

FMD7N60E5

N-CHANNEL POWER MOSFET

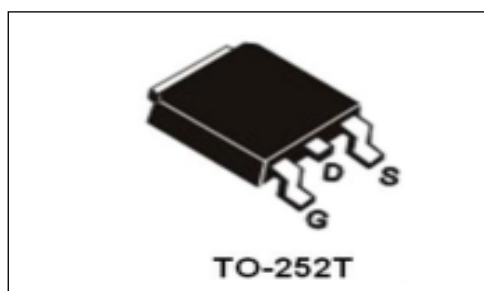
Features:

- 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
T_{rr}	198	ns
$R_{DS(ON)Typ}$	1.1	Ω

Applications:

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



Absolute (T_C= 25°C):

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-to-Source Voltage	600	V
I_D	Continuous Drain Current	7*	A
	Continuous Drain Current T _C = 100 °C	4.8*	A
$I_{DM①}$	Pulsed Drain Current	28*	A
V_{GS}	Gate-to-Source Voltage	±30	V
$E_{AS②}$	Single Pulse Avalanche Energy	440	mJ
$E_{AR①}$	Avalanche Energy, Repetitive	50	mJ
$I_{AR①}$	Avalanche Current	3.3	A
P_D	Power Dissipation	96	W
dv/dt	Peak Diode Recovery dv/dt	5	V/nS
T _J	Junction Temperature	150	°C
T _{stg}	Storage Temperature Range	-55 to 150	°C

*: Drain current is limited by maximum junction temperature

Ordering Information

Product number	Package	Marking	Packing	Quantity
FMD7N60E5	TO252T	FMD7N60E5	Tape & Reel	2500

Electronic Characteristics (Tc=25°C)

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Drain-source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250mA$	600			V
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_j$	$I_D=250\mu A$, Referenced to 25°C		0.6		V/°C
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS}=V_{DS}, I_D=250mA$	2		4	V
Drain-source Leakage Current	I_{DSS}	$V_{DS}=600V, V_{GS}=0V, T_j=25^\circ C$			1	mA
		$V_{DS}=480V, V_{GS}=0V, T_j=125^\circ C$			100	mA
Forward Transconductance	g_{fs}	$V_{DS}=15V, I_D=3.5A$ ③		7		S
Gate-body Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 30V$			±100	nA
Drain-source On Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=3.5A$ ③		1.1	1.5	Ω
Input Capacitance	C_{iss}	$V_{GS}=0V, V_{DS}=25V$ $F=1.0MHz$		1050		pF
Output Capacitance	C_{oss}			84		
Reverse transfer Capacitance	C_{rss}			12		
Turn-on Delay Time	$T_d(on)$	$V_{DD}=300V, I_D=7.0A$ $R_G=25\Omega$ ③		17		ns
Rise Time	T_r			20		
Turn -Off Delay Time	$T_d(off)$			39		
Fall Time	T_f			18		
Total Gate Charge	Q_g	$I_D=7.0A, V_{DS}=480V$ $V_{GS}=10V$ ③		21		nC
Gate-to-Source Charge	Q_{gs}			4.8		nC
Gate-to-Drain Charge	Q_{gd}			6.5		nC
Continuous Diode Forward Current	I_S				7	A
Max Pulsed Diode Forward Current	I_{SM}				28	A
Diode Forward Voltage	V_{SD}	$T_j=25^\circ C, I_S=7.0A, V_{GS}=0V$ ③			1.4	V
Reverse Recovery Time	t_{rr}	$T_j=25^\circ C, I_f=7.0A$ $di/dt=100A/\mu s$ ③		198		ns
Reverse Recovery Charge	Q_{rr}			0.5		uC
Thermal Resistance Junction-case	R_{thJC}			1.3		°C/W
Thermal Resistance Junction-ambient	R_{thJA}			62.5		°C/W

Notes:

- ① Repetitive rating: Pulse width is limited by the maximum junction temperature
- ② Starting $T_j=25^\circ C, V_{DD}=50V, L=18mH, R_G=25\Omega, I_{AS}=7.0A$
- ③ Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2%

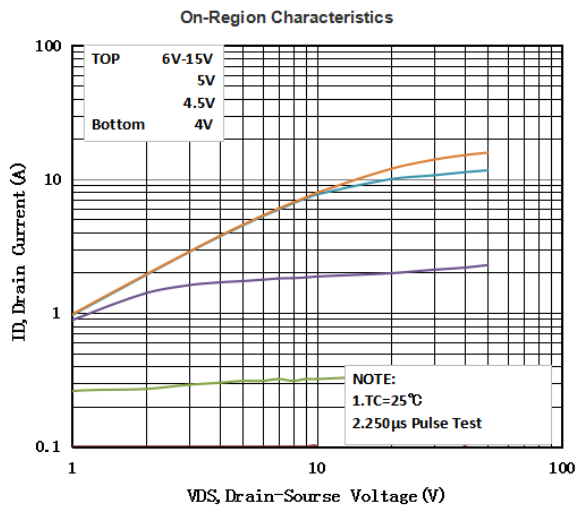


Fig.1 Typical Output Characteristics, $T_C=25^\circ\text{C}$

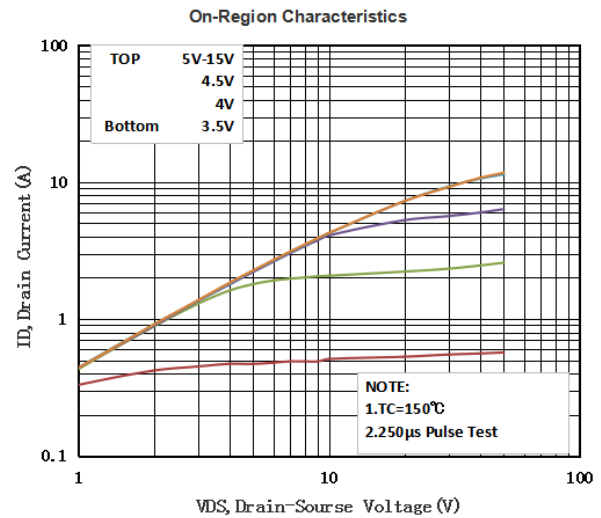


Fig.2 Typical Output Characteristics, $T_C=150^\circ\text{C}$

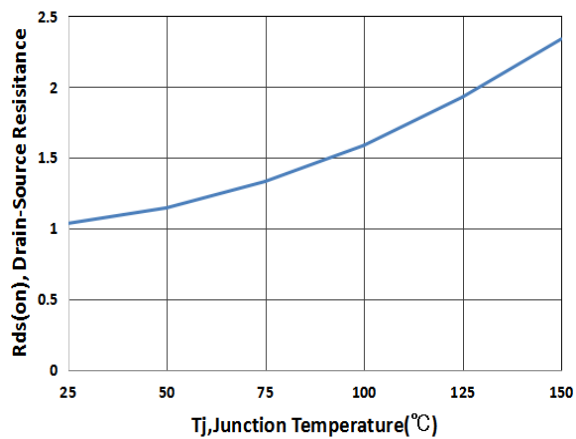


Fig.3 On-Resistance Vs. Temperature

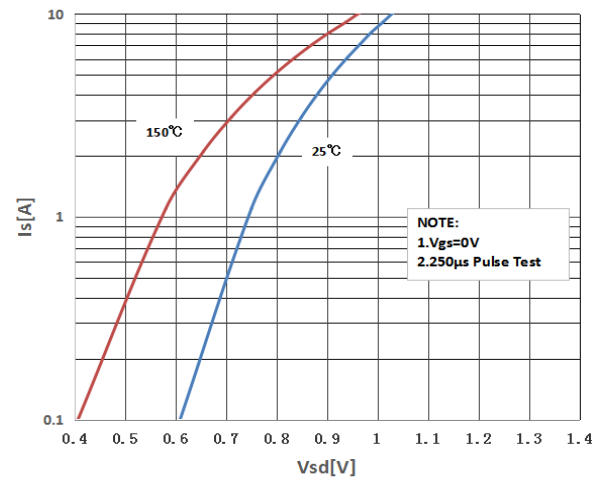


Fig.4 Typical Source-Drain Diode Forward Voltage

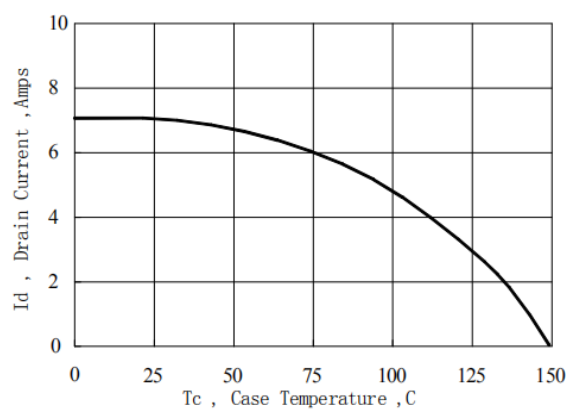


Fig.5 Maximum Drain Current Vs. Case Temperature

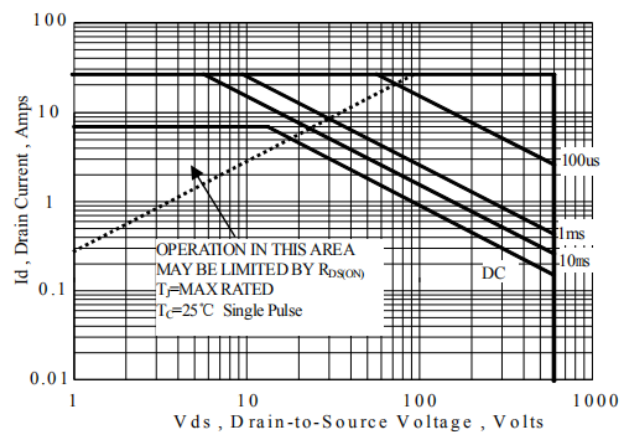


Fig.6 Maximum Safe Operating Area

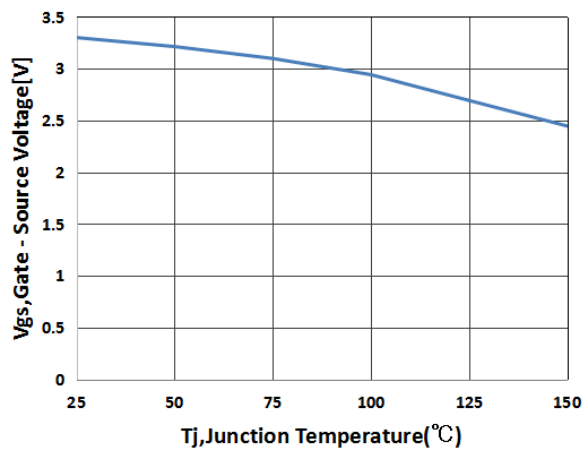


Fig.7 Gate Threshold Voltage Variation vs. Temperature

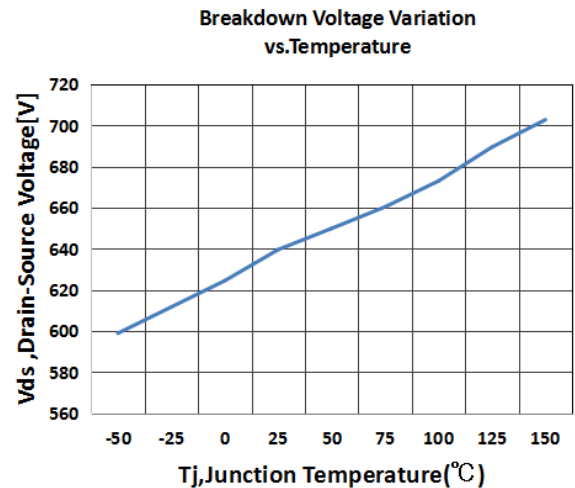


Fig.8 Breakdown Voltage Variation vs. Temperature

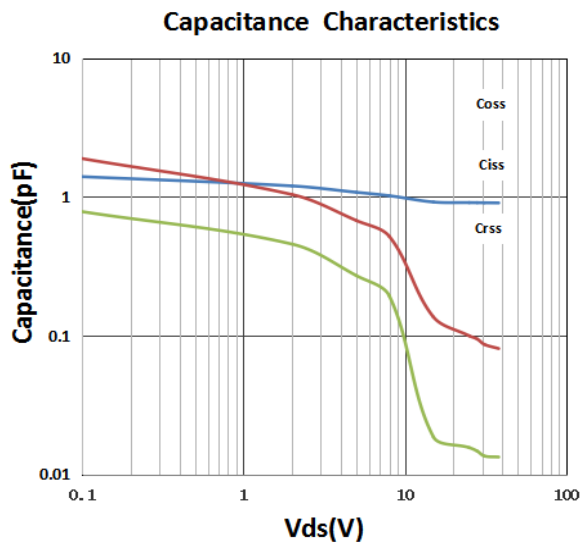


Fig.9 Capacitance Characteristics

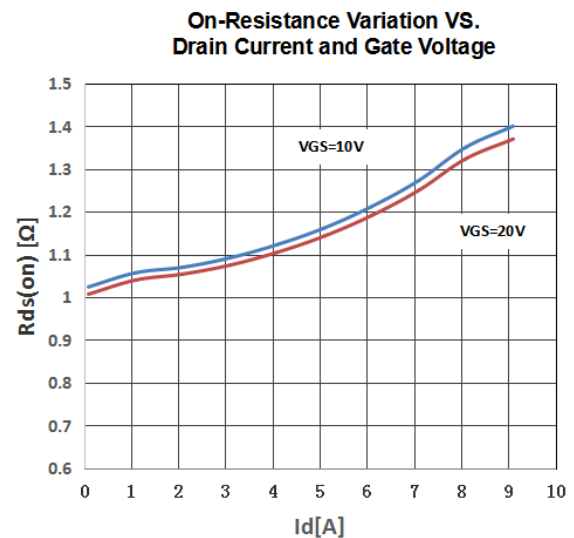


Fig.10 On-Resistance Variation VS. Drain Current and Gate Voltage

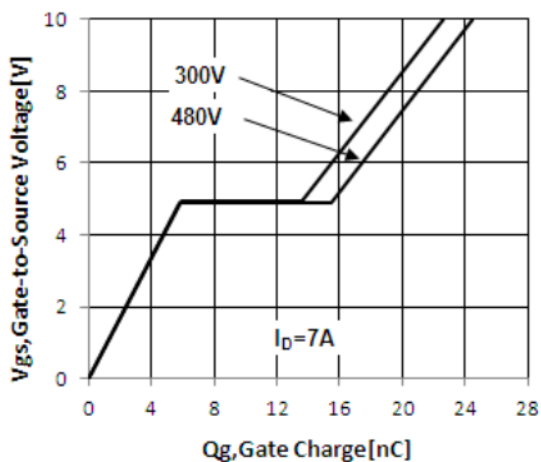


Fig.11 Gate Charge VS Gate to Source Voltage

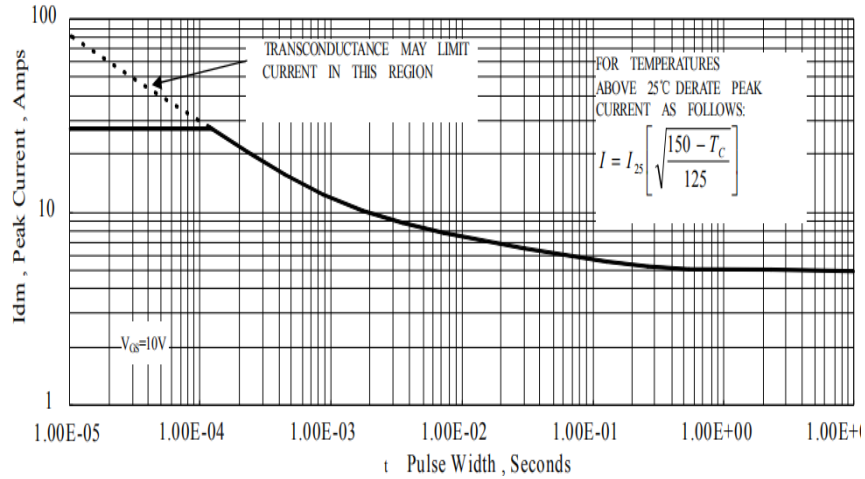


Fig.12 I_{DM} VS Pulse Width

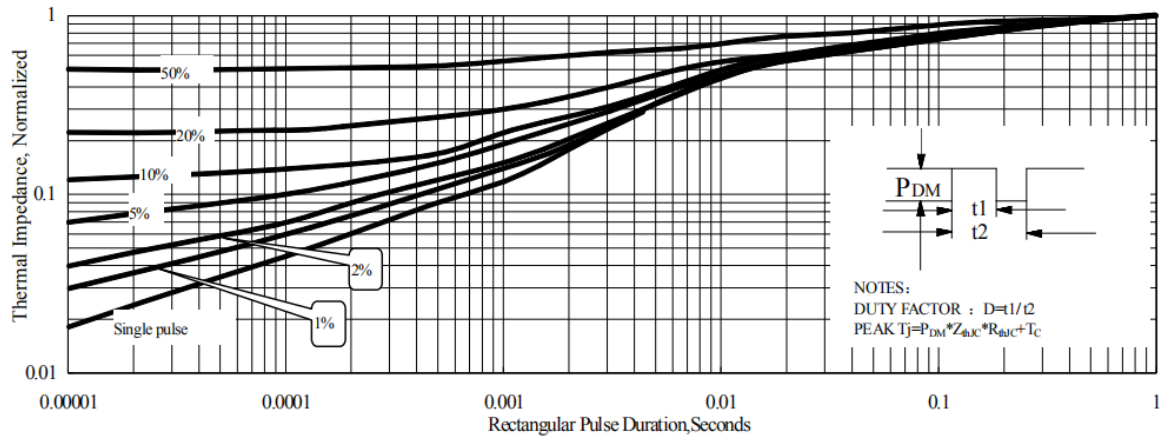
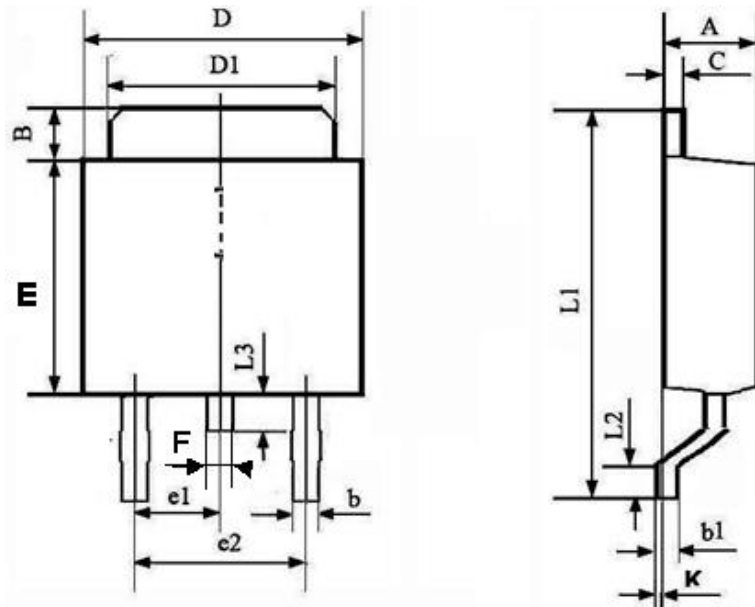


Fig.13 Normalized Thermal Impedence VS Rectangular Pulse Duration

TO-252T MECHANICAL DATA

UNIT: mm

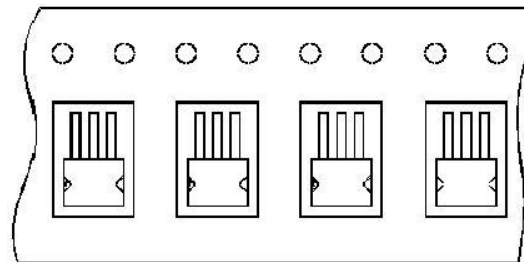
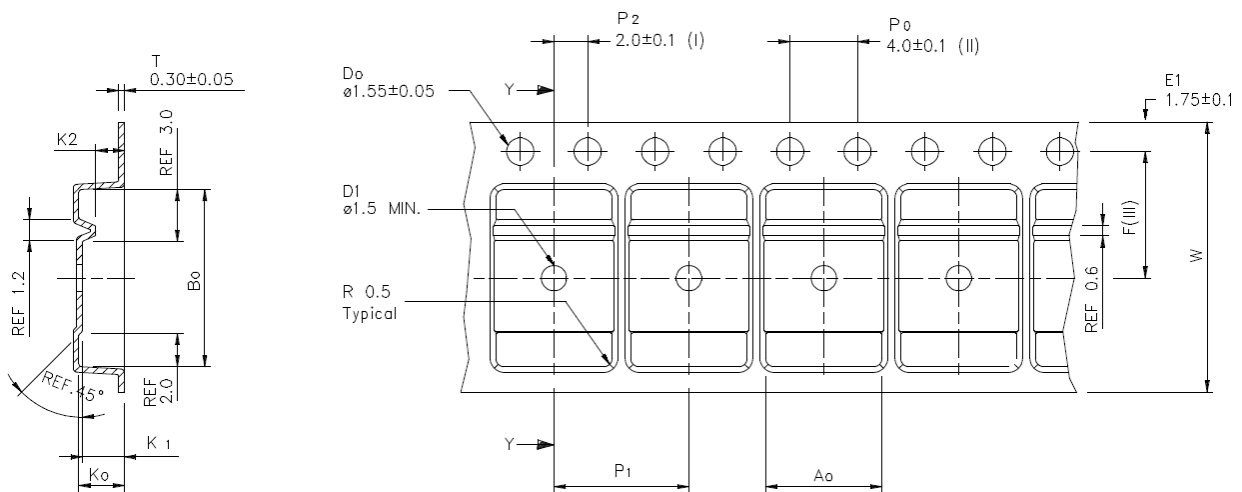
SYMBOL	min	max	SYMBOL	min	max
A	2.20	2.40	B	0.85	1.25
b	0.50	0.80	C	0.45	0.70
b1	0.45	0.70	D	6.30	6.70
D1	5.10	5.50	E	5.30	6.20
L1	9.20	10.60	F	0.50	0.90
L2	0.90	1.50	e1	2.25	2.35
L3	0.60	1.10	e2	4.50	4.70
			K	0.00	0.18



TO-252T TAPE AND REEL DATA

UNIT: mm

SYMBOL	min	nom	max	SYMBOL	min	nom	max
A0	6.80	6.90	7.00	B0	10.40	10.50	10.60
K0	2.60	2.70	2.90	K1	2.40	2.50	2.60
F	7.40	7.50	7.60	K2	1.60	1.70	1.80
W	15.90	16.00	16.10	P1	7.90	8.00	8.10



UNIT ORIENTATION

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