

**N Channel MOSFET**

**M04N60**

**4.0A**



TO-220

- Robust High Voltage Termination
- Avalanche Energy Specified
- Source-to-Drain Diode Recovery Time Comparable to a Discrete Fast Recovery Diode

**MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS ( Ta=25 )**

PARAMETERS	SYMBOL	MIN	TYP	MAX	UNITS	CONDITION
Continuous Drain Current	$I_D$			3.6	A	$V_{GS} = 10\text{ V}, T_a = 25$
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	600			V	$V_{GS} = 0\text{ V}, I_D = 250\ \mu\text{ A}$
Drain-Source Leakage Current	$I_{DSS}$			0.1 0.5	mA	$V_{DS} = 600\text{ V}, V_{GS} = 0\text{ V}$ $V_{DS} = 480\text{ V}, V_{GS} = 0\text{ V}, T_J = 125$
Gate-Source Leakage Current-Forward	$I_{GSSF}$			100	nA	$V_{gsf} = 20\text{ V}, V_{DS} = 0\text{ V}$
Gate-Source Leakage Current-Reverse	$I_{GSSR}$			100	nA	$V_{gsr} = 20\text{ V}, V_{DS} = 0\text{ V}$
Gate Threshold Voltage	$V_{GS(th)}$	2.0		4.0	V	$V_{DS} = V_{GS}, I_D = 250\ \mu\text{ A}$
Static Drain-Source On-Resistance	$R_{DS(on)}$			2.2	$\Omega$	$V_{GS} = 10\text{ V}, I_D = 2.2\text{ A}^*$
Forward Transconductance	$g_{FS}$	2.5			S	$V_{DS} = 50\text{ V}, I_D = 2.2\text{ A}^*$
Input Capacitance	$C_{iss}$		660		pF	$V_{DS} = 25\text{ V}, V_{GS} = 0\text{ V}, f = 1.0\text{ MHz}$
Output Capacitance	$C_{oss}$		86		pF	
Reverse Transfer Capacitance	$C_{rss}$		19		pF	
Turn-On Delay Time	$t_{d(on)}$		11		ns	$V_{DD} = 300\text{ V}, I_D = 3.6\text{ A}, V_{GS} = 10\text{ V},$ $R_G = 12\ \Omega^*$
Rise Time	$t_r$		13		ns	
Turn-Off Delay Time	$t_{d(off)}$		35		ns	
Fall Time	$t_f$		14		ns	
Total Gate Charge	$Q_g$			31	nC	$V_{DS} = 360\text{ V}, I_D = 3.6\text{ A}, V_{GS} = 10\text{ V}^*$
Gate-Source Charge	$Q_{gs}$			4.6	nC	
Gate-Drain Charge	$Q_{gd}$			17	nC	
Internal Drain Inductance	$L_D$		4.5		nH	Measured from the drain lead 0.25" from package to center of die
Internal Drain Inductance	$L_S$		7.5		nH	Measured from the source lead 0.25" from package to source bond pad
Total Power Disipation	$P_D$			74	W	
Thermal Resistance – Junction to Case	$\theta_{JC}$			1.7	/W	
Operating and Storage Temperature	$T_J, T_{STG}$	-55		150		
<b>SOURCE-DRAIN DIODE CHARACTERISTICS</b>						
Forward On-Voltage(1)	$V_{SD}$			1.6	V	$I_S = 3.6\text{ A}, V_{GS} = 0\text{ V}, dI_S/dt = 100\text{ A}/\mu\text{s}$
Forward Turn-On Time	$t_{on}$		**		ns	
Reverse Recovery Time	$t_{rr}$		370		ns	

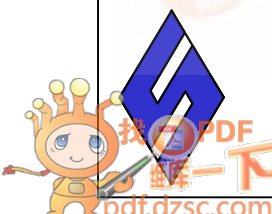
\* Pulse Test: Pulse Width 300 $\mu\text{s}$ , Duty Cycle 2%

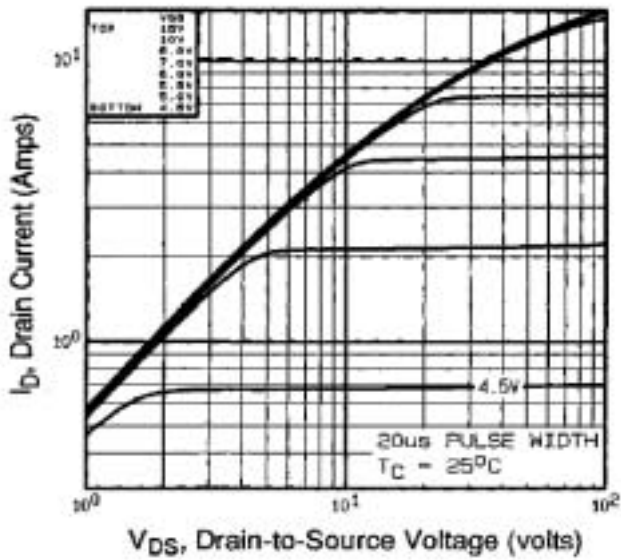
\*\* Negligible, Dominated by circuit inductance

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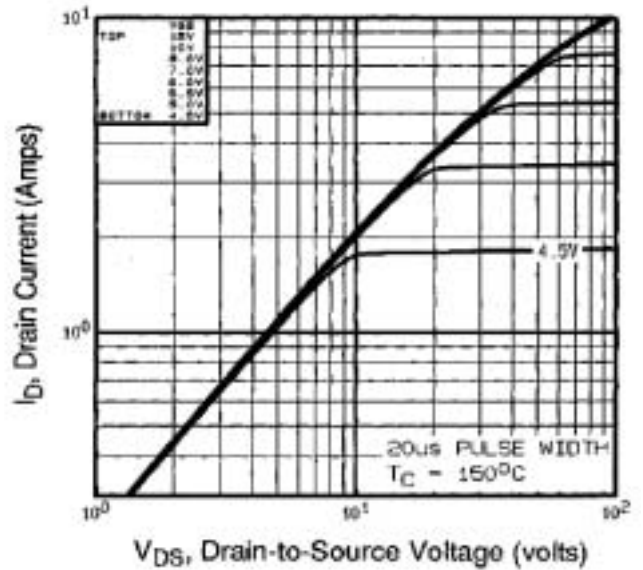
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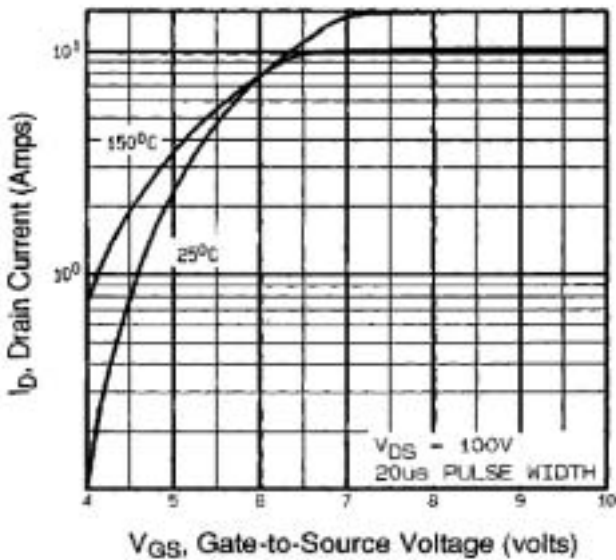




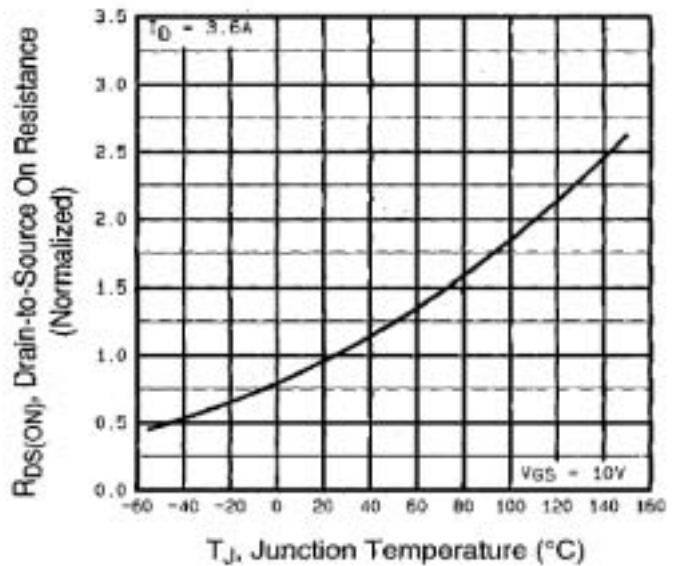
**Fig 1. Typical Output Characteristics,  $T_C=25^\circ\text{C}$**



**Fig 2. Typical Output Characteristics,  $T_C=150^\circ\text{C}$**



**Fig 3. Typical Transfer Characteristics**



**Fig 4. Normalized On-Resistance Vs. Temperature**



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