


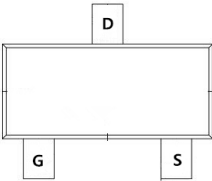
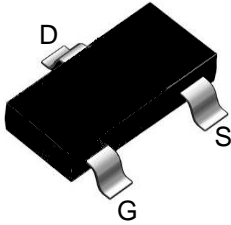
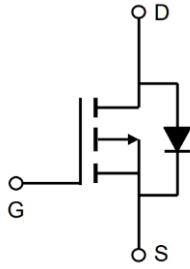


TM002P06I

P-Channel Enhancement Mosfet

<p>General Description</p> <ul style="list-style-type: none"> • Low $R_{DS(ON)}$ • RoHS and Halogen-Free Compliant <p>Applications</p> <ul style="list-style-type: none"> • Load switch • PWM 	<p>General Features</p> <p>$V_{DS} = -60V$ $I_D = -200mA$</p> <p>$R_{DS(ON)} = 3.6 \Omega (typ.) @ V_{GS} = -10V$</p> <p>100% UIS Tested 100% R_g Tested</p> 
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I:SOT-23

Marking: PD

Absolute Maximum Ratings ($T = 25^\circ C$ Unless Otherwise Noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	-60	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current ¹	-200	mA
P_D	Power Dissipation ¹	300	mW
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	$^\circ C$

Thermal Data

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case ¹	---	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient ¹	41	



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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = -250\mu A$	BV_{DSS}	-60	--	--	V
Gate Threshold Voltage	$V_{GS} = V_{DS}, I_D = -250\mu A$	$V_{GS(TH)}$	-0.9	-1.5	-2.0	V
Gate-Source Leakage Current	$V_{GS} = \pm 20V, V_{DS} = 0V$	I_{GSS}	--	--	± 100	nA
Drain-Source Leakage Current	$V_{GS} = 0V, V_{DS} = -60V$	I_{DSS}	--	--	-1	μA
	$V_{GS} = 0V, V_{DS} = -60V$ $T_J = 125^{\circ}\text{C}$		--	--	-150	
Drain-Source On-State Resistance (Note 3)	$V_{GS} = -10V, I_D = -150mA$	$R_{DS(on)}$	--	3.6	6	Ω
	$V_{GS} = -4.5V, I_D = -130mA$		--	4.2	8	
Forward Transconductance (Note 3)	$V_{DS} = -5V, I_D = -150mA$	g_{fs}	--	0.5	--	S
Dynamic (Note 3)						
Total Gate Charge	$V_{GS} = -10V, V_{DS} = -30V,$ $I_D = -150mA$	Q_g	--	1.9	--	nC
Total Gate Charge	$V_{GS} = -4.5V, V_{DS} = -30V,$ $I_D = -130mA$	Q_g	--	1	--	
Gate-Source Charge		Q_{gs}	--	0.3	--	
Gate-Drain Charge		Q_{gd}	--	0.3	--	
Input Capacitance	$V_{GS} = 0V, V_{DS} = -30V$ $f = 1.0MHz$	C_{iss}	--	37	--	pF
Output Capacitance		C_{oss}	--	15	--	
Reverse Transfer Capacitance		C_{rss}	--	7	--	
Switching (Note 3)						
Turn-On Delay Time	$V_{GS} = -10V, V_{DS} = -30V,$ $I_D = -150mA, R_G = 6\Omega$	$t_{d(on)}$	--	10	--	ns
Turn-On Rise Time		t_r	--	15	--	
Turn-Off Delay Time		$t_{d(off)}$	--	21	--	
Turn-Off Fall Time		t_f	--	78	--	
Source-Drain Diode						
Forward Voltage (Note 2)	$V_{GS} = 0V, I_S = -150mA$	V_{SD}	--	--	-1.2	V
Reverse Recovery Time	$I_S = -150mA,$	t_{rr}	--	24	--	ns
Reverse Recovery Charge	$di/dt = 100A/\mu s$	Q_{rr}	--	14	--	nC

Notes:

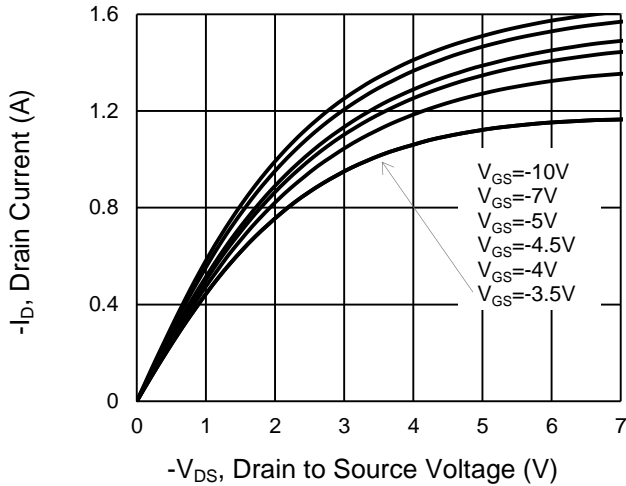
1. Silicon limited current only.
2. Pulse test: Pulse Width $\leq 300\mu s$, duty cycle $\leq 2\%$.
3. Switching time is essentially independent of operating temperature.



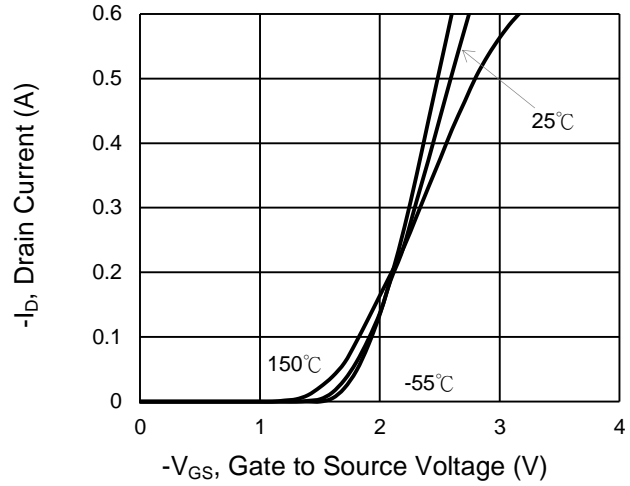
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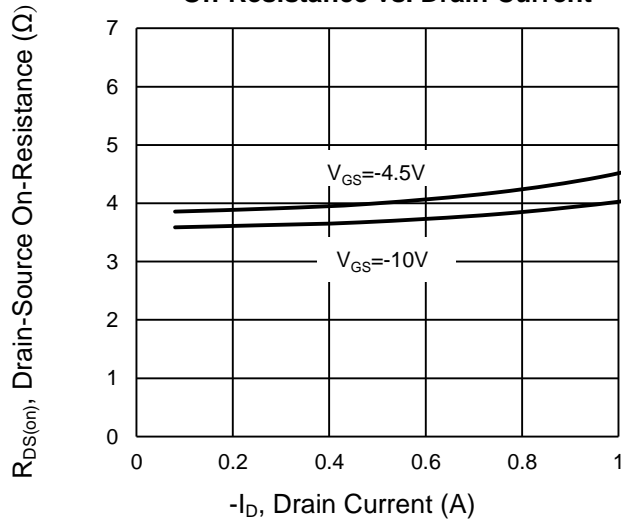
Output Characteristics



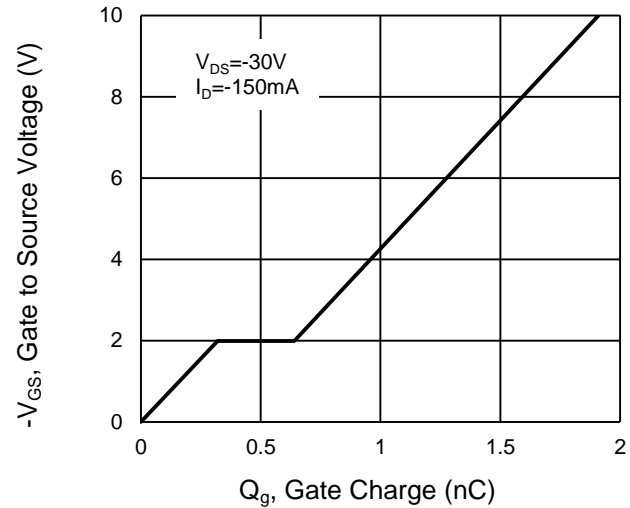
Transfer Characteristics



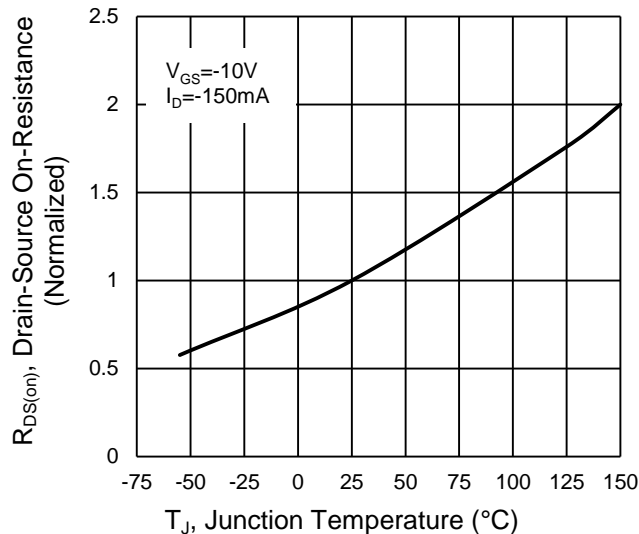
On-Resistance vs. Drain Current



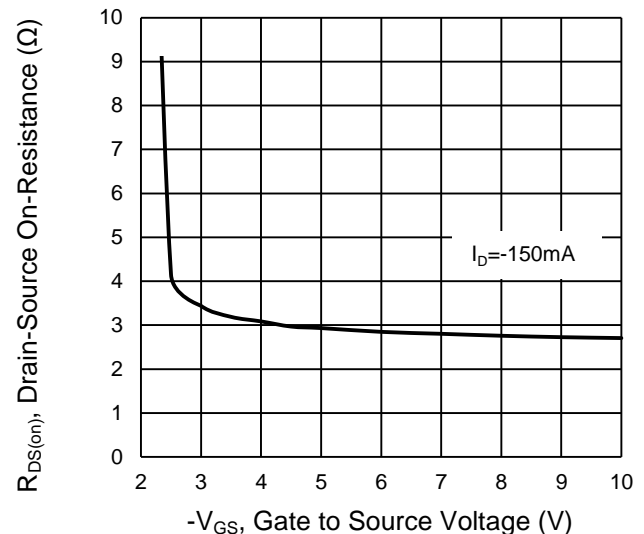
Gate-Source Voltage vs. Gate Charge



On-Resistance vs. Junction Temperature



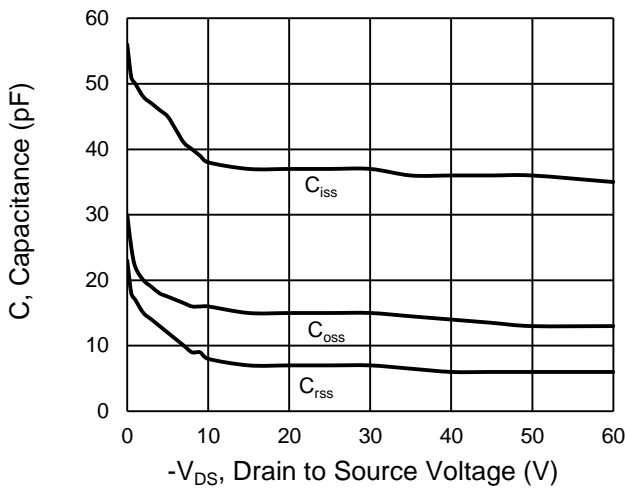
On-Resistance vs. Gate-Source Voltage



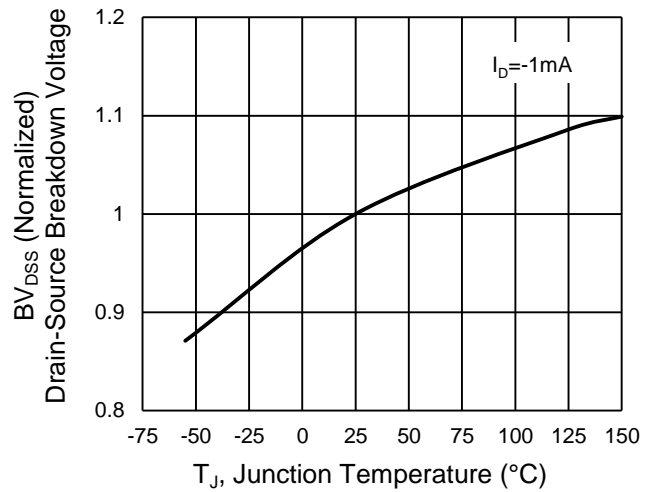
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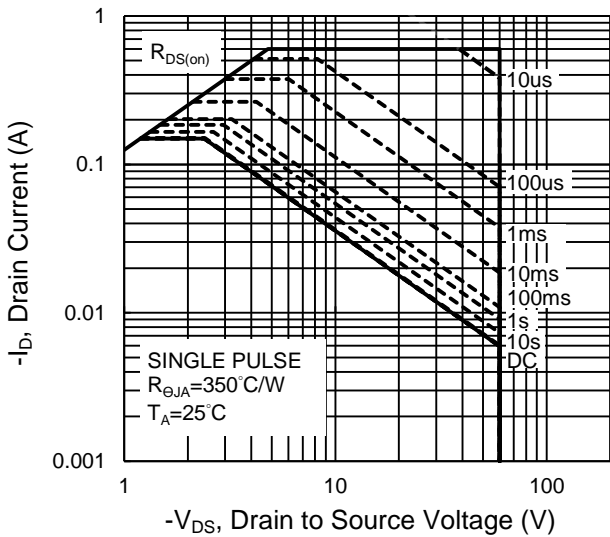
Capacitance vs. Drain-Source Voltage



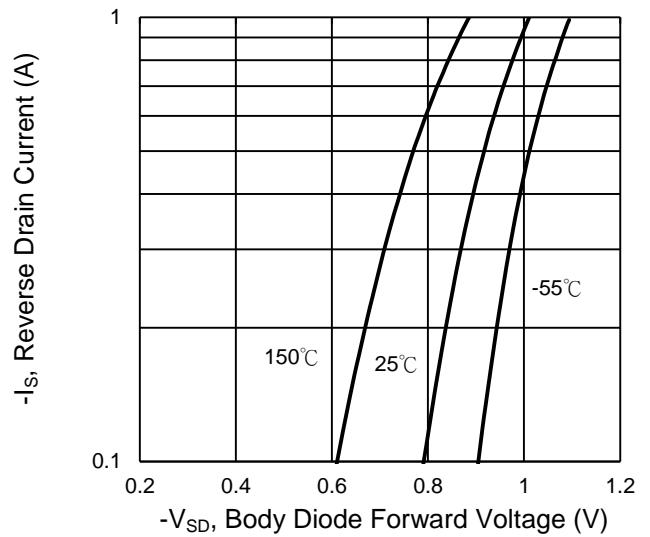
BV_{DSS} vs. Junction Temperature



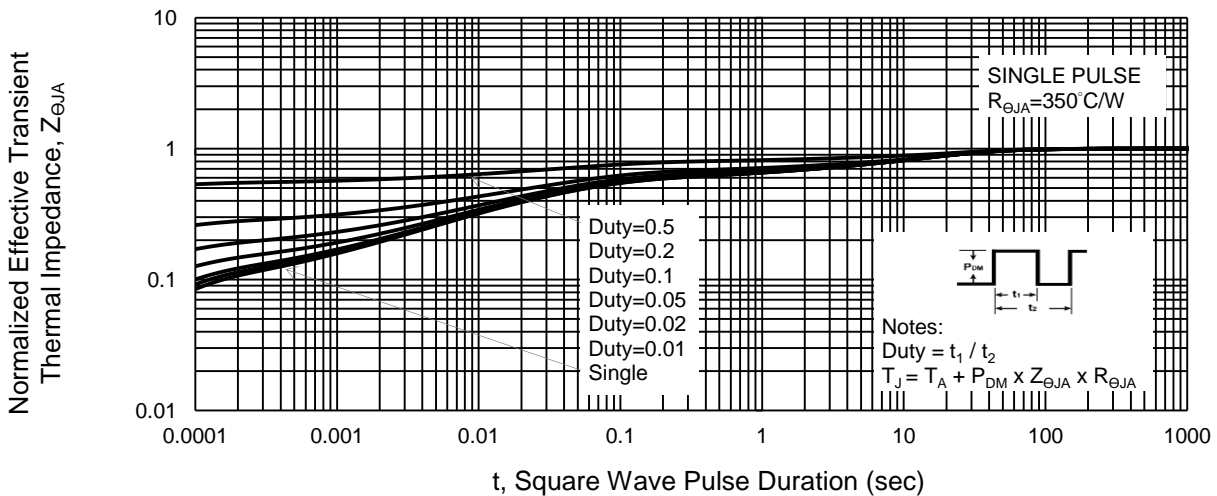
Maximum Safe Operating Area, Junction-to-Ambient



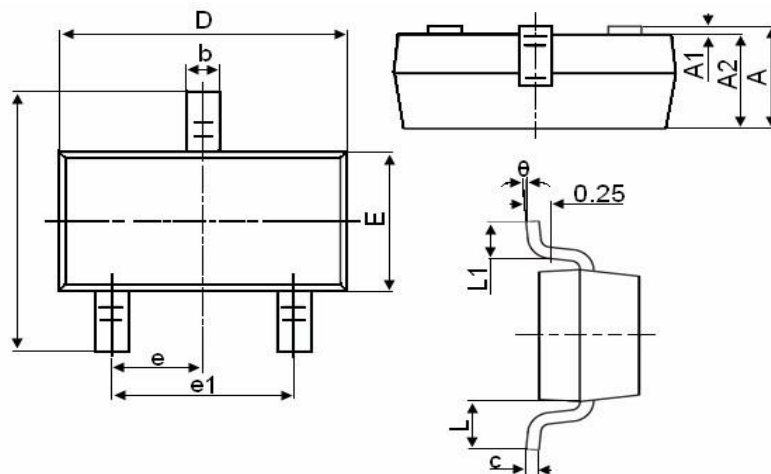
Source-Drain Diode Forward Current vs. Voltage



Normalized Thermal Transient Impedance, Junction-to-Ambient



Package Mechanical Data:SOT-23



Symbol	Dimensions in Millimeters	
	MIN.	MAX.
A	0.900	1.150
A1	0.000	0.100
A2	0.900	1.050
b	0.300	0.500
c	0.080	0.150
D	2.800	3.000
E	1.200	1.400
E1	2.250	2.550
e	0.950TYP	
e1	1.800	2.000
L	0.550REF	
L1	0.300	0.500
θ	0°	8°