

FMD5N60E5

N-CHANNEL POWER MOSFET

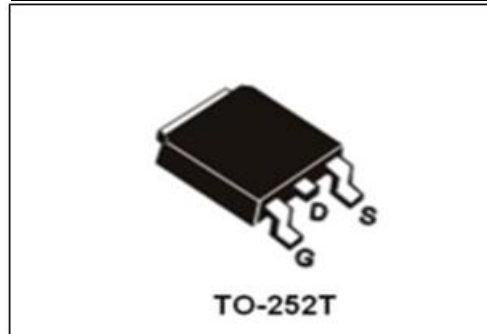
Features :

- 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

Applications:

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

V_{DSS}	600	V
I_D	5	A
T_{rr}	140	ns
$R_{DS(ON)Typ}$	1.5	Ω



Absolute ($T_c = 25^\circ C$):

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-to-Source Voltage	600	V
I_D	Continuous Drain Current	5*	A
	Continuous Drain Current $T_C = 100^\circ C$	3.4*	A
I_{DM} ①	Pulsed Drain Current	20*	A
V_{GS}	Gate-to-Source Voltage	± 30	V
E_{AS} ②	Single Pulse Avalanche Energy	275	mJ
E_{AR} ①	Avalanche Energy, Repetitive	30	mJ
I_{AR} ①	Avalanche Current	3.1	A
P_D	Power Dissipation	85	W
dv/dt	Peak Diode Recovery dv/dt	5	V/nS
T_J	Junction Temperature	150	$^\circ C$
T_{stg}	Storage Temperature Range	-55 to 150	$^\circ C$

*: Drain current limited by maximum junction temperature

Ordering Information

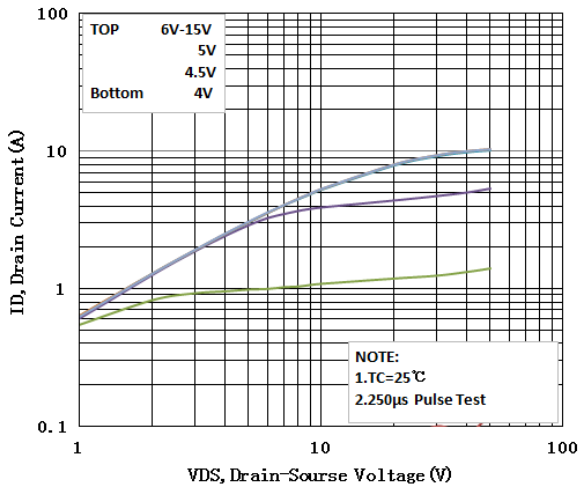
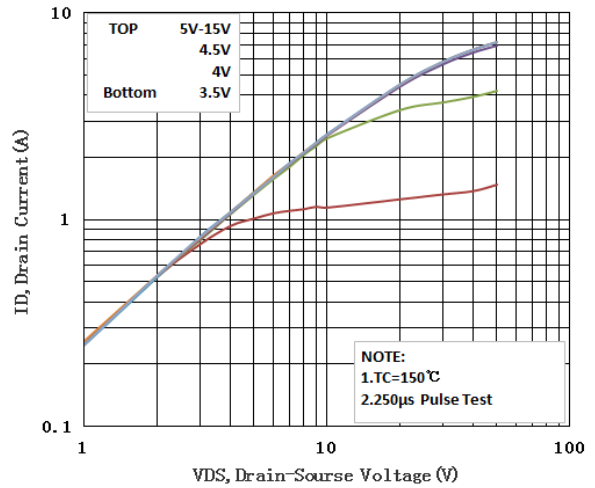
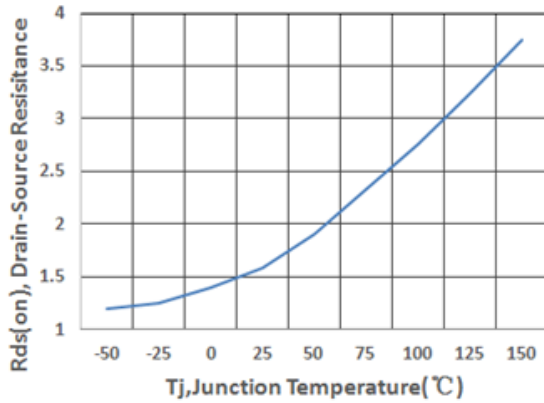
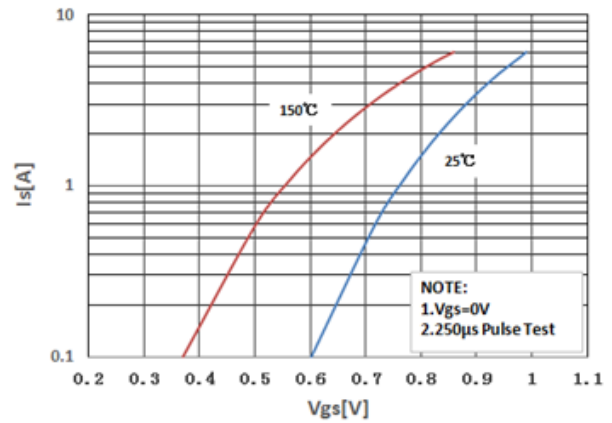
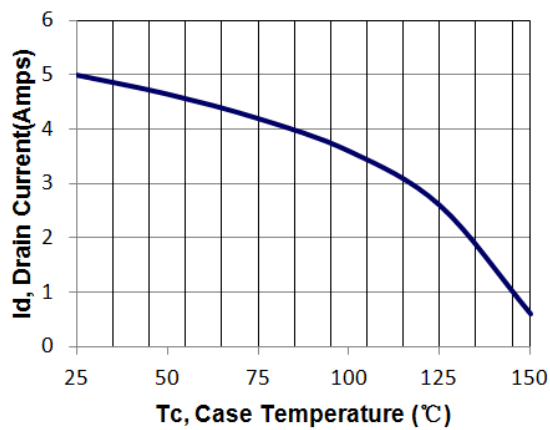
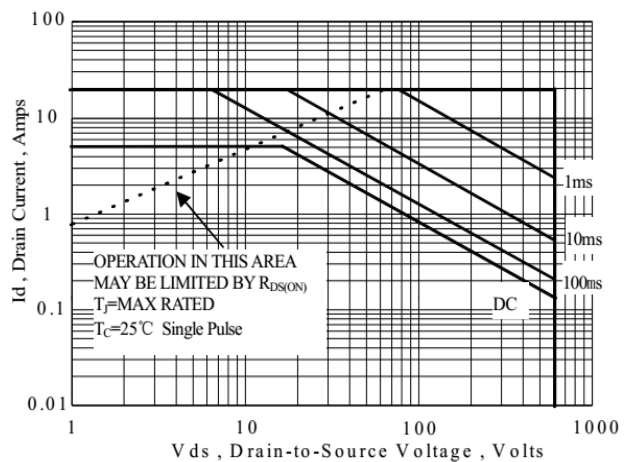
Product number	Package	Marking	Packing	Quantity
FMD5N60E5	TO252T	FMD5N60E5	Tape & Reel	2500

Electronic Characteristics (Tc=25°C)

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Drain-source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	600			V
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	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, T _J =25°C			1	μA
		V _{DS} =480V, V _{GS} =0V, T _J =125°C			100	μA
Forward Transconductance	g _{fs}	V _{DS} =15V, I _D =2.5A ③		5		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 =2.5A ③		1.5	2.25	Ω
Input Capacitance	C _{iss}	V _{GS} = 0V, V _{DS} = 25V F = 1.0MHZ		700		pF
Output Capacitance	C _{oss}			63		
Reverse transfer Capacitance	C _{rss}			9		
Turn-on Delay Time	T _{d(on)}	V _{DD} =300V, I _D =5.0A R _G =25Ω ③		9		ns
Rise Time	T _r			10		
Turn -Off Delay Time	T _{d(off)}			35		
Fall Time	T _f			15.5		
Total Gate Charge	Q _g	I _D =5.0A, V _{DS} = 480V V _{GS} = 10V ③		15		nC
Gate-to-Source Charge	Q _{gs}			3.1		nC
Gate-to-Drain Charge	Q _{gd}			4.6		nC
Continuous Diode Forward Current	I _S				5.0	A
Max Pulsed Diode Forward Current	I _{SM}				20	A
Diode Forward Voltage	V _{SD}	T _J =25°C, I _S =5.0A, V _{GS} =0V ③			1.4	V
Reverse Recovery Time	t _{rr}	T _J =25°C, I _f =5.0A di/dt=100A/μs ③		140		ns
Reverse Recovery Charge	Q _{rr}			0.35		uC
Thermal Resistance Junction-case	R _{thJC}			1.47		°C/W
Thermal Resistance Junction-ambient	R _{thJA}			62.5		°C/W

Notes:

- ① Repetitive rating: Pulse width limited by maximum junction temperature
- ② Starting T_J=25°C, V_{DD} =50V, L=22mH, R_G =25Ω, I_{AS}=5.0A
- ③ Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2%


Fig1 Typical Output Characteristics, Tc=25°C

Fig2 Typical Output Characteristics, Tc=150°C

Fig3 On-Resistance Vs. Temperature

Fig4 Typical Source-Drain Diode Forward Voltage

Fig5 Maximum Drain Current Vs. Case Temperature

Fig6 Maximum Safe Operating Area

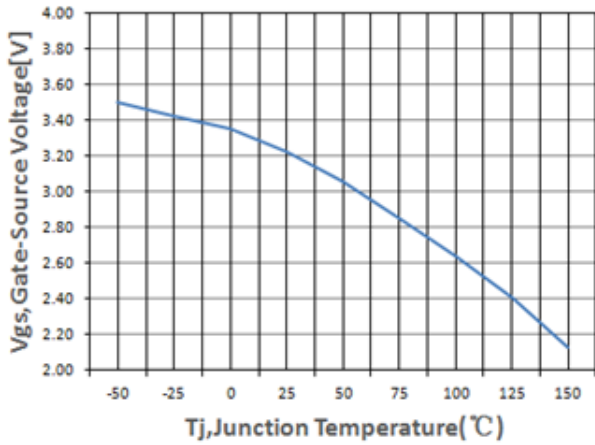


Fig7 Gate Threshold Voltage Variation vs. Temperature Variation

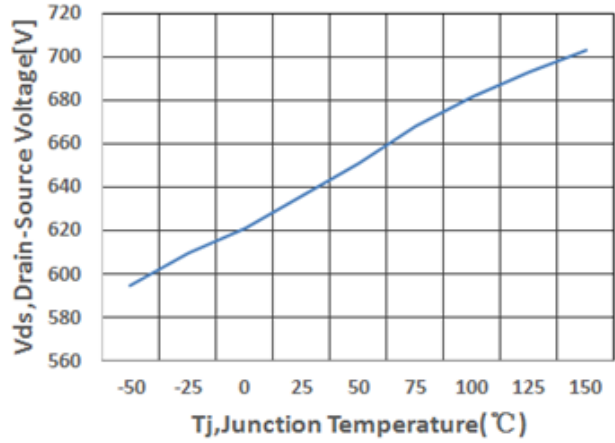


Fig8 Breakdown Voltage vs.

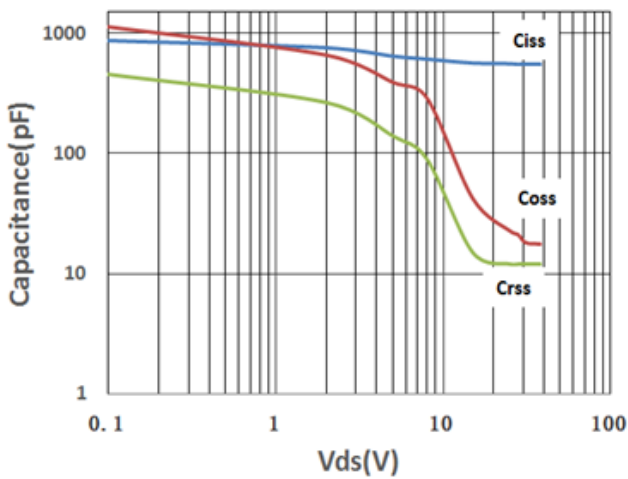


Fig9 Capacitance Characteristics

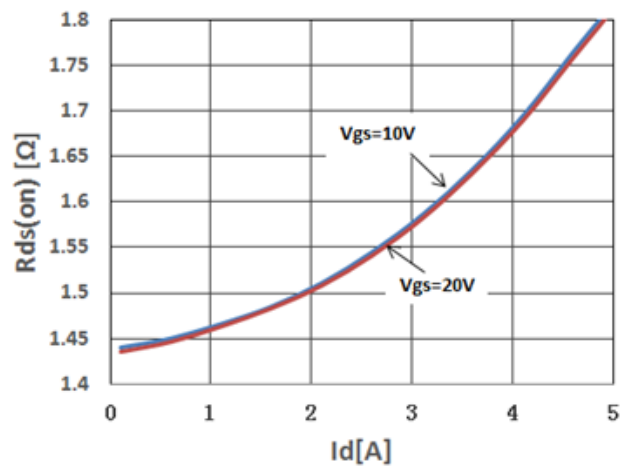


Fig10 On-Resistance Variation VS. Drain Current and Gate Voltage

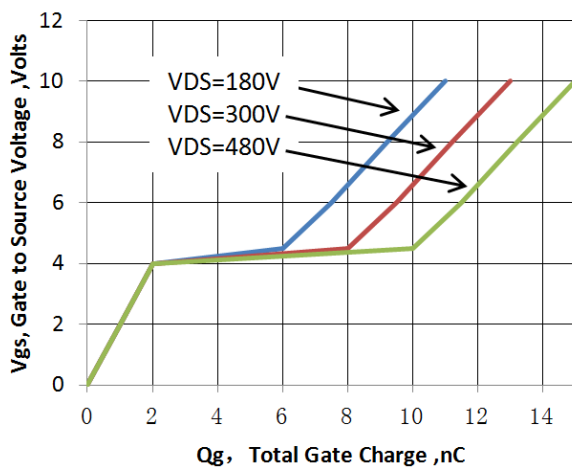
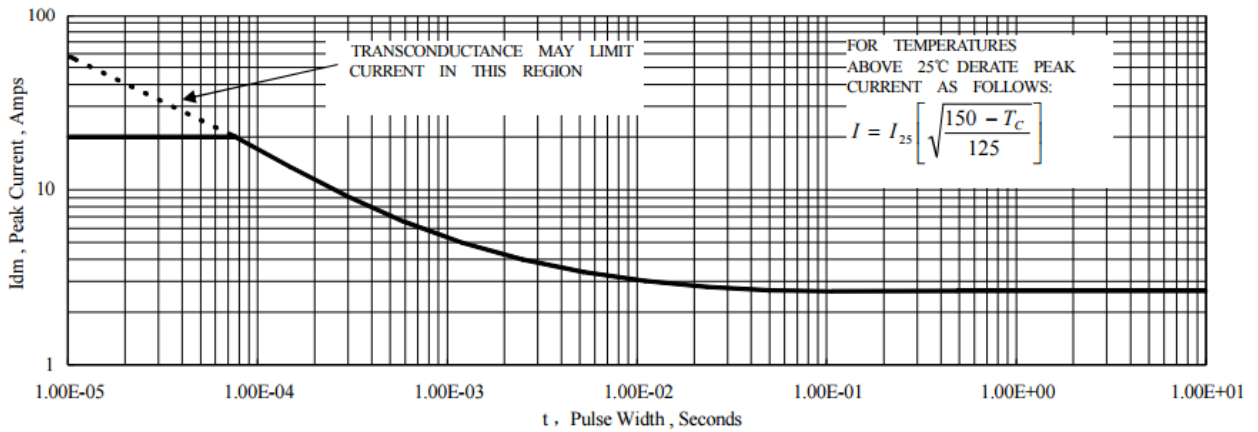
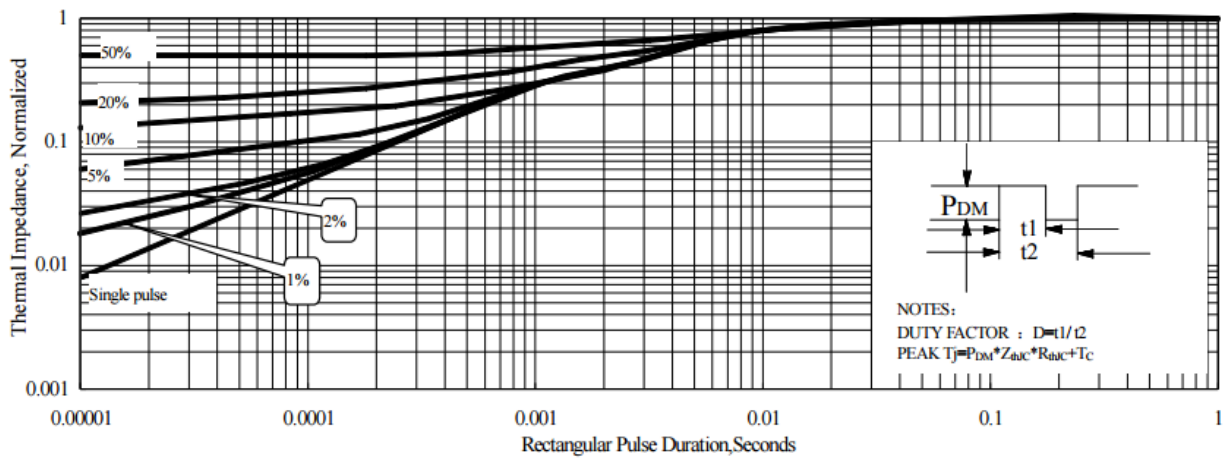
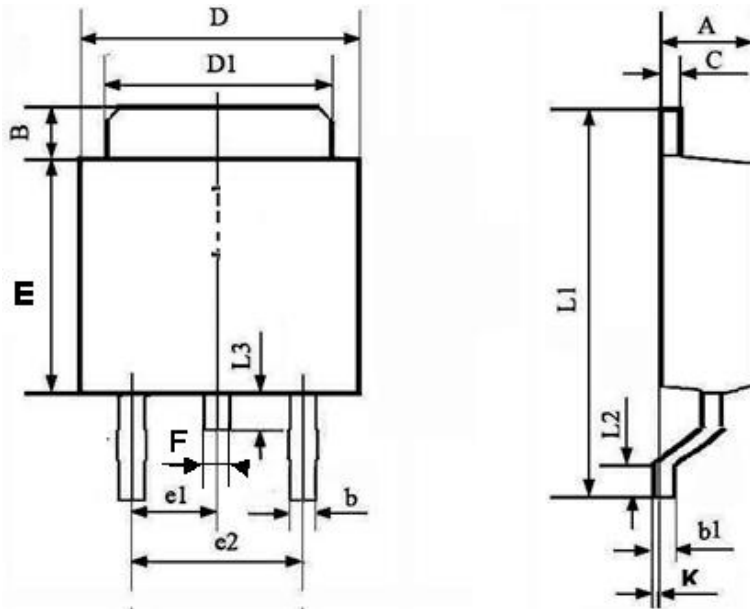


Fig11 Gate Charge VS Gate to Source Voltage


Fig12 I_{DM} VS Pulse Width

Fig13 Normalized Thermal Impedence VS Rectangular Pulse Duration

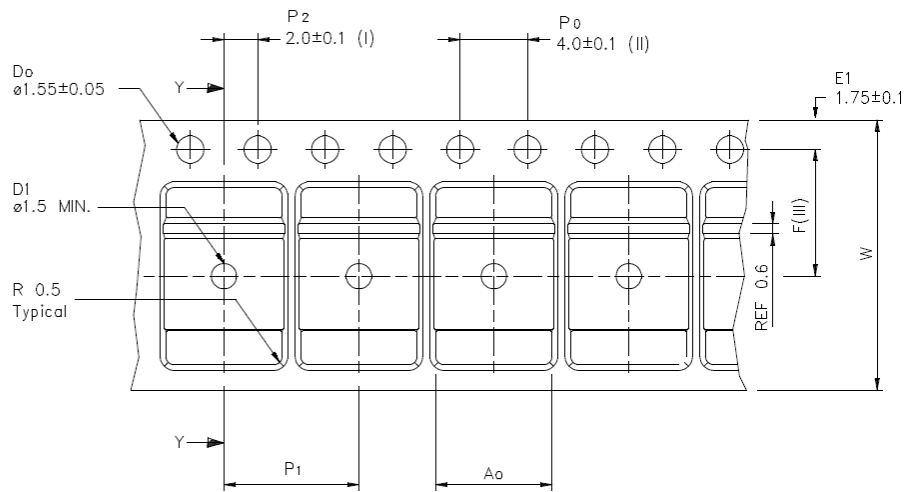
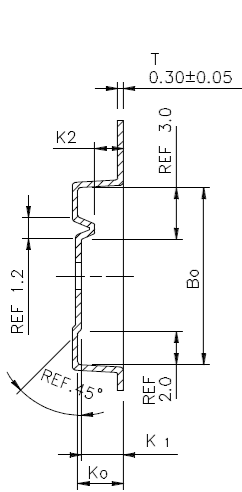
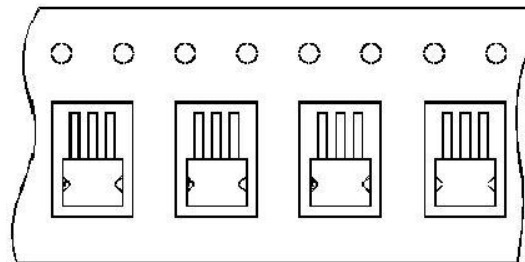
TO-252T MECHANICAL DATA
UNIT: mm

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


USER DIRECTION OF FEED

UNIT ORIENTATION

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