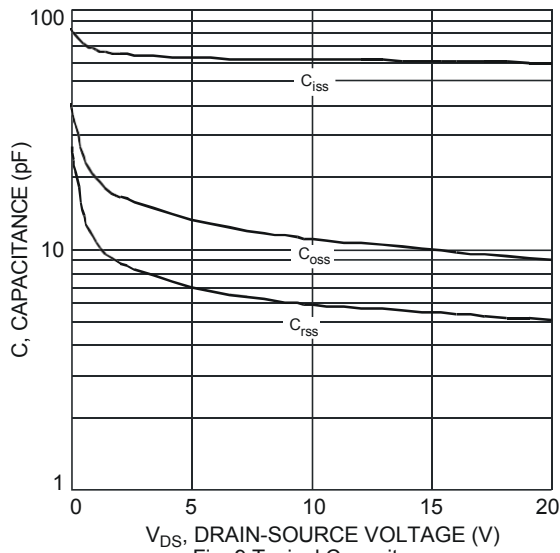


Fig. 9 Typical Capacitance

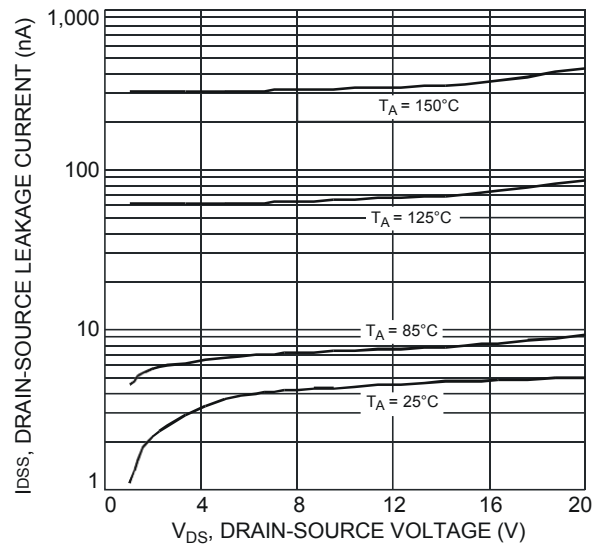


Fig. 10 Typical Drain-Source Leakage Current vs. Drain-Source Voltage

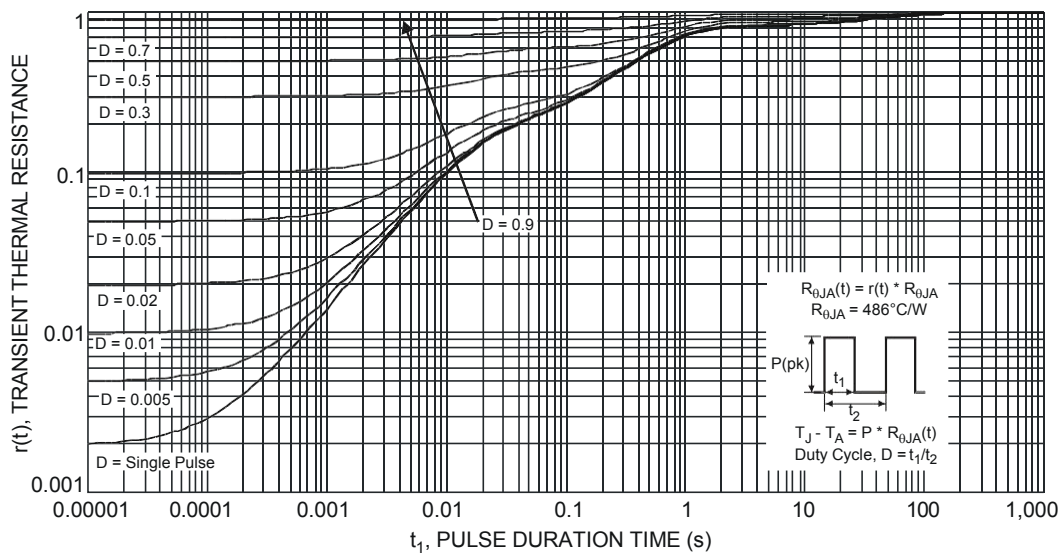


Fig. 11 Transient Thermal Response

Ordering information

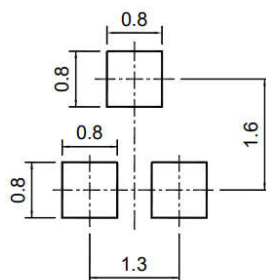
Package	Packing Description	Base Quantity	Packing Quantity
SOT-323	Tape/Reel, 7" reel	3000pcs/Reel	24000PCS/Box 120000PCS/Carton

Package Dimensions

SOT-323

Dim.	Millimeter (mm)		mil	
	Min.	Max.	Min.	Max.
A	0.8	1.1	32	43
A1	0.1		4	
bp	0.3	0.4	12	16
C	0.10	0.25	4	10
D	1.8	2.2	71	87
E	1.15	1.35	45	53
E	1.3		51	
E1	0.65		26	
HE	2.0	2.2	79	87
Lp	0.15	0.45	6	18
Q	0.13	0.23	5.1	9
v	0.2		8	
W	0.2		8	

The recommended mounting pad size



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