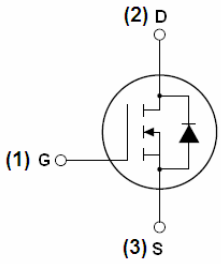
EFM025N03D

N-Channel Advanced MOSFET

• Product Summary

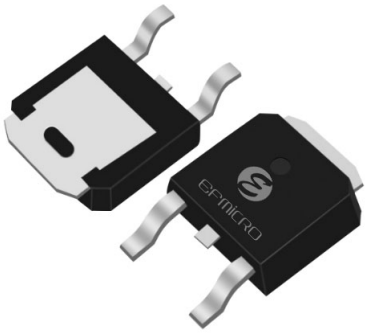
Part #	V_{DS}	$R_{DS(on).typ}$ ($@V_{GS}$=10V)	$R_{DS(on).typ}$ ($@V_{GS}$=4.5V)	I_D
EFM025N03D	30V	2.5mΩ	3.6mΩ	120A



N-Channel MOSFET

• Description

- The EFM025N03D is the high cell density trenched
- N-ch MOSFETs which provide excellent
- RDSON and gate cherge for most of the
- synchronous buck converter applications.
- The EFM025N03D meet the RoHS and Green
- Prod uct requirement, 100 % EAS guaranteed
- with full function reliability approved.



TO-252-2L

•Application

- Super Low Gate Charge 100% EAS Guaranteed
- Green Device Available Excellent CdV/dt effect decline
- Advanced high cell density Trench technology

•Ordering Information:

Part NO.	EFM025N03D
Marking	025N03D****
Packing Information	REEL TAPE
Basic ordering unit (pcs)	2500

•Absolute Maximum Ratings (T_C=25℃)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous	I_D	120	A
Drain Current-Pulsed (Note 1)	I_{DM}	480	A
Maximum Power Dissipation	P_D	88	W
Single pulse avalanche energy (Note 5)	E_{AS}	333	mJ
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 To 150	℃

•Thermal Characteristic

Thermal Resistance,Junction-to-Ambient (Note 2)	$R_{\theta JC}$	1.4	℃/W

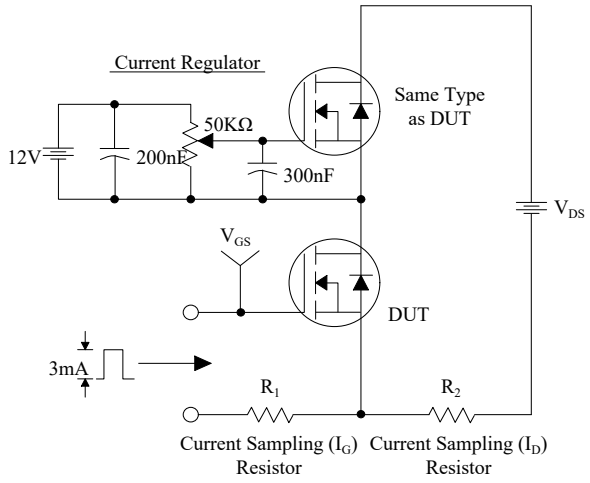
● Static Electrical Characteristics @ T_J = 25°C (unless otherwise stated)

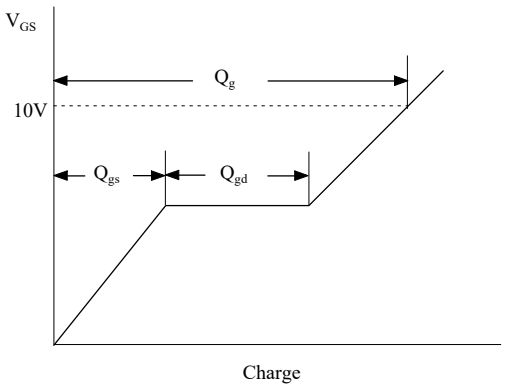
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=250uA	30	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=30V V_{GS}=0V	--	--	1	uA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V V_{DS}=0V	--	--	±100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS} I_D=250uA	1.0	1.5	2.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V I_D=20A	--	2.5	3.1	mΩ
		V_{GS}=4.5V I_D=15A	--	3.6	4.5	mΩ
Dynamic Characteristics (Note4)						
Input Capacitance	C_{lss}	V_{DS}=15V V_{GS}=0V F=1.0MHz	--	4000	--	PF
Output Capacitance	C_{oss}		--	437	--	PF
Reverse Transfer Capacitance	C_{rss}		--	396	--	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=15V I_D=30A V_{GS}=10V R_L=3Ω,	--	14	--	nS
Turn-on Rise Time	t_r		--	18	--	nS
Turn-Off Delay Time	$t_{d(off)}$		--	40	--	nS
Turn-Off Fall Time	t_f		--	12	--	nS
Total Gate Charge	Q_g	V_{DS}=15V I_D=30A V_{GS}=10V	--	72	--	nC
Gate-Source Charge	Q_{gs}		--	46	--	nC
Gate-Drain Charge	Q_{gd}		--	13	--	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V_{SD}	V_{GS}=0V I_S=1A	--	--	1.2	V
Diode Forward Current (Note 2)	I_S		--	--	100	A

Note :
1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition: T_J=25℃, V_{DD}=15V, V_G=10V, R_G=25Ω, L=0.5mH, I_{AS}=25A
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

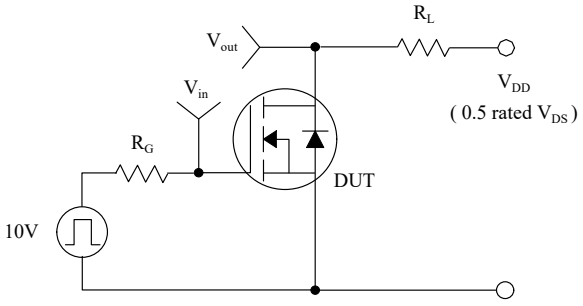
• Test Circuit

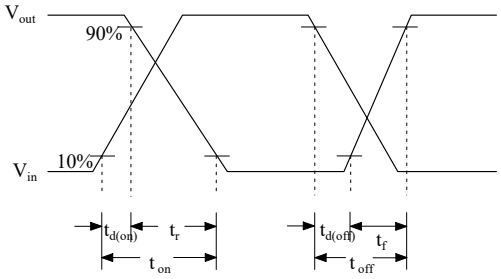
Gate Charge Test Circuit & Waveform



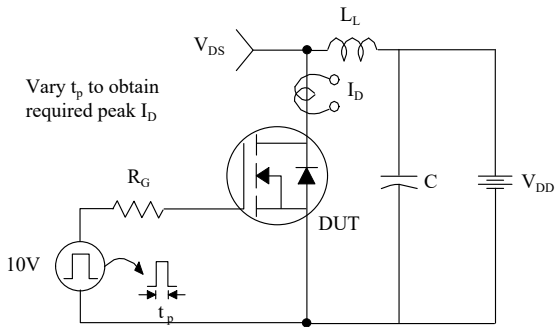


Resistive Switching Test Circuit & Waveforms

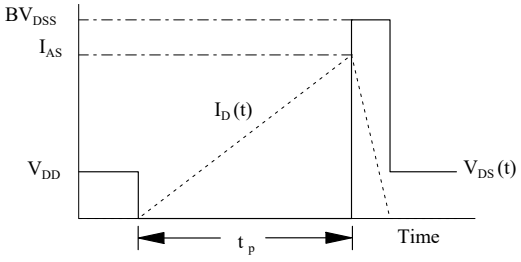




Unclamped Inductive Switching Test Circuit & Waveforms



$$E_{AS} = \frac{1}{2} L_L I_{AS}^2$$



• Typical Characteristics

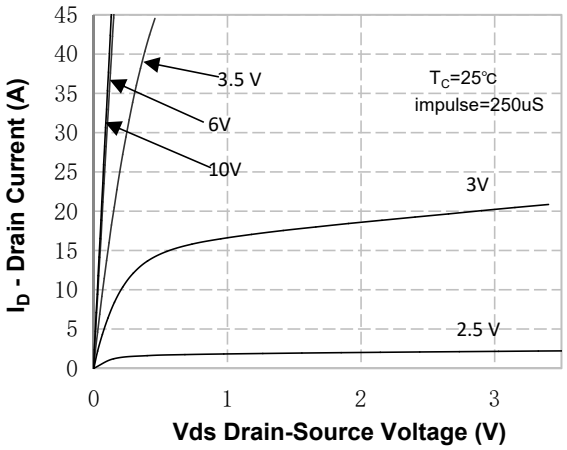


Figure 1. On-Region Characteristics

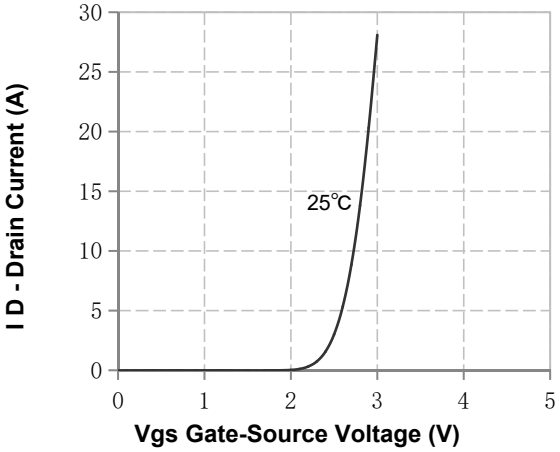


Figure 2. Transfer Characteristics

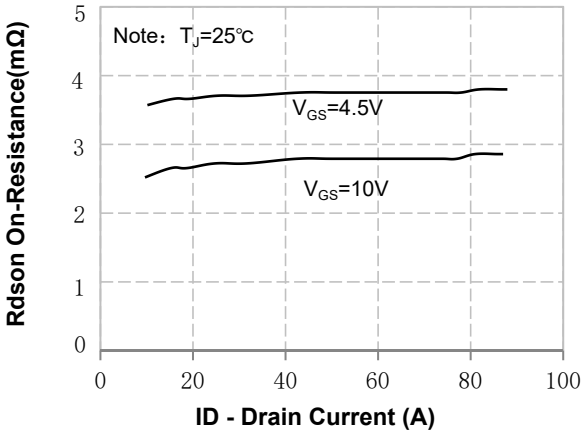


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

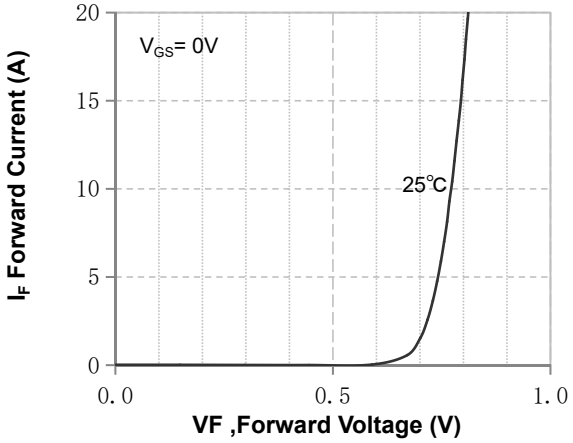


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

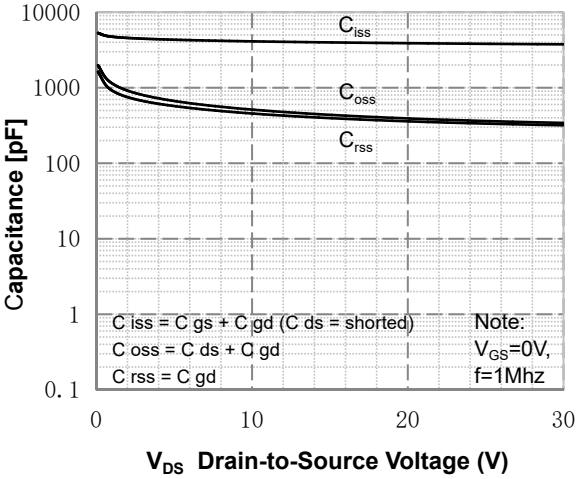


Figure 5. Capacitance Characteristics

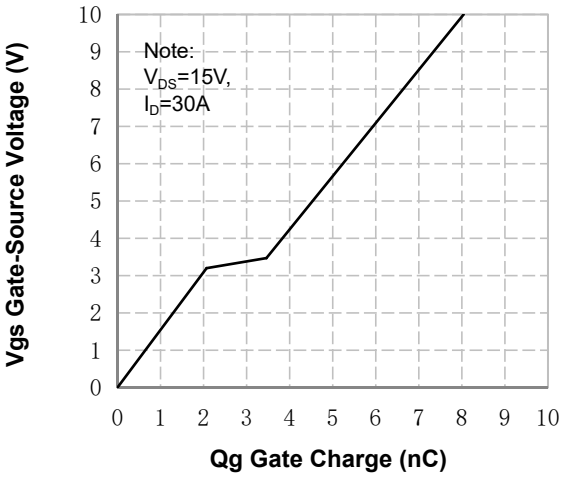


Figure 6. Gate Charge Characteristics

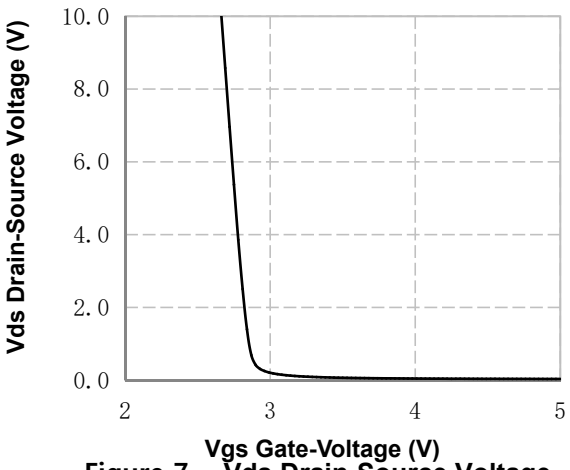


Figure 7. Vds Drain-Source Voltage vs Gate Voltage

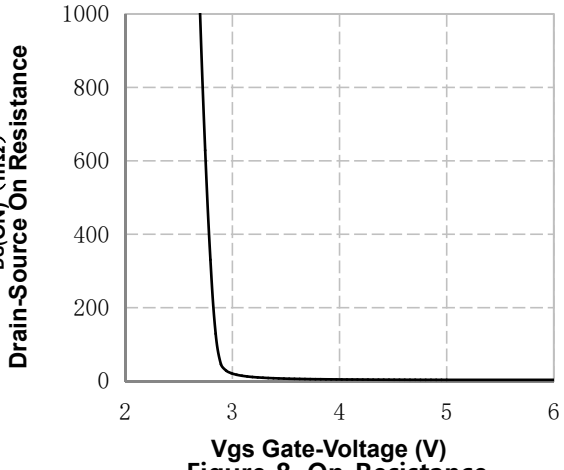


Figure 8. On-Resistance vs Gate Voltage

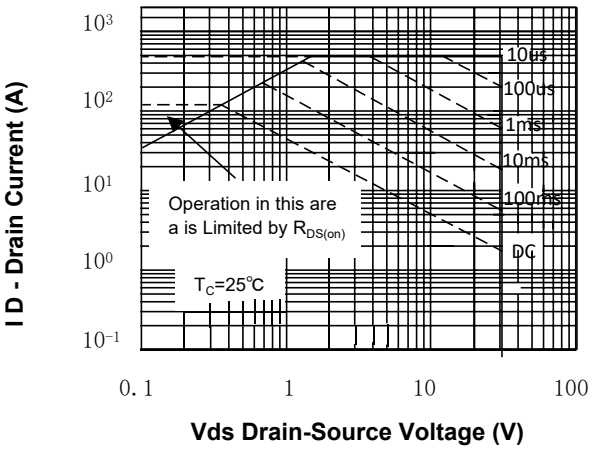


Figure 9. Maximum Safe Operating Area

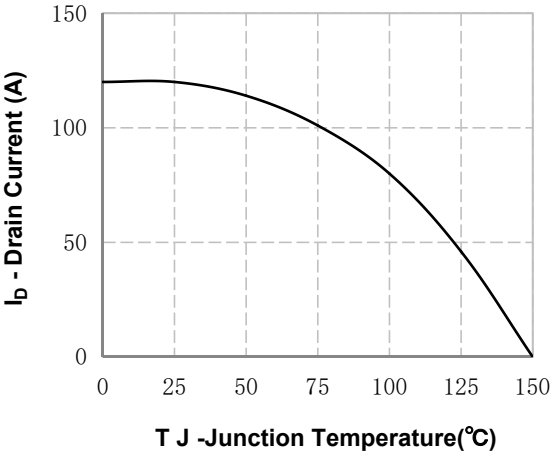


Figure 10. Maximum Continuous Drain Current vs Temperature

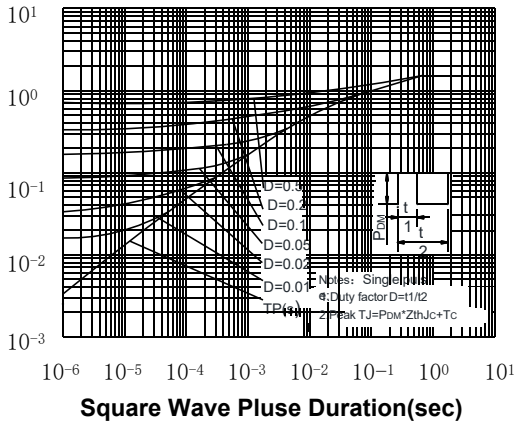
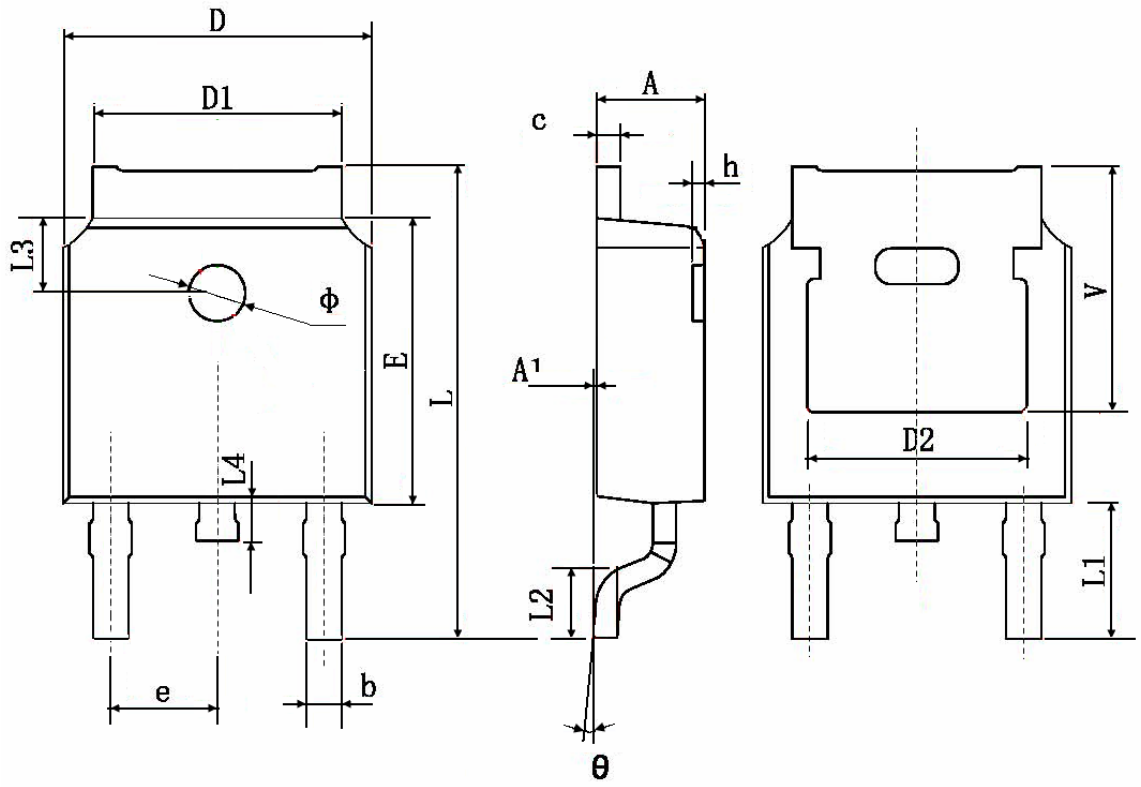


Figure 11. Transient Thermal Response Curve

TO-252-2L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.83 TYP.		0.190 TYP.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.800	10.400	0.386	0.409
L1	2.900 TYP.		0.114 TYP.	
L2	1.400	1.700	0.055	0.067
L3	1.600 TYP.		0.063 TYP.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.350 TYP.		0.211 TYP.	