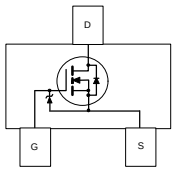
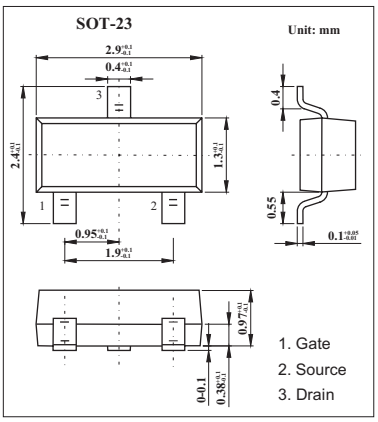
Digital FET, N-Channel

KDV303N

■ Features

- 0.68 A, 25 V. $R_{DS(ON)}$ = 0.45 Ω @ V_{GS} = 4.5 V
  $R_{DS(ON)}$ = 0.6Ω @ V_{GS} = 2.7 V.
- Very low level gate drive requirements allowing direct operation in 3V circuits. $V_{GS(th)}$ < 1.5V.
- Gate-Source Zener for ESD ruggedness.
  ＞6kV Human Body Model





■ Absolute Maximum Ratings Ta = 25℃

Parameter	Symbol	Rating	Unit
Drain to Source Voltage	V_{DSS}	25	V
Gate to Source Voltage	V_{GSS}	8	V
Drain Current- Continuous	I_D	0.68	A
Drain Current- pulse		2	A
Power Dissipation for Single Operation	P_D	0.35	W
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-55 to +150	℃
Thermal Resistance, Junction-to- Ambient	$R_{\theta JA}$	357	℃/W

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■ Electrical Characteristics Ta = 25℃

Parameter	Symbol	Testconditons	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{DSS}	V_{GS} = 0 V, I_D = 250 μA	25			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} =20 V, V_{GS} = 0 V			1	μA
		V_{DS} =20 V, V_{GS} = 0 V,T_J=55℃			10	μA
Gate-Body Leakage Current,Forward	I_{GSSF}	V_{GS} = 8V, V_{DS} = 0 V			100	nA
Gate-Body Leakage Current,Reverse	I_{GSSR}	V_{GS} = -8 V, V_{DS} = 0 V			-100	nA
Gate Threshold Voltage *	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 μA	0.65	0.8	1.5	V
Static Drain-Source On-Resistance*	$R_{DS(on)}$	V_{GS} = 4.5V, I_D =0.5A		0.33	0.45	Ω
		V_{GS} = 4.5V, I_D = 0.2A, T_J =125℃		0.52	0.8	Ω
		V_{GS} = 2.7V, I_D =0.2 A		0.44	0.6	Ω
On-State Drain Current *	$I_{D(on)}$	V_{GS} = 2.7 V, V_{DS} =5 V	0.5			A
Forward Transconductance *	g_{FS}	V_{DS} = 5V, I_D = 0.5 A		1.45		S
Input Capacitance	C_{iss}	V_{DS} = 10 V,		50		pF
Output Capacitance	C_{oss}	V_{GS} = 0 V,		28		pF
Reverse Transfer Capacitance	C_{rss}	f = 1.0 MHz		9		pF
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 6V, I_D =0.5A,		3	6	ns
Turn-On Rise Time	t_r	V_{GS} = 4.5V, R_{GEN} = 50Ω		8.5	18	ns
Turn-Off Delay Time	$t_{d(off)}$			17	30	ns
Turn-Off Fall Time	t_f			13	25	ns
Total Gate Charge	Q_g	V_{DS} = 5 V, I_D = 0.5A,		1.64	2.3	nC
Gate-Source Charge	Q_{gs}	V_{GS} = 4.5V,		0.38		nC
Gate-Drain Charge	Q_{gd}			0.45		nC
Maximum Continuous Drain-Source Diode Forward Current	I_S				0.3	A
Drain-Source Diode ForwardVoltage	V_{SD}	V_{GS} = 0 V, I_S = 0.5 A		0.83	1.2	V

* Pulse Test: Pulse Width ＜ 300μs, Duty Cycle ＜ 2.0%.

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■ Typical Characteristics

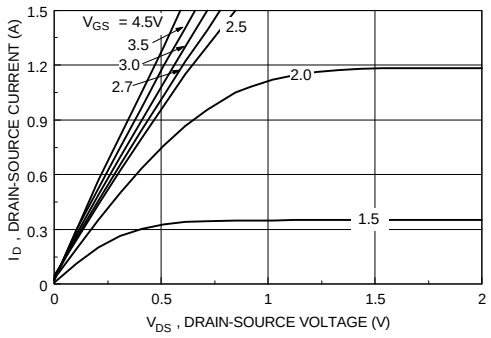

Figure 1. On-Region Characteristics.

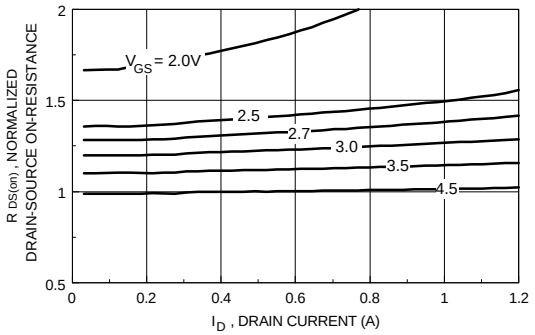

Figure 2. On-Resistance Variation with Drain Current and Gate Voltage.

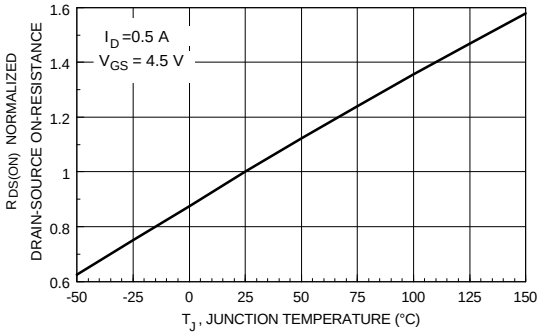

Figure 3. On-Resistance Variation with Temperature.

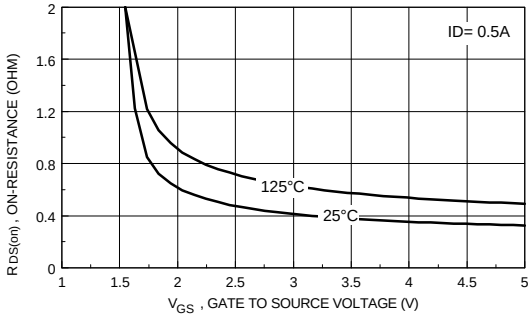

Figure 4. On Resistance Variation with Gate-To- Source Voltage.

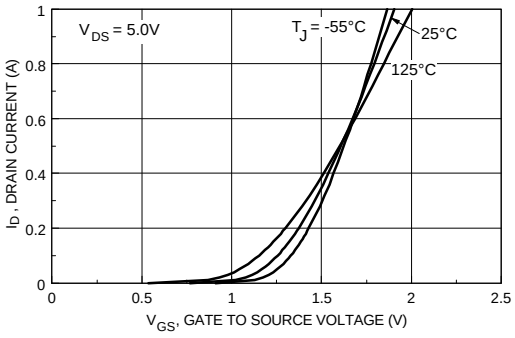

Figure 5. Transfer Characteristics.

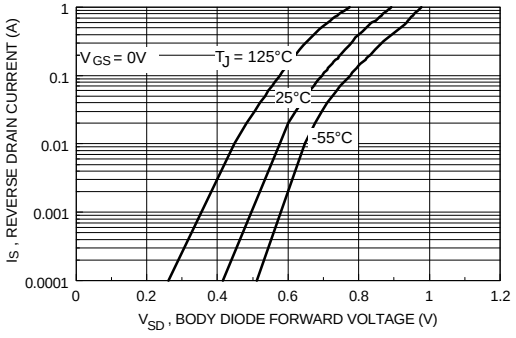

Figure 6. Body Diode Forward Voltage Variation with Source Current and Temperature.

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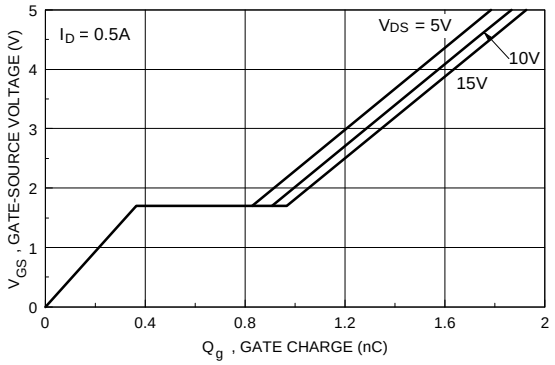

Figure 7. Gate Charge Characteristics.

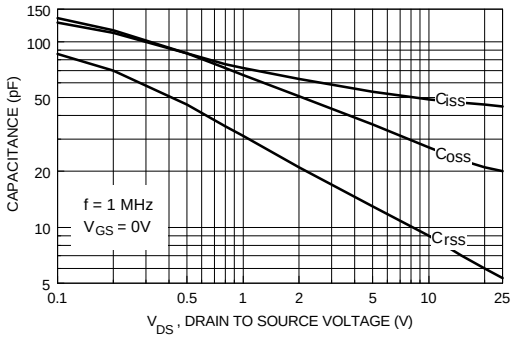

Figure 8. Capacitance Characteristics.

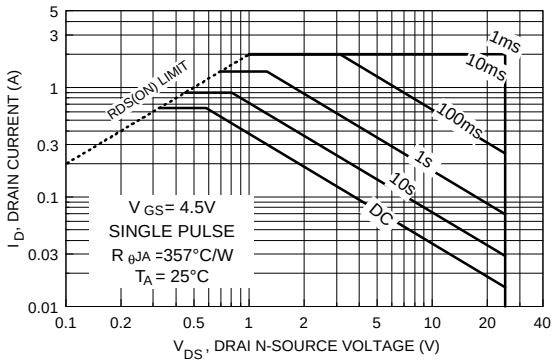

Figure 9. Maximum Safe Operating Area.

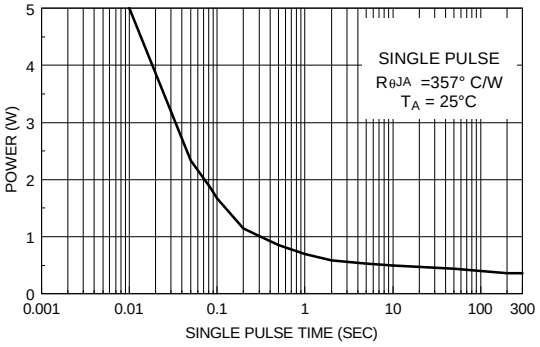

Figure 10. Single Pulse Maximum Power Dissipation.

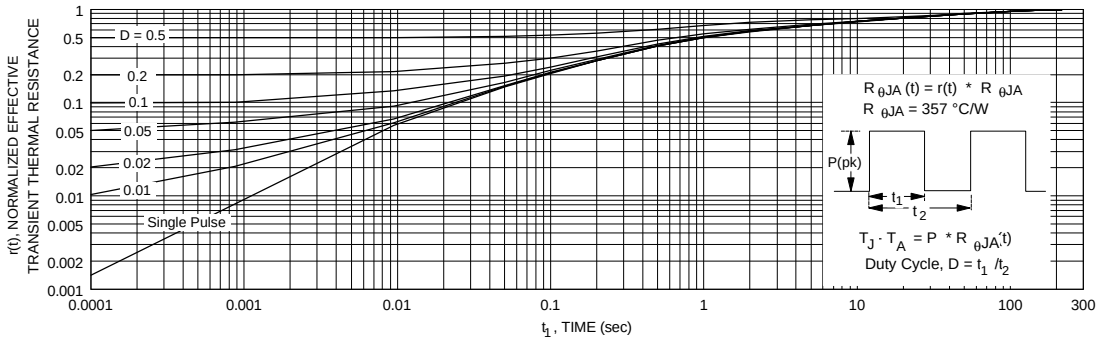

Figure 11. Transient Thermal Response Curve.