



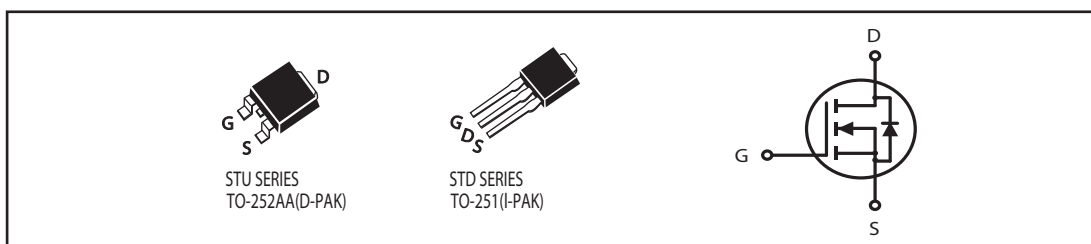
N-Channel Logic Level Enhancement Mode Field Effect Transistor

PRODUCT SUMMARY

V _{DSS}	I _D	R _{DS(ON)} (mΩ) Max
40V	50A	9 @ V _{GS} = 10V

FEATURES

- Super high dense cell design for low R_{DS(ON)}.
- Rugged and reliable.
- TO-252 and TO-251 Package.



ABSOLUTE MAXIMUM RATINGS (TC=25°C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V _{DS}	40	V
Gate-Source Voltage	V _{GS}	±20	V
Drain Current-Continuous ^a @Ta	I _D	50	A
-Pulsed ^b			
Drain-Source Diode Forward Current ^a	I _S	20	A
Avalanche Current ^c	I _{AS}	23	A
Avalanche Energy ^c	E _{AS}	130	mJ
Maximum Power Dissipation ^a	P _D	50	W
Ta=25°C			
Operating Junction and Storage Temperature Range	T _J , T _{STG}	-55 to 175	°C

THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Case	R _{θJC}	3	°C/W
Thermal Resistance, Junction-to-Ambient	R _{θJA}	50	°C/W

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ELECTRICAL CHARACTERISTICS (T_C=25 °C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D = 250uA	40			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 32V, V _{GS} = 0V			1	uA
Gate-Body Leakage	I _{GSS}	V _{GS} = ±20V, V _{DS} = 0V			±100	nA
ON CHARACTERISTICS ^a						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250uA	1.25	1.6	3	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} = 10V, I _D = 10A		7	9	mohm
		V _{GS} = 4.5V, I _D = 5A		9	11	mohm
On-State Drain Current	I _{D(ON)}	V _{DS} = 10V, V _{GS} = 10V	30			A
Forward Transconductance	g _{FS}	V _{DS} = 10V, I _D = 10A		28		S
DYNAMIC CHARACTERISTICS ^b						
Input Capacitance	C _{ISS}	V _{DS} = 15V, V _{GS} = 0V f = 1.0MHz		1130		pF
Output Capacitance	C _{OSS}			240		pF
Reverse Transfer Capacitance	C _{RSS}			145		pF
SWITCHING CHARACTERISTICS ^b						
Turn-On Delay Time	t _{D(ON)}	V _{DD} = 15V I _D = 10 A V _{GS} = 10V R _{GEN} = 3.3 ohm		18		ns
Rise Time	t _r			22		ns
Turn-Off Delay Time	t _{D(OFF)}			61		ns
Fall Time	t _f			9.6		ns
Total Gate Charge	Q _g	V _{DS} = 15V, I _D = 10A, V _{GS} = 10V		23.5		nC
		V _{DS} = 15V, I _D = 10A, V _{GS} = 4.5V		11.5		nC
Gate-Source Charge	Q _{gs}	V _{DS} = 15V, I _D = 10A V _{GS} = 10V		2.7		nC
Gate-Drain Charge	Q _{gd}			3.2		nC

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ELECTRICAL CHARACTERISTICS ($T_C=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
DRAIN-SOURCE DIODE CHARACTERISTICS ^a						
Diode Forward Voltage	V_{SD}	$V_{GS} = 0V, I_S = 20A$		0.91	1.3	V

Notes

- a. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
- b. Guaranteed by design, not subject to production testing.
- c. Starting $T_J=25^\circ\text{C}$, $L=0.5\text{ mH}$, $R_G=25\Omega$, $I_{AS} = 23A$, $V_{DD} \leq V_{(BR)DSS}$ (See Figure13)

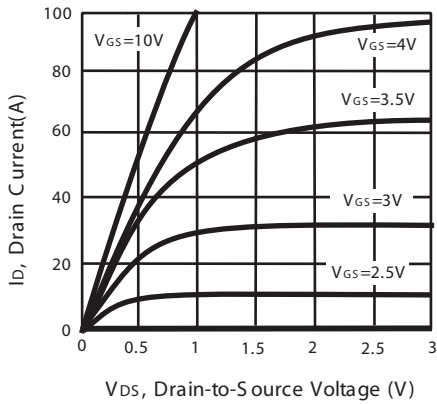


Figure 1. Output Characteristics

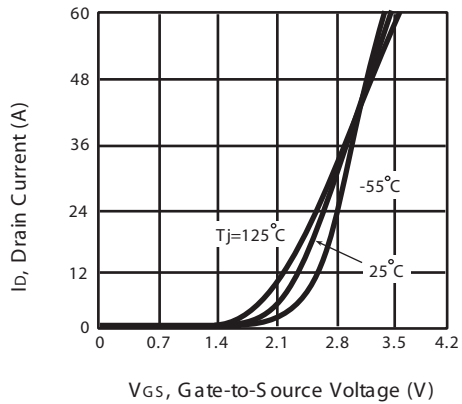


Figure 2. Transfer Characteristics

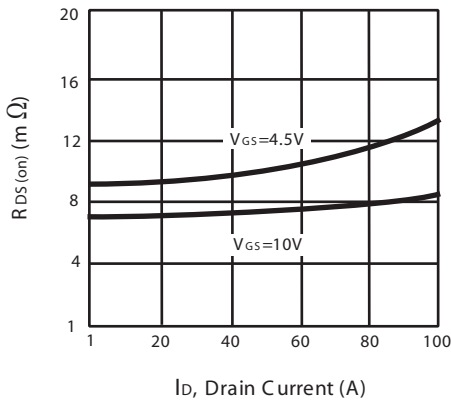


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

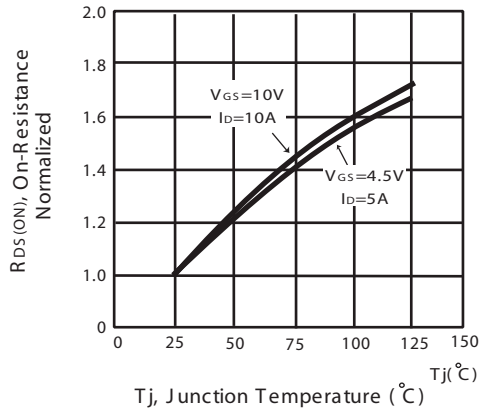


Figure 4. On-Resistance Variation with Drain Current and Temperature

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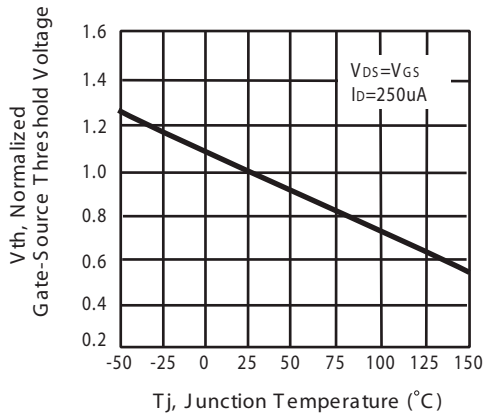


Figure 5. Gate Threshold Variation with Temperature

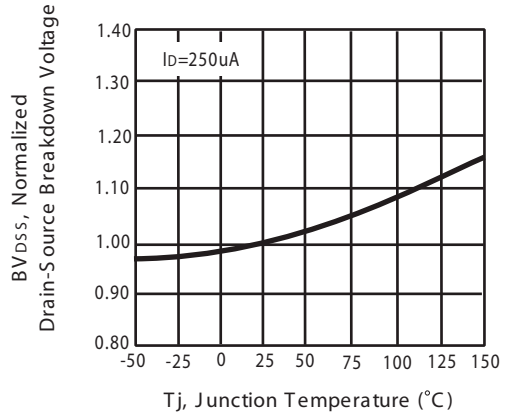


Figure 6. Breakdown Voltage Variation with Temperature

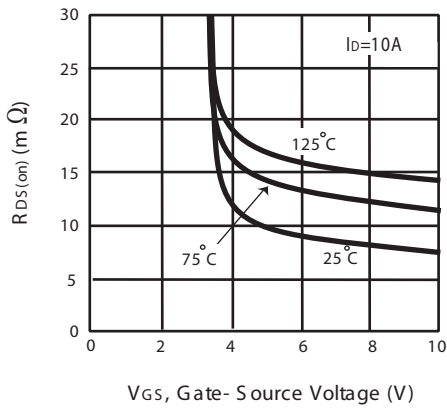


Figure 7. On-Resistance vs. Gate-Source Voltage

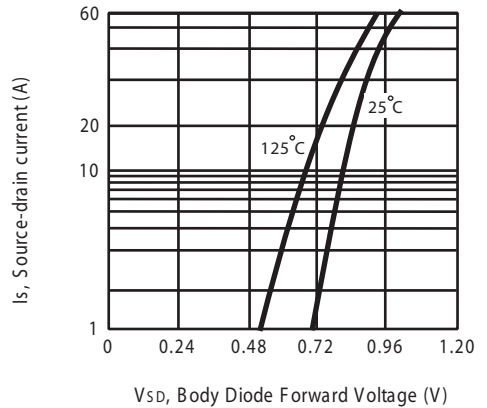


Figure 8. Body Diode Forward Voltage Variation with Source Current

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