



**ER80N03D**

**30V N-Channel MOSFET**

**Features**

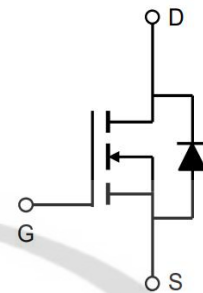
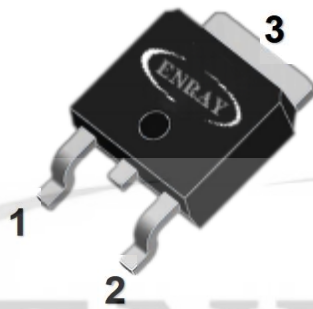
The ER80N03D uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.

**Product Summary**

$V_{DS}$	30V
$I_D$	80A
$R_{DS(ON)}$ (at $V_{GS}=10V$ )	< 6m $\Omega$
$R_{DS(ON)}$ (at $V_{GS}=4.5V$ )	< 8m $\Omega$

**TO-252**

- 1.GATE
- 2.SOURCE
- 3.DRAIN



**Order Information**

Product	Package	Marking	Packing
ER80N03D	TO-252	80N03****	2500PCS/Reel

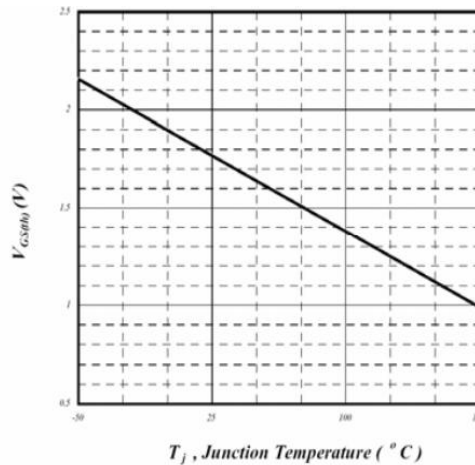
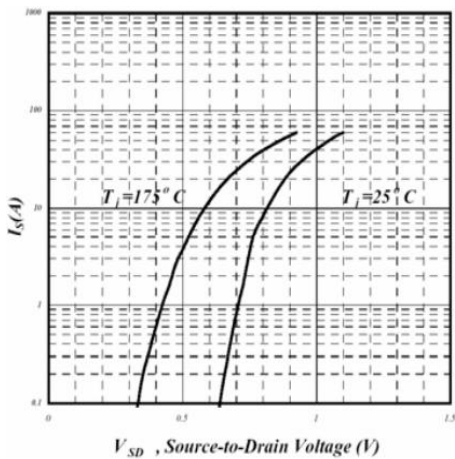
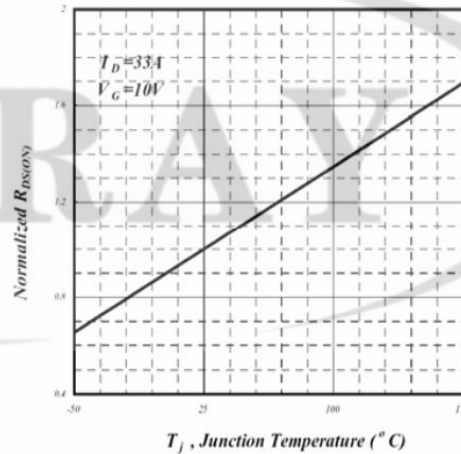
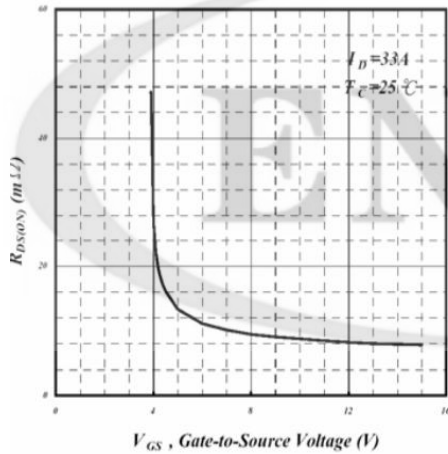
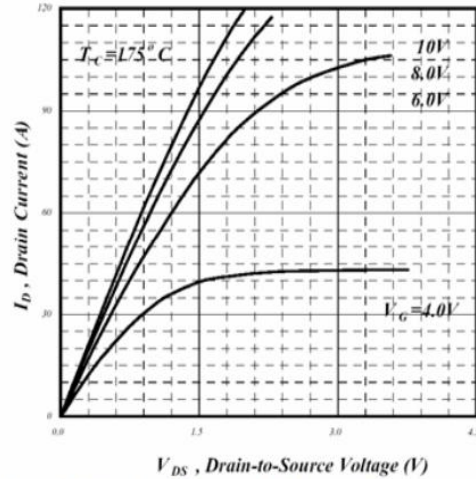
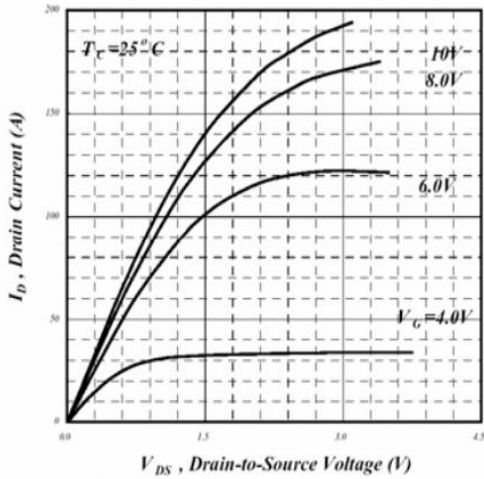
**Maximum Ratings(Ta=25°C unless otherwise noted)**

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	30	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	
Continuous Drain Current	$I_D$	80	A
Pulsed Drain Current ①	$I_{DM}$	170	
Continuous Source-Drain Current(Diode Conduction)	$I_S$	80	
Power Dissipation ②	PD	53	W
Thermal Resistance from Junction to Ambient (t $\leq$ 5s)	$R_{\theta JA}$	100	$^{\circ}C/W$
Operating Junction	$T_J$	150	$^{\circ}C$
Storage Temperature	TSTG	-55~+150	$^{\circ}C$

**Electrical Characteristics(T<sub>J</sub>=25°C unless otherwise noted)**

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static Parameters ③</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA	30			V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> = 250μA	1		3	V
Gate-Body leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> = ±20V			±100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 25V, V <sub>GS</sub> =0V			1	μA
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 30A		4	6	mΩ
	R <sub>DS(on)</sub>	V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 25A		6	8	mΩ
Forward Transconductance	g <sub>fs</sub>	V <sub>DS</sub> = 25V, I <sub>D</sub> = 30A		35		S
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> = 3A, V <sub>GS</sub> =0V		0.8	1.3	V
<b>Dynamic Parameters ④</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = 25V, V <sub>GS</sub> =0V, f=1MHz		1485		pF
Output Capacitance	C <sub>oss</sub>			245		pF
Reverse Transfer Capacitance	C <sub>rss</sub>			170		pF
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = 25V, V <sub>GS</sub> = 10V, I <sub>D</sub> = 33A		16.5		nC
Gate Source Charge	Q <sub>gs</sub>			5		nC
Gate Drain Charge	Q <sub>gd</sub>			10.3		nC
<b>Switching Parameters ④</b>						
Turn-On DelayTime	t <sub>d(on)</sub>	V <sub>DD</sub> = 25V R <sub>L</sub> = 18Ω, I <sub>D</sub> = 33A, V <sub>GEN</sub> = 10V,R <sub>g</sub> = 18Ω		8.2		ns
Turn-On Rise Time	t <sub>r</sub>			105		ns
Turn-Off DelayTime	t <sub>d(off)</sub>			22		ns
Turn-Off Fall Time	t <sub>f</sub>			8.5		ns
<b>Note :</b>						
1. Repetitive Rating : Pulse width limited by maximum junction temperature.						
2. Surface Mounted on FR4 Board, t < 5 sec.						
3. Pulse Test : Pulse Width≤300μs, Duty Cycle ≤ 2%.						
4. Guaranteed by design, not subject to production testing.						

Typical Electrical and Thermal Characteristics



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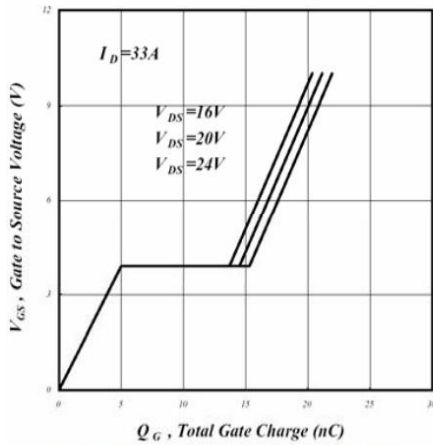


Fig 9. Gate Charge Characteristics

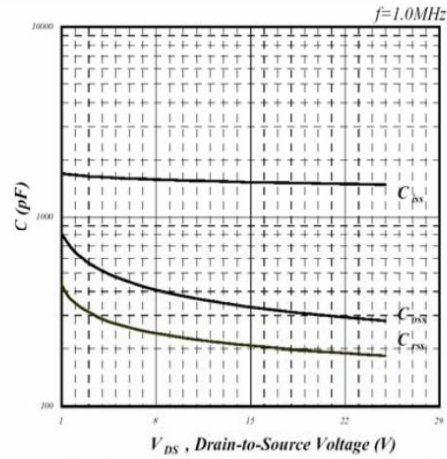


Fig 10. Typical Capacitance Characteristics

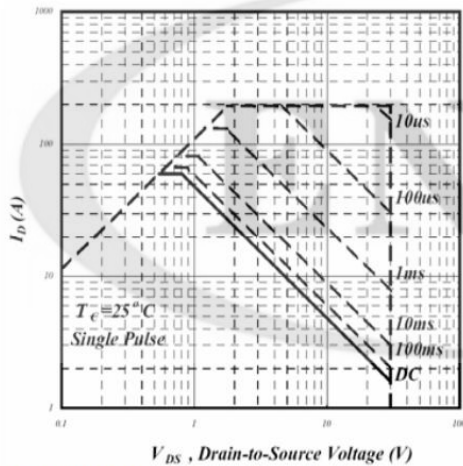


Fig 7. Maximum Safe Operating Area

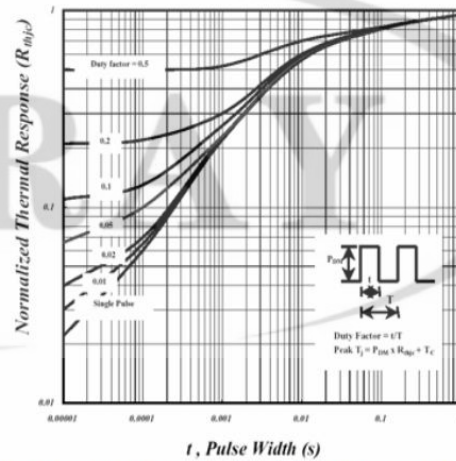


Fig 8. Effective Transient Thermal Impedance

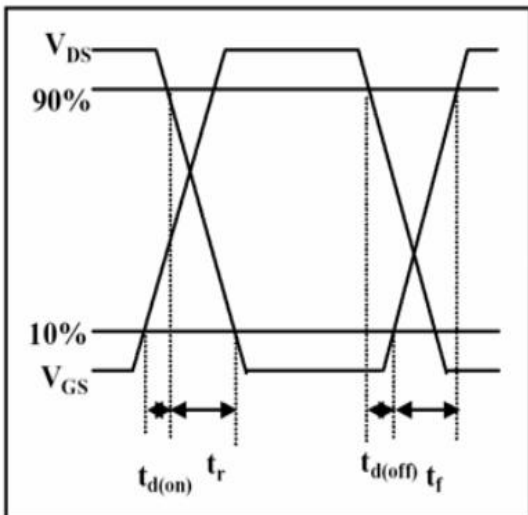


Fig 11. Switching Time Waveform

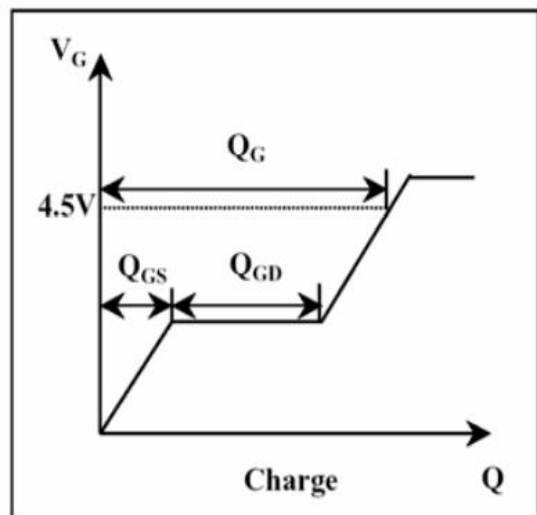
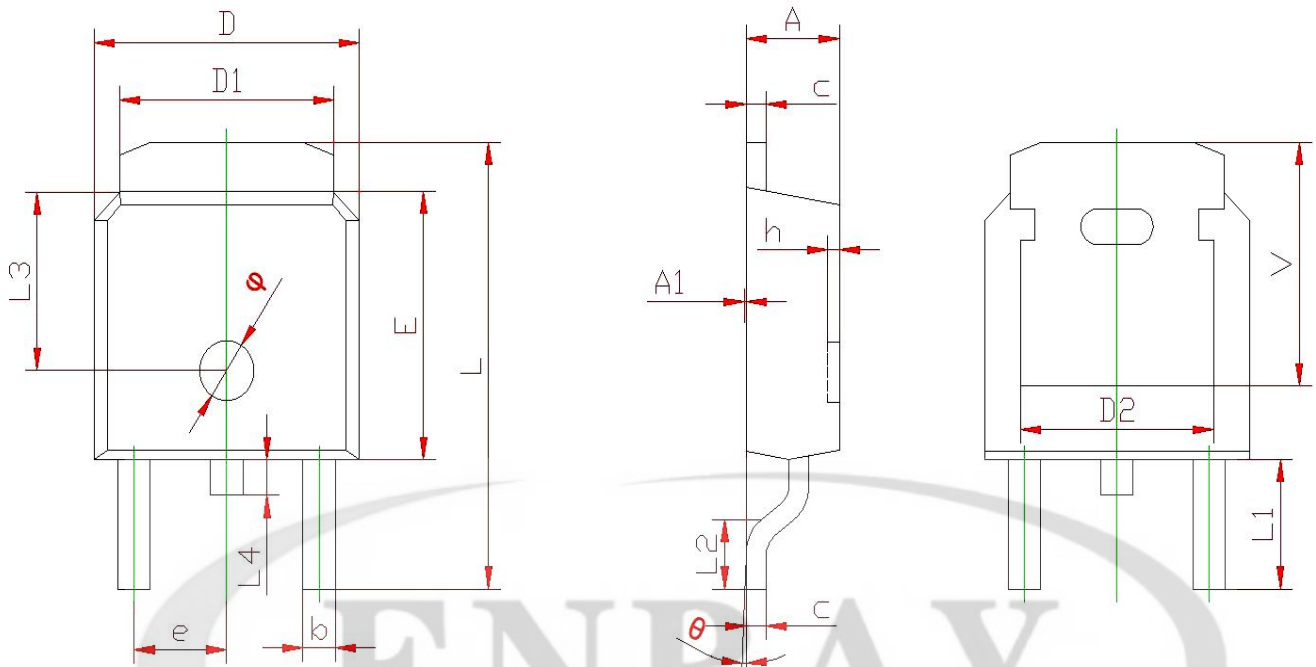


Fig 12. Gate Charge Waveform

**TO-252 Package Outline Dimensions**


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	4.800 REF		0.189 REF	
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 REF		0.114 REF	
L2	1.400	1.700	0.055	0.067
L3	4.000REF		0.157 REF	
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	5.5000REF		0.217 REF	