

30V DUAL N-Channel Enhancement Mode MOSFET

Description

The TFD250N03U uses advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge. The complementary MOSFETs may be used to form a level shifted high side switch, and for a host of other applications.

General Features

$V_{DS} = 30V$, $I_D = 5A$

$R_{DS(ON)} = 26m\Omega$ (typ) @ $V_{GS} = 10V$

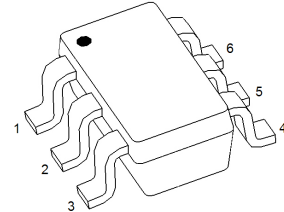
$R_{DS(ON)} = 30m\Omega$ (typ) @ $V_{GS} = 4.5V$

Application

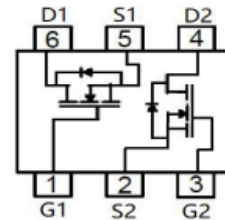
DC/DC Converter

Ideal for high-frequency switching and synchronous rectification

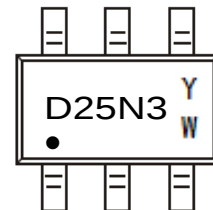
SOT-23-6



Schematic diagram



Marking



Y :year code W :week code

ABSOLUTE MAXIMUM RATINGS ($T_a = 25^\circ C$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current	I_D	5.0	A
Pulsed Drain Current (note 1)	I_{DM}	15	A
Maximum Power Dissipation	P_D	1.5	W
Thermal Resistance from Junction to Ambient (note 2)	$R_{\theta JA}$	68	$^\circ C/W$
Junction Temperature	T_J	150	$^\circ C$
Storage Temperature	T_{STG}	-55~+150	$^\circ C$
Lead Temperature for Soldering Purposes(1/8" from case for 8 s)	T_{LL}	260	$^\circ C$

MOSFET ELECTRICAL CHARACTERISTICS

T_a =25 °C unless otherwise specified

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
STATIC CHARACTERICTISCS						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D =250μA	30			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =29V,V _{GS} = 0V			1.0	uA
Gate-body leakage current	I _{GSS}	V _{GS} =±12V, V _{DS} = 0V			±100	nA
Gate threshold voltage (note 3)	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	0.7	0.85	1.0	V
Drain-source on-resistance (note 3)	R _{DS(on)}	V _{GS} =10V, I _D =5.0A		26	32	mΩ
		V _{GS} =4.5V, I _D =4.0A		30	40	mΩ
Forward tranconductance (note 3)	g _{FS}	V _{DS} =5V, I _D =2A		10		s
Diode forward voltage (note 3)	V _{SD}	I _S =3.0A, V _{GS} = 0V			1.0	V
DYNAMIC CHARACTERICTISCS (note4)						
Input Capacitance	C _{iss}	V _{DS} =15V,V _{GS} =0V,f =1MHz		755		pF
Output Capacitance	C _{oss}			65		pF
Reverse Transfer Capacitance	C _{rss}			48		pF
SWITCHING CHARACTERICTISCS (note 4)						
Turn-on delay time	t _{d(on)}	V _{GS} =5V, V _{DD} =15V, R _L =3.3Ω , R _{GEN} =6.0Ω		5.4		ns
Turn-on rise time	t _r			7.5		ns
Turn-off delay time	t _{d(off)}			21		ns
Turn-off fall time	t _f			6.8		ns
Total Gate Charge	Q _g	V _{DS} =15V,V _{GS} =4.5V,I _D =4A		7.2		nC
Gate-Source Charge	Q _{gs}			1.6		nC
Gate-Drain Charge	Q _{gd}			3.7		nC

Notes :

- 1.Repetitive rating: Pluse width limited by maximum junction temperature
- 2.Surface Mounted on FR4 board, t≤10 sec.
3. Pulse test : Pulse width≤300μs, duty cycle≤2%.
4. Guaranteed by design, not subject to production.

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

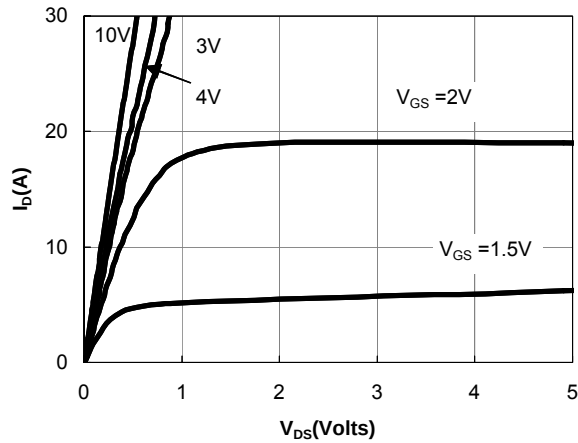


Figure 1: On-Regions Characteristic CS

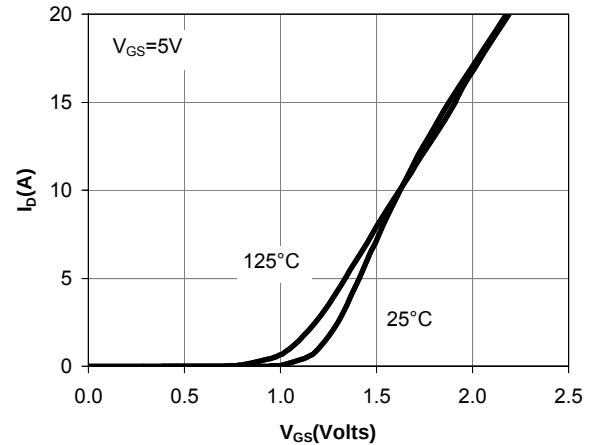


Figure 2: Transfer Characteristics

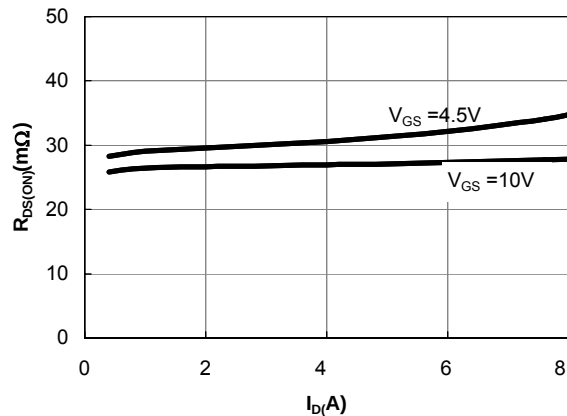


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

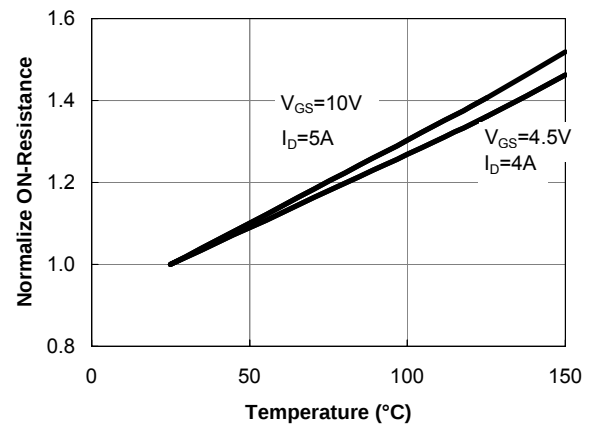


Figure 4: On-Resistance vs. Junction Temperature

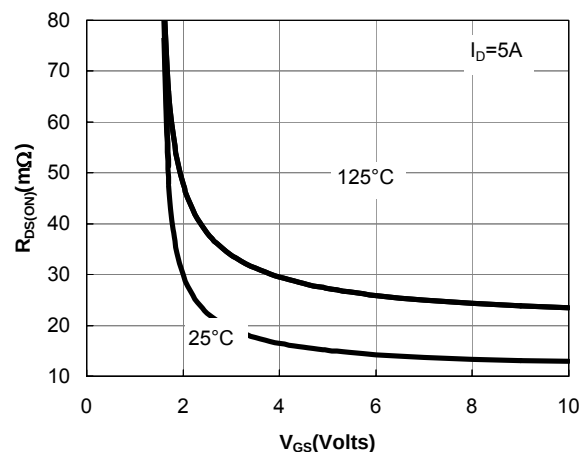


Figure 5: On-Resistance vs. Gate-Source Voltage

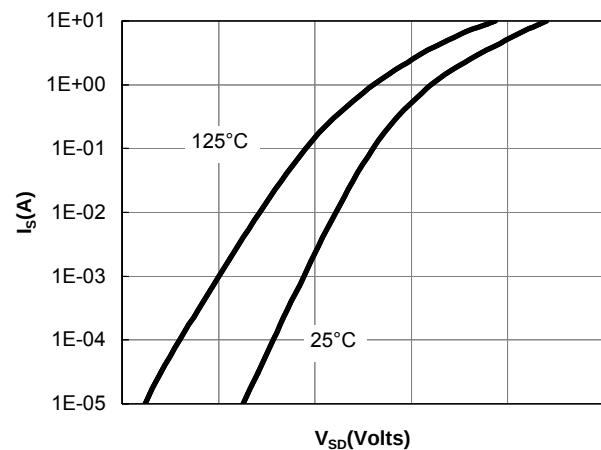
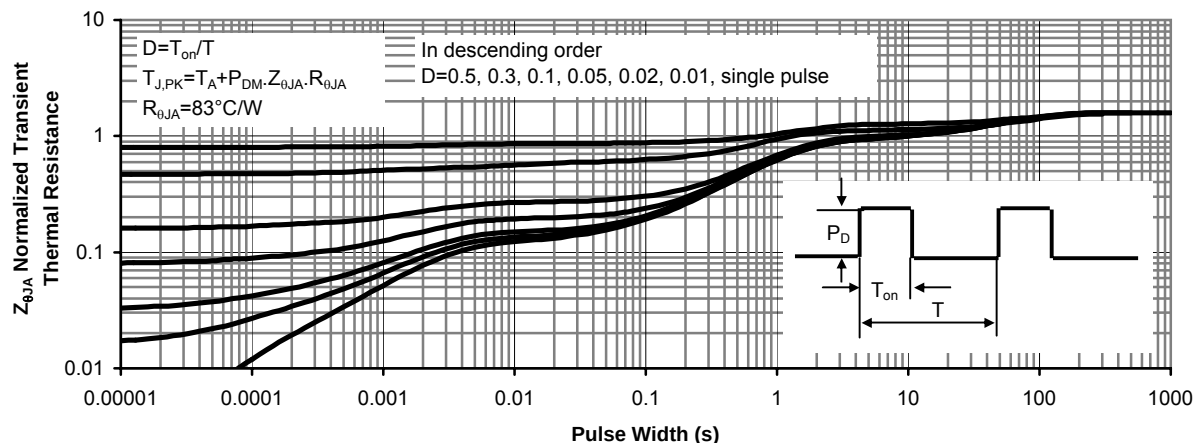
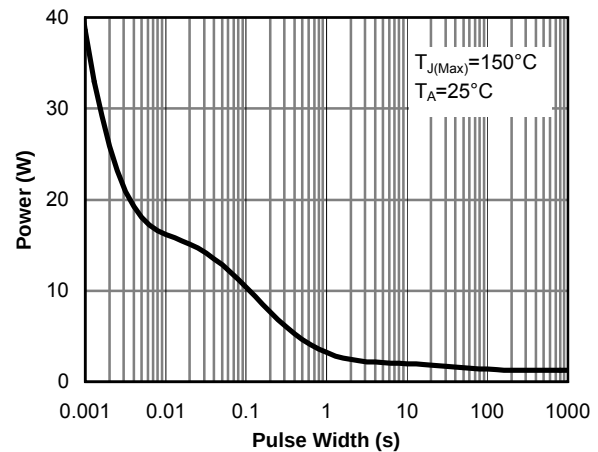
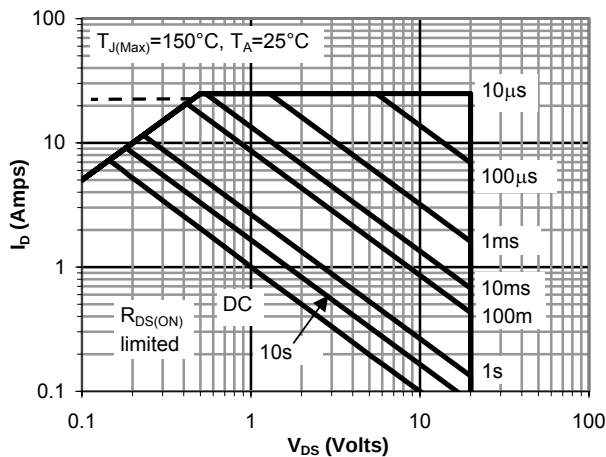
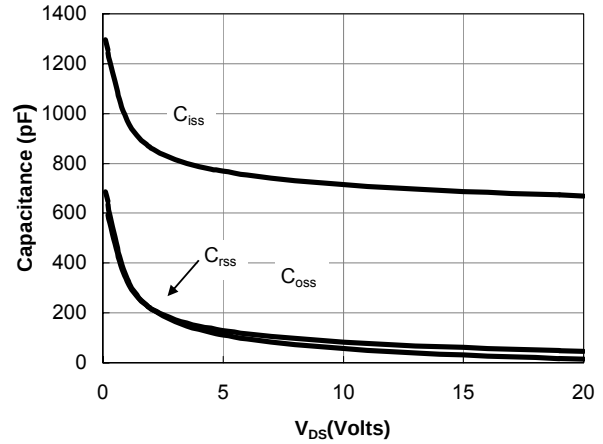
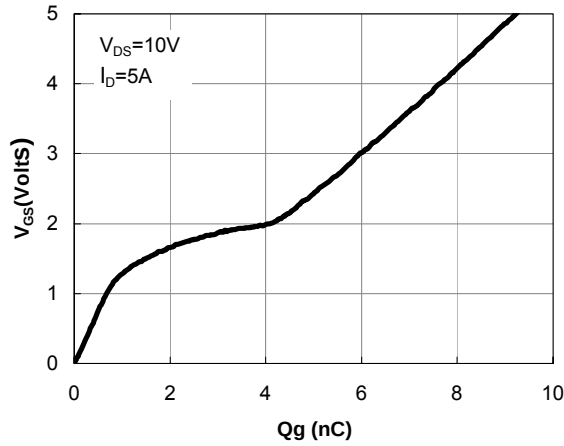


Figure 6: Body-Diode Characteristics

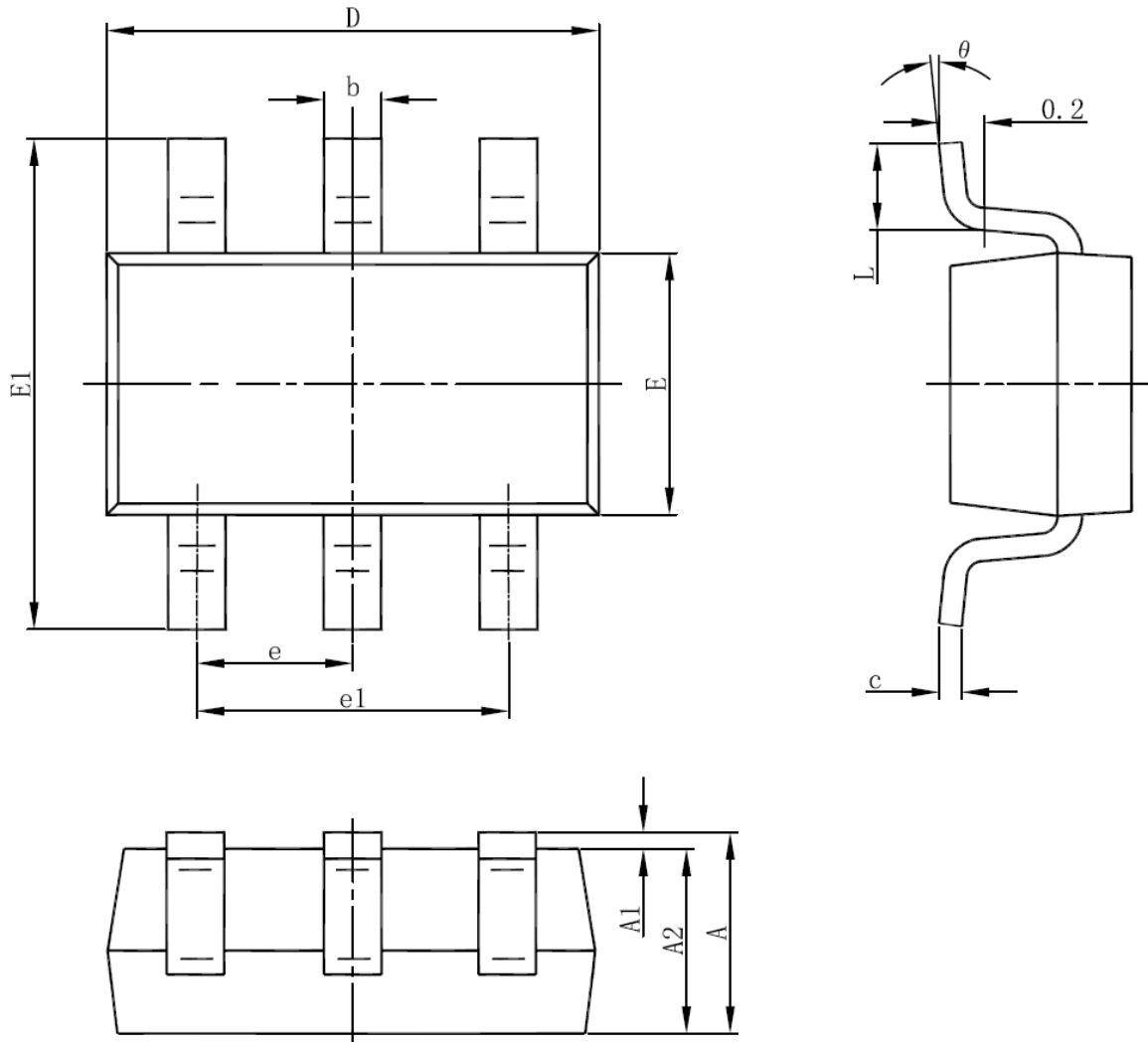
TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS



SOT-23-6 Plastic-Encapsulate MOSFETS

TFD250N03U

SOT23-6 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°