FMD7N60P5 N-CHANNEL POWER MOSFET

Features :

- Fast body diode eliminates the need for external diode in ZVS applications.
- Lower gate charge results in simpler drive requirements
- Higher gate voltage threshold offers improved noise immunity
- Low on-resistance
- RoHS compliant

V_{DSS}	600	V
I_D	7	A
Trr	198	ns
$R_{DS(ON)Typ}$	1.1	Ω

TO-220FP

Applications:

- Motor control
- Uninterruptible power supplies
- Zero voltage switching SMPS

Absolute（Tc= 25℃）:

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-to-Source Voltage	600	V
I_D	Continuous Drain Current	7*	A
	Continuous Drain Current TC = 100 °C	4.8*	A
I_{DM}①	Pulsed Drain Current	28*	A
V_{GS}	Gate-to-Source Voltage	±30	V
E_{AS}②	Single Pulse Avalanche Energy	440	mJ
E_{AR}①	Avalanche Energy, Repetitive	50	mJ
I_{AR}①	Avalanche Current	3.3	A
P_D	Power Dissipation	40	W
dv/dt	Peak Diode Recovery dv/dt	5	V/nS
T_J	Junction Temperature	150	℃
T_{stg}	Storage Temperature Range	–55 to 150	℃

*: Drain current limited by maximum junction temperature

Ordering Information

Product number	Package	Marking	Packing	Quantity
FMD7N60P5	TO220FP	FMD7N60P5	Tape & Reel	50

Electronic Characteristics（Tc=25°C）

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Drain-source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250μA	600			V
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta Tj$	I_D=250uA, Referenced to 25°C		0.6		V/°C
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS}=V_{DS}, I_D=250μA	2.0		4.0	V
Drain-source Leakage Current	I_{DSS}	V_{DS} =600V,V_{GS} =0V, Tj=25°C			1	μA
		V_{DS} =480V,V_{GS} =0V, Tj=125°C			100	μA
Forward Transconductance	gfs	V_{DS} =15V, I_D=3.5A ③		7		S
Gate-body Leakage Current	I_{GSS}	V_{DS} =0V,V_{GS} =±30V			±100	nA
Drain-source On Resistance	$R_{DS(ON)}$	V_{GS} =10V, I_D=3.5A ③		1.1	1.5	Ω
Input Capacitance	Ciss	V_{GS} = 0V, V_{DS} = 25V F = 1.0MHZ		1050		pF
Output Capacitance	Coss			84		
Reverse transfer Capacitance	Crss			12		
Turn-on Delay Time	Td(on)	V_{DD}=300V, I_D =7.0A R_G=25Ω ③		17		ns
Rise Time	Tr			20		
Turn -Off Delay Time	Td(off)			39		
Fall Time	Tf			18		
Total Gate Charge	Qg	I_D =7.0A, V_{DS} = 480V V_{GS} = 10V ③		21		nC
Gate-to-Source Charge	Qgs			4.8		nC
Gate-to-Drain Charge	Qgd			6.5		nC
Continuous Diode Forward Current	I_S				7.0	A
Max Pulsed Diode Forward Current	I_{SM}				28	A
Diode Forward Voltage	V_{SD}	Tj=25°C, Is=7.0A,V_{GS} =0V ③			1.4	V
Reverse Recovery Time	trr	Tj=25°C, If=7.0A di/dt=100A/μs ③		198		ns
Reverse Recovery Charge	Qrr			0.5		uC
Thermal Resistance Junction-case	Rth_{JC}			3.13		°C/W
Thermal Resistance Junction-ambient	Rth_{JA}			62.5		°C/W

Notes:

① Repetitive rating: Pulse width limited by maximum junction temperature

② Starting Tj=25°C, V_{DD} =50V, L=18mH, R_G =25Ω, I_{AS}=7.0A

③ Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2%

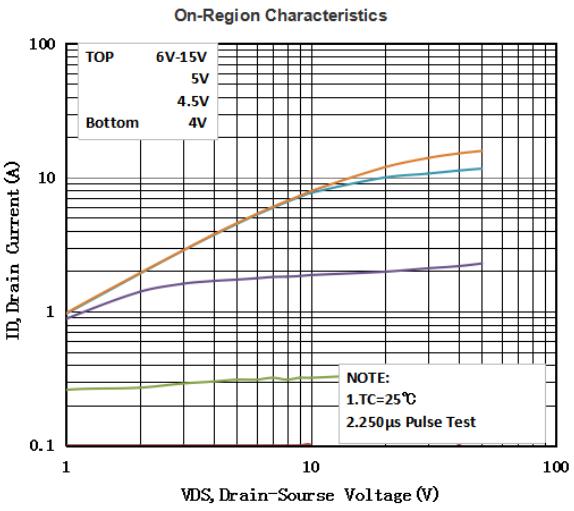


Fig1 Typical Output Characteristics, Tc=25℃

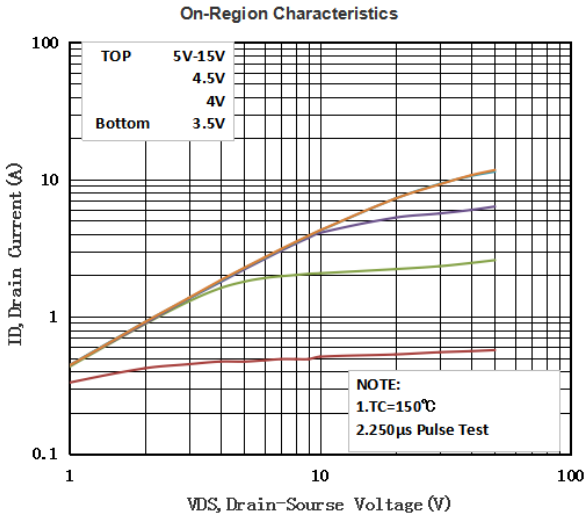


Fig2 Typical Output Characteristics, Tc=150℃

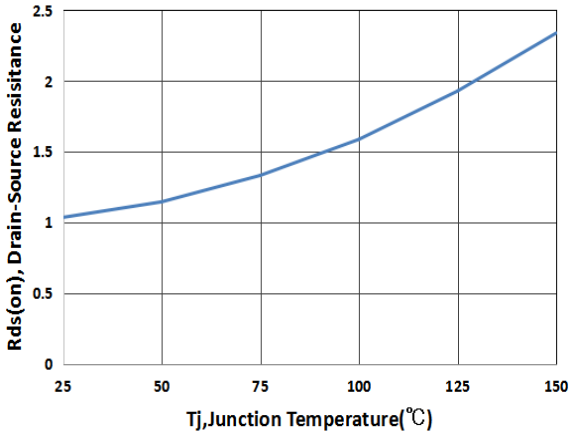


Fig3 On-Resistance Vs.Temperature

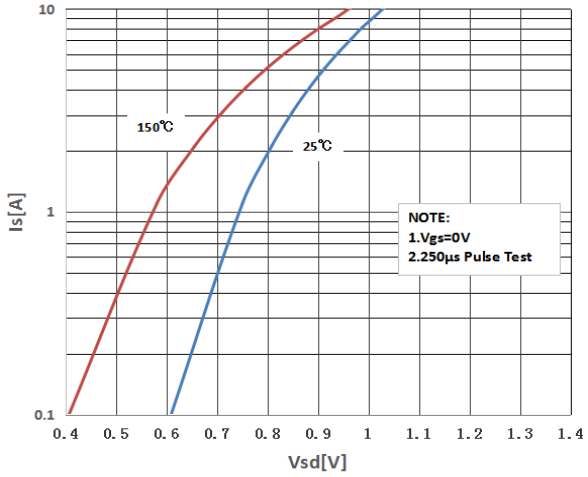


Fig4 Typical Source-Drain Diode Forward Voltage

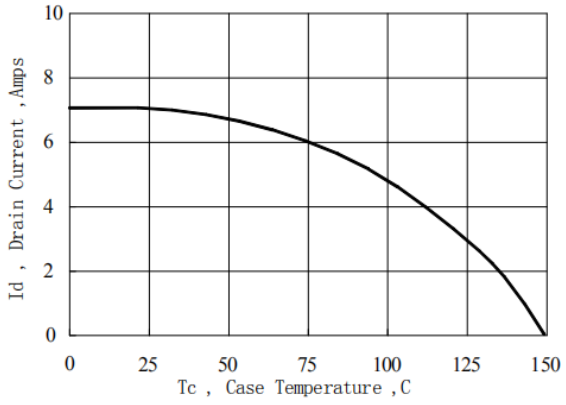


Fig5 Maximum Drain Current Vs.Case Temperature

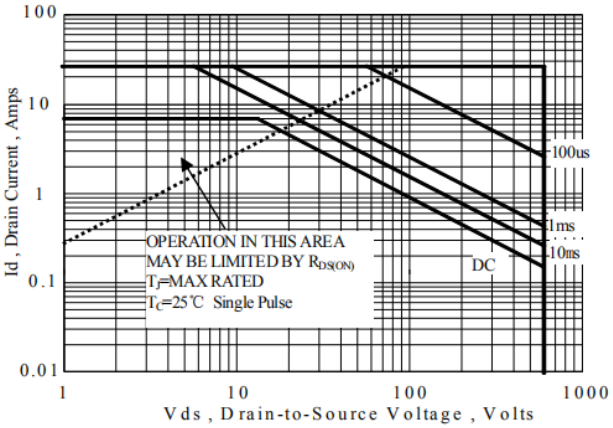


Fig6 Maximum Safe Operating Area

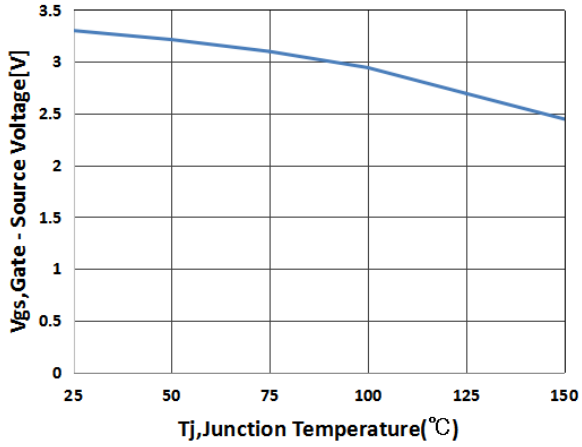


Fig7 Gate Threshold Voltage Variation vs. Temperature

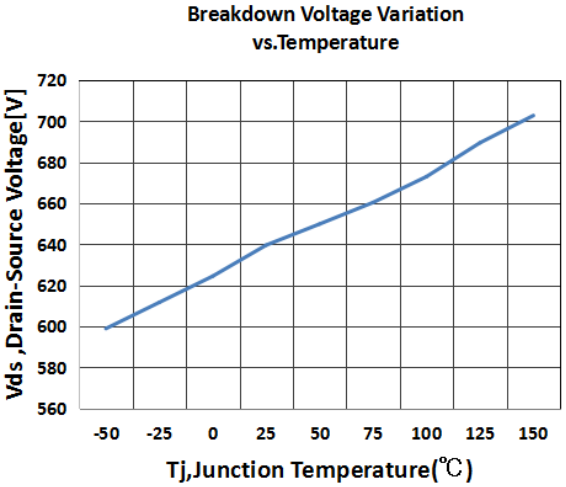


Fig8 Breakdown Voltage Variation vs. Temperature

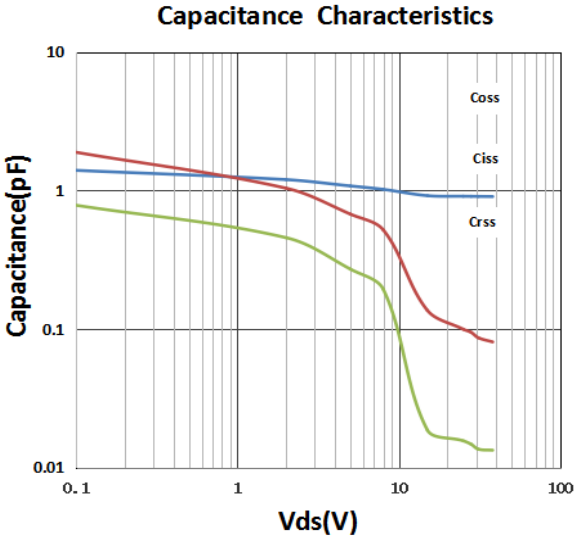


Fig9 Capacitance Characteristics

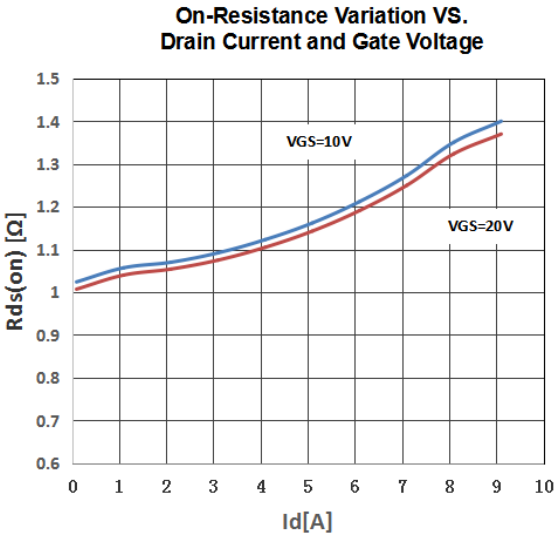


Fig10 On-Resistance Variation VS. Drain Current and Gate Voltage

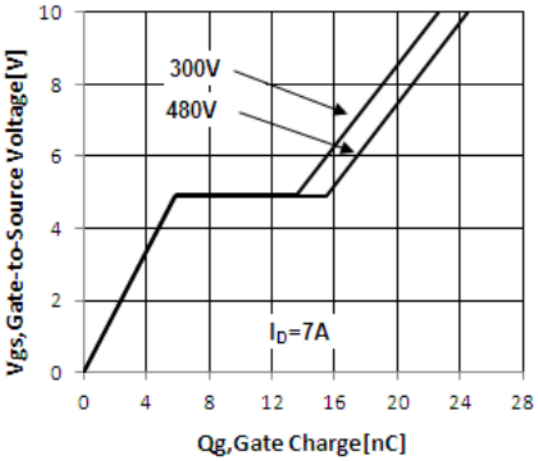


Fig11 Gate Charge VS Gate to Source Voltage

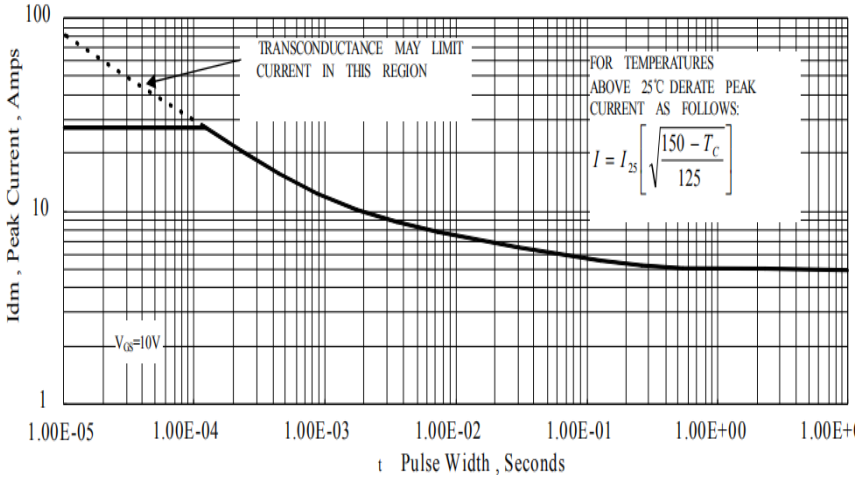


Fig12 I_{DM} VS Pulse Width

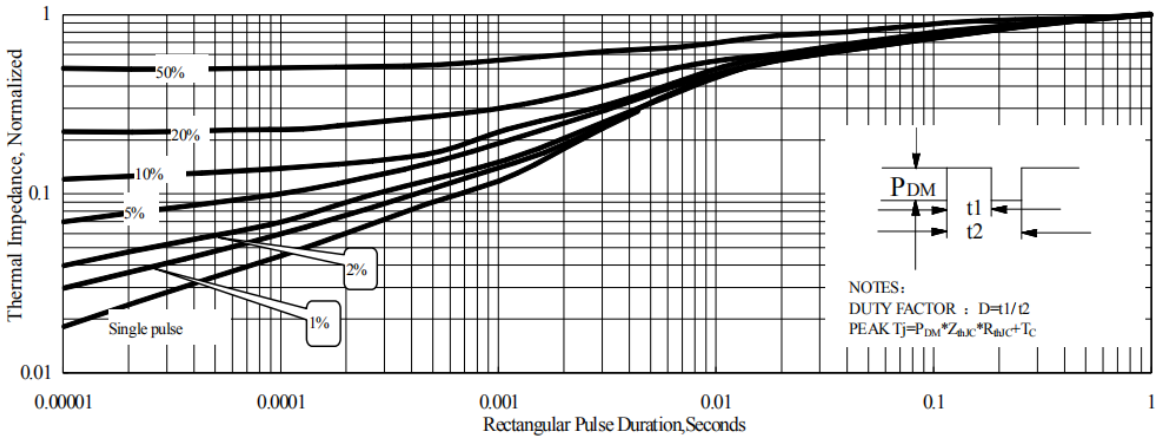
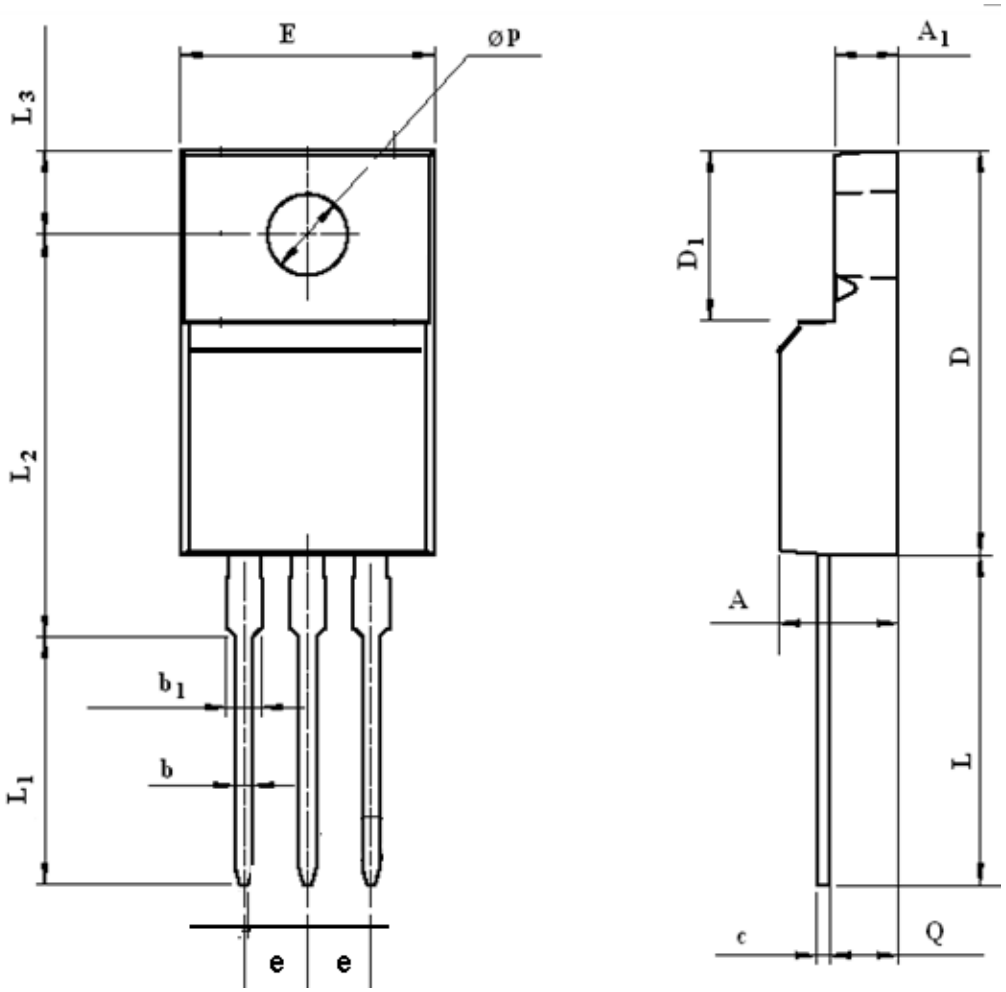


Fig13 Normalized Thermal Impendence VS Rectangular Pulse Duration

TO-220FP MECHANICAL DATA

UNIT：mm

SYMBOL	min	nom	max	SYMBOL	min	nom	max
A	**4.40**		**4.95**	e		2.54	
A_1	2.30		2.90	L	12.50		14.30
b	0.45		0.90	L_1	9.10		10.05
b_1	1.10		1.70	L_2	15.00		16.00
c	0.35		0.90	L_3	3.00		4.00
D	14.50		17.00	øp	3.00		3.50
D1	6.10		9.00	Q	2.30		2.80
E	9.60		10.30				



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