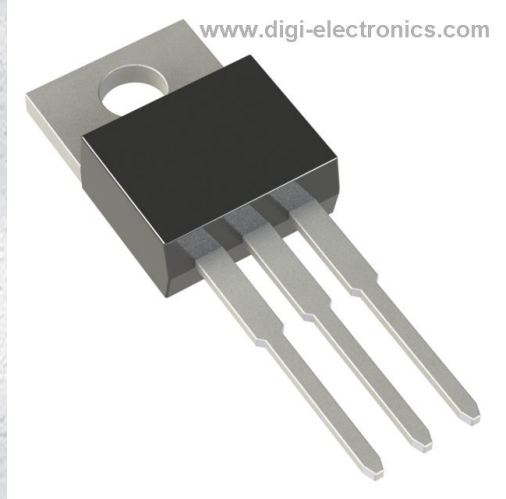
IXTP60N10T Datasheet



https://www.DiGi-Electronics.com

DiGi Electronics Part Number	IXTP60N10T-DG
Manufacturer	IXYS
Manufacturer Product Number	IXTP60N10T
Description	MOSFET N-CH 100V 60A TO220AB
Detailed Description	N-Channel 100 V 60A (Tc) 176W (Tc) Through Hole TO-220-3

Tel: +00 852-30501935

RFQ Email: Info@DiGi-Electronics.com

Purchase and inquiry

Manufacturer Product Number:	Manufacturer:
IXTP60N10T	IXYS
Series:	Product Status:
Trench	Active
FET Type:	Technology:
N-Channel	MOSFET (Metal Oxide)
Drain to Source Voltage (Vdss):	Current - Continuous Drain (Id) @ 25°C:
100 V	60A (Tc)
Drive Voltage (Max Rds On, Min Rds On):	Rds On (Max) @ Id, Vgs:
10V	18mOhm @ 25A, 10V
Vgs(th) (Max) @ Id:	Gate Charge (Qg) (Max) @ Vgs:
4.5V @ 50µA	49 nC @ 10 V
Vgs (Max):	Input Capacitance (Ciss) (Max) @ Vds:
±30V	2650 pF @ 25 V
FET Feature:	Power Dissipation (Max):
-	176W (Tc)
Operating Temperature:	Mounting Type:
-55°C ~ 175°C (TJ)	Through Hole
Supplier Device Package:	Package / Case:
TO-220-3	TO-220-3
Base Product Number:	
IXTP60	

Environmental & Export classification

RoHS Status:	Moisture Sensitivity Level (MSL):
ROHS3 Compliant	1 (Unlimited)
REACH Status:	ECCN:
REACH Unaffected	EAR99
HTSUS:	
8541.29.0095	

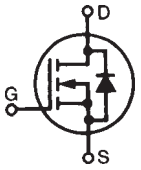
IXYS

Trench™ Power MOSFET

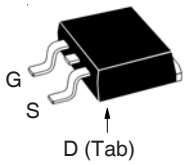
IXTA60N10T
IXTP60N10T

V_{DSS} = 100V
I_{D25} = 60A
$R_{DS(on)}$ ≤ 18mΩ

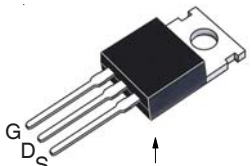
N-Channel Enhancement Mode
Avalanche Rated



TO-263 (IXTA)



TO-220 (IXTP)



G = Gate D = Drain
S = Source Tab = Drain

Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	T_J = 25°C to 175°C	100	V
V_{DGR}	T_J = 25°C to 175°C, R_{GS} = 1MΩ	100	V
V_{GSS}	Continuous	± 20	V
V_{GSM}	Transient	± 30	V
I_{D25}	T_C = 25°C	60	A
I_{DM}	T_C = 25°C, Pulse Width Limited by T_{JM}	180	A
I_A	T_C = 25°C	10	A
E_{AS}	T_C = 25°C	500	mJ
P_D	T_C = 25°C	176	W
T_J		-55 ... +175	°C
T_{JM}		175	°C
T_{stg}		-55 ... +175	°C
T_L	Maximum Lead Temperature for Soldering	300	°C
T_{SOLD}	1.6 mm (0.062in.) from Case for 10s	260	°C
F_C	Mounting Force (TO-263)	10..65 / 2.2..14.6	N/lb
M_d	Mounting Torque (TO-220)	1.13 / 10	Nm/lb.in
Weight	TO-263	2.5	g
	TO-220	3.0	g

Symbol	Test Conditions (T_J = 25°C Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
BV_{DSS}	V_{GS} = 0V, I_D = 250μA	100			V
$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 50μA	2.5		4.5	V
I_{GSS}	V_{GS} = ± 20V, V_{DS} = 0V			±100	nA
I_{DSS}	V_{DS} = V_{DSS}, V_{GS} = 0V			1	μA
	T_J = 150°C			100	μA
$R_{DS(on)}$	V_{GS} = 10V, I_D = 25A, Notes 1& 2		14.8	18.0	mΩ

Features

- Ultra-Low On Resistance
- Avalanche Rated
- Low Package Inductance
  - Easy to Drive and to Protect
- 175°C Operating Temperature
- Fast Intrinsic Diode

Advantages

- Easy to Mount
- Space Savings
- High Power Density

Applications

- Automotive
  - Motor Drives
  - 42V Power Bus
  - ABS Systems
- DC/DC Converters and Off-line UPS
- Primary Switch for 24V and 48V Systems
- Distributed Power Architechtures and VRMs
- Electronic Valve Train Systems
- High Current Switching Applications
- High Voltage Synchronous Recifier

IXYS

IXTA60N10T
IXTP60N10T

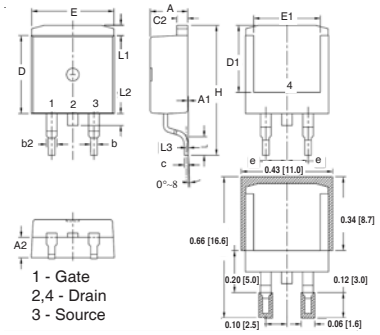
Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	V_{DS} = 10V, I_D = 30A, Note 1	25	42		S
C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		2650		pF
C_{oss}			335		pF
C_{rss}			60		pF
$t_{d(on)}$	**Resistive Switching Times**		27		ns
t_r	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 10A		40		ns
$t_{d(off)}$	R_G = 15Ω (External)		43		ns
t_f			37		ns
$Q_{g(on)}$	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 10A		49		nC
Q_{gs}			15		nC
Q_{gd}			11		nC
R_{thJC}				0.85	°C/W
R_{thCH}	TO-220		0.50		°C/W

Source-Drain Diode

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
I_S	V_{GS} = 0V			60	A
I_{SM}	Repetitive, Pulse Width Limited by T_{JM}			240	A
V_{SD}	I_F = 25A, V_{GS} = 0V, Note 1			1.2	V
t_{rr}	I_F = 30A, V_{GS} = 0V		59		ns
I_{RM}	-di/dt = 100A/μs, V_R = 50V		5.1		A
Q_{RM}			180		nC

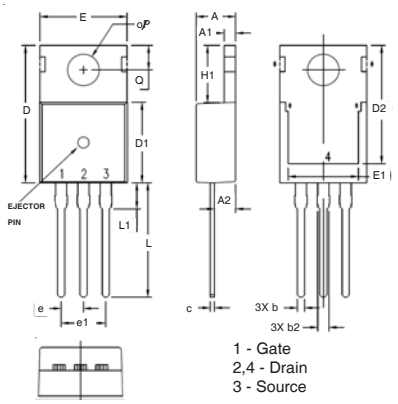
Notes: 1. Pulse test, t ≤ 300μs; duty cycle, d ≤ 2%.
2. On through-hole packages, $R_{DS(on)}$ Kelvin test contact location must be 5mm or less from the package body.

TO-263 Outline



SYM	INCHES MIN	INCHES MAX	MILLIMETER MIN	MILLIMETER MAX
A	.170	.185	4.30	4.70
A1	.000	.008	0.00	0.20
A2	.091	.098	2.30	2.50
b	.028	.035	0.70	0.90
b2	.046	.060	1.18	1.52
C	.018	.024	0.45	0.60
C2	.049	.060	1.25	1.52
D	.340	.370	8.63	9.40
D1	.300	.327	7.62	8.30
E	.380	.410	9.65	10.41
E1	.270	.330	6.86	8.38
e	.100 BSC		2.54 BSC	
H	.580	.620	14.73	15.75
L	.075	.105	1.91	2.67
L1	.039	.060	1.00	1.52
L2	—	.070	—	1.77
L3	.010 BSC		0.254 BSC	

TO-220 Outline



SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	.169	.185	4.30	4.70
A1	.047	.055	1.20	1.40
A2	.079	.106	2.00	2.70
b	.024	.039	0.60	1.00
b2	.045	.057	1.15	1.45
c	.014	.026	0.35	0.65
D	.587	.626	14.90	15.90
D1	.335	.370	8.50	9.40
(D2)	.500	.531	12.70	13.50
E	.382	.406	9.70	10.30
(E1)	.283	.323	7.20	8.20
e	.100 BSC		2.54 BSC	
e1	.200 BSC		5.08 BSC	
H1	.244	.268	6.20	6.80
L	.492	.547	12.50	13.90
L1	.110	.154	2.80	3.90
ØP	.134	.150	3.40	3.80
Q	.106	.126	2.70	3.20

Fig. 1. Output Characteristics @ T_J = 25°C

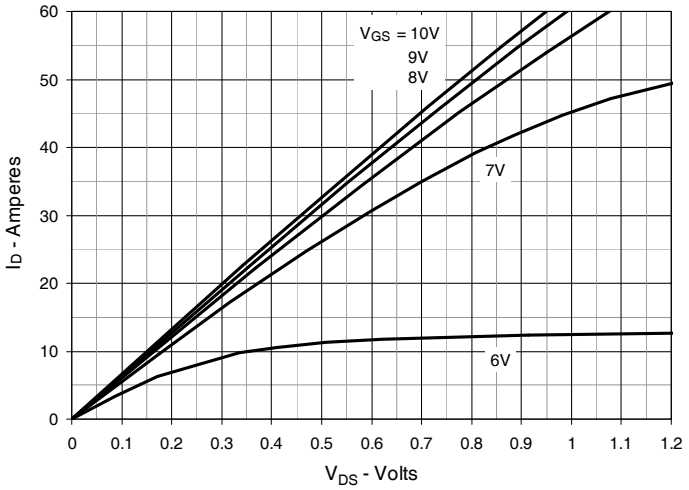


Fig. 2. Extended Output Characteristics @ T_J = 25°C

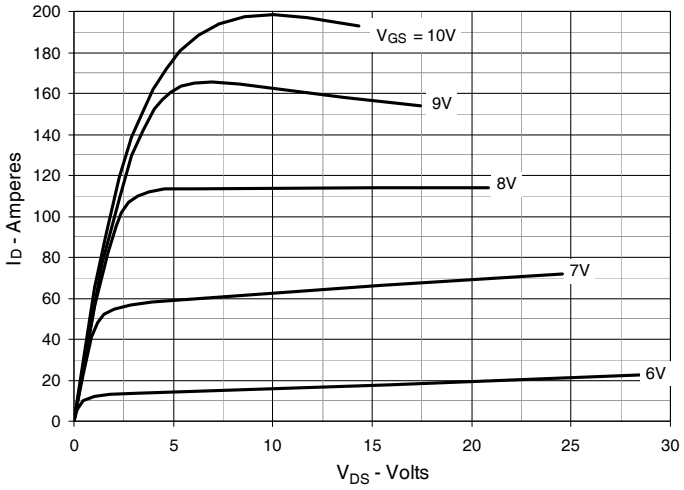


Fig. 3. Output Characteristics @ T_J = 150°C

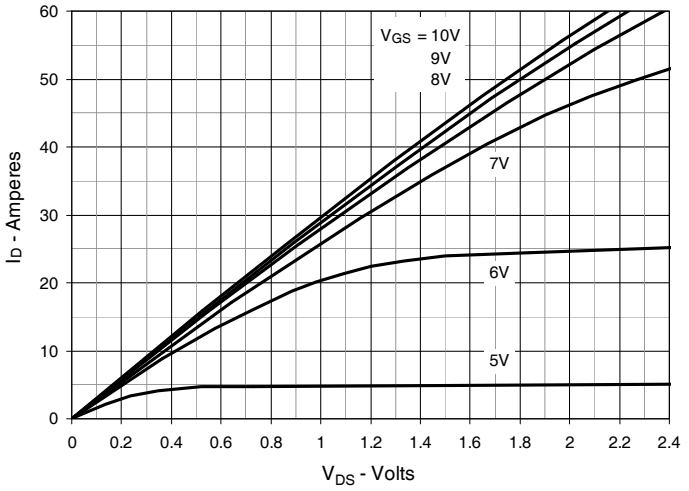


Fig. 4. $R_{DS(on)}$ Normalized to I_D = 30A Value vs. Junction Temperature

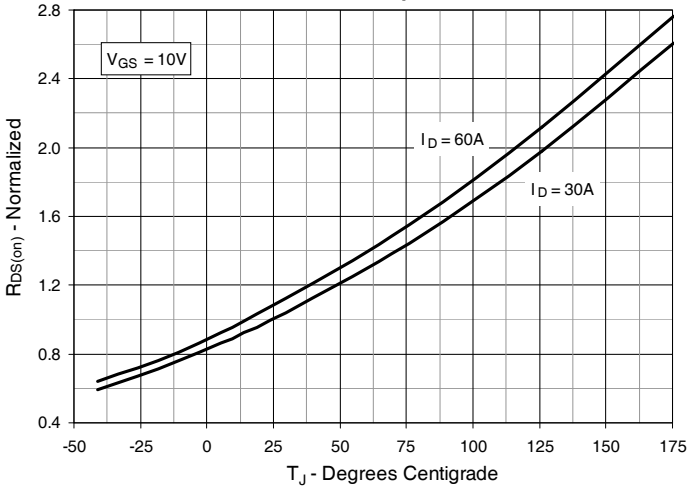


Fig. 5. $R_{DS(on)}$ Normalized to I_D = 30A Value vs. Drain Current

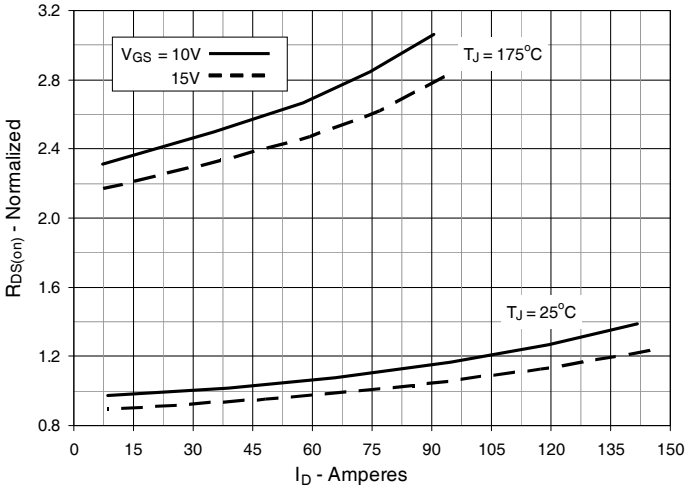


Fig. 6. Drain Current vs. Case Temperature

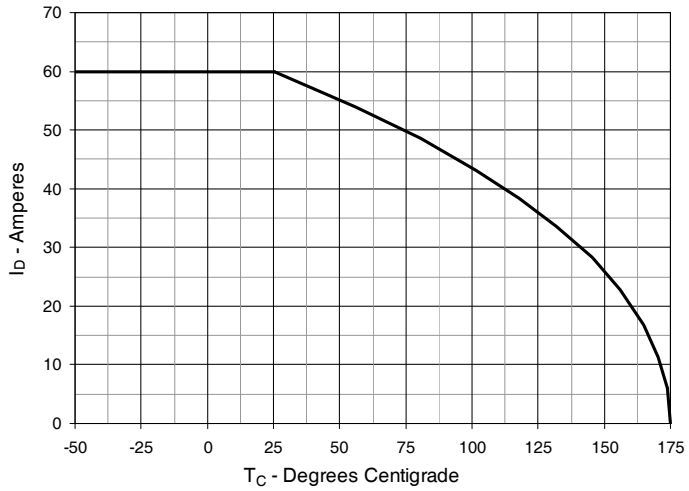


Fig. 7. Input Admittance

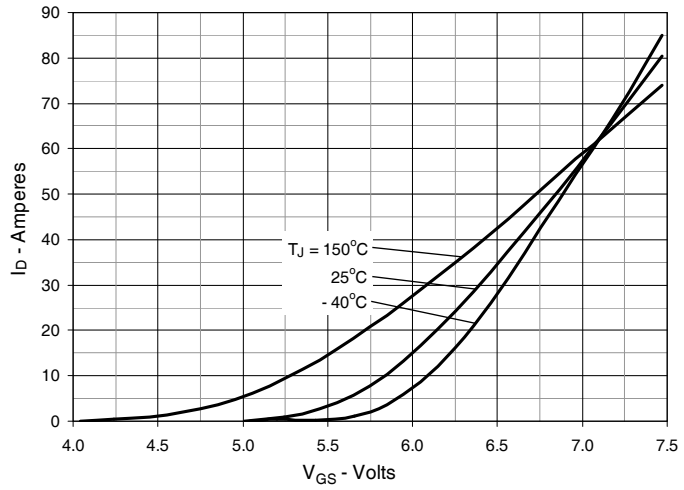


Fig. 8. Transconductance

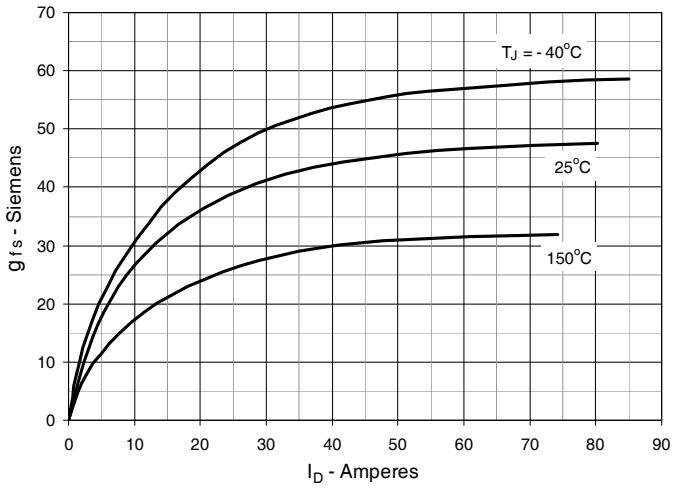


Fig. 9. Forward Voltage Drop of Intrinsic Diode

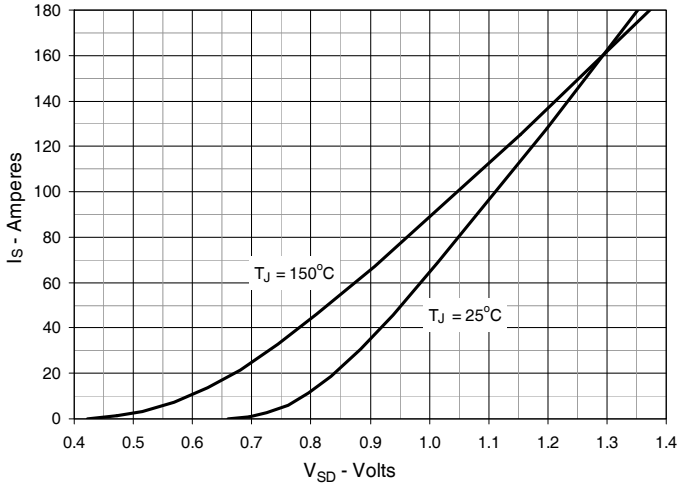


Fig. 10. Gate Charge

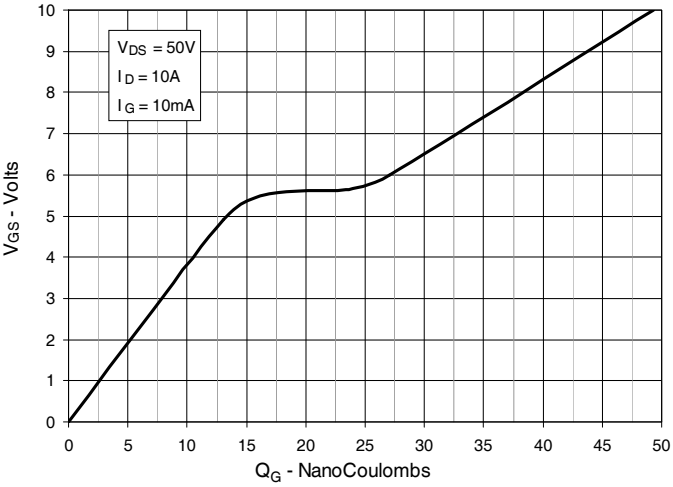


Fig. 11. Capacitance

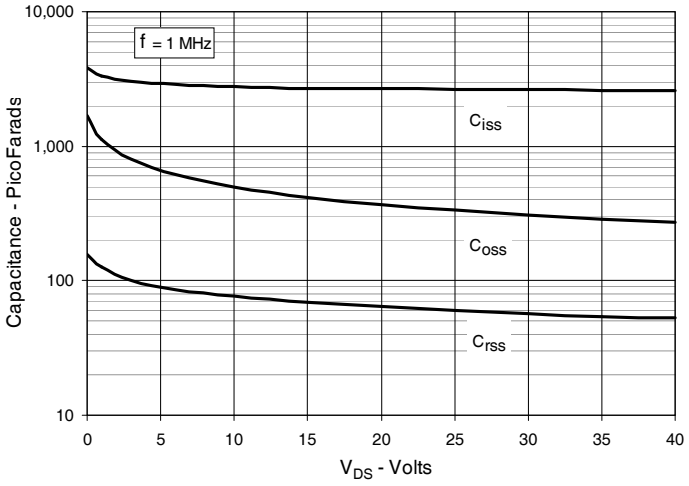


Fig. 12. Maximum Transient Thermal Impedance

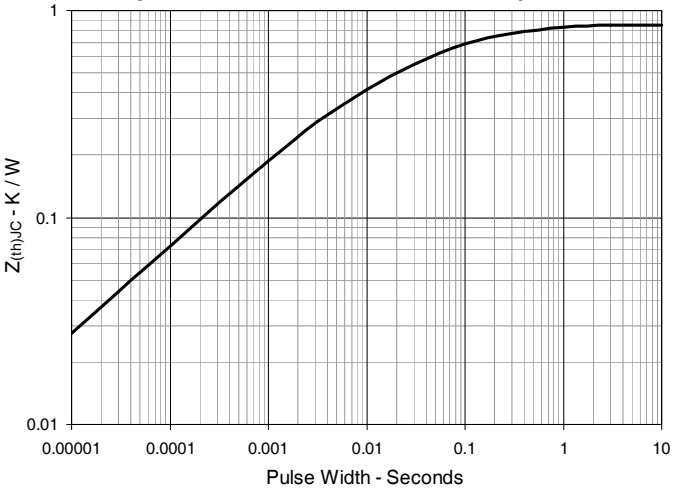


Fig. 13. Resistive Turn-on Rise Time vs. Junction Temperature

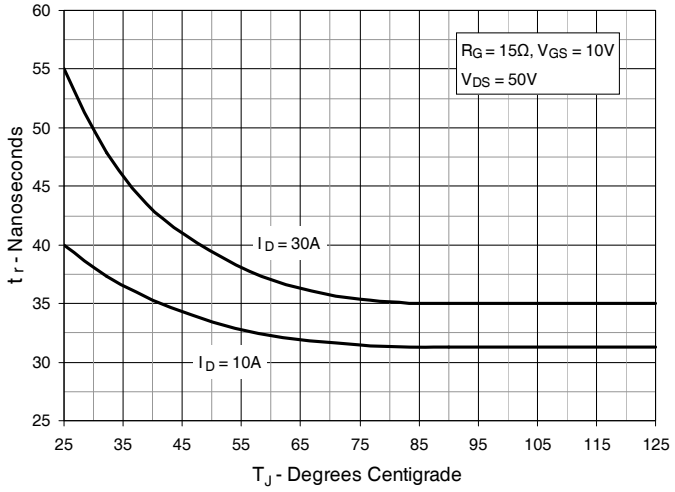


Fig. 14. Resistive Turn-on Rise Time vs. Drain Current

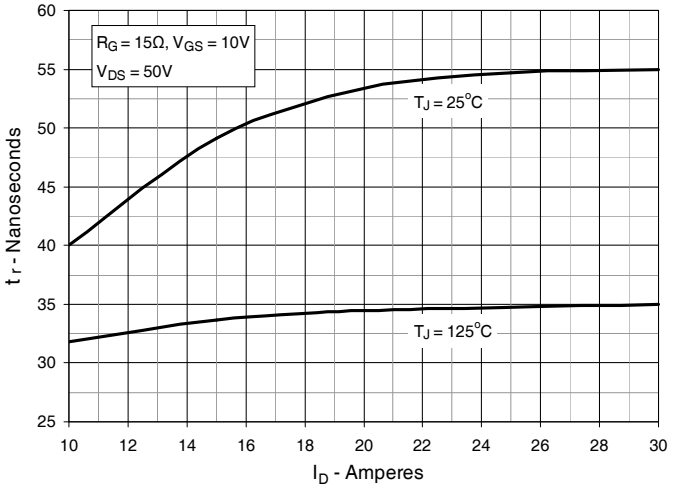


Fig. 15. Resistive Turn-on Switching Times vs. Gate Resistance

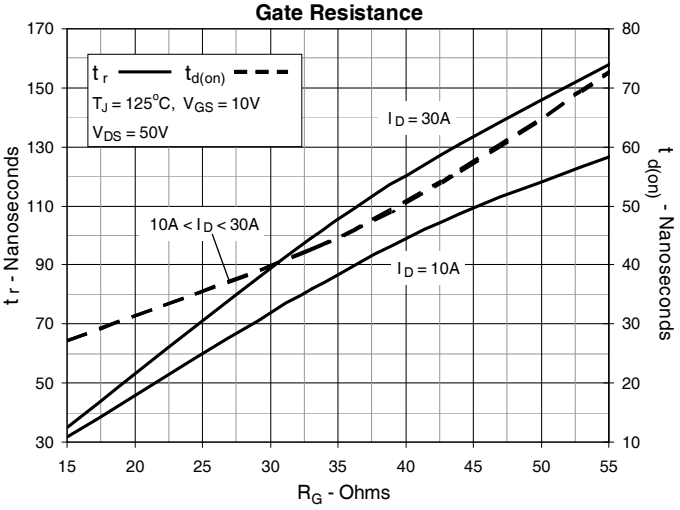


Fig. 16. Resistive Turn-off Switching Times vs. Junction Temperature

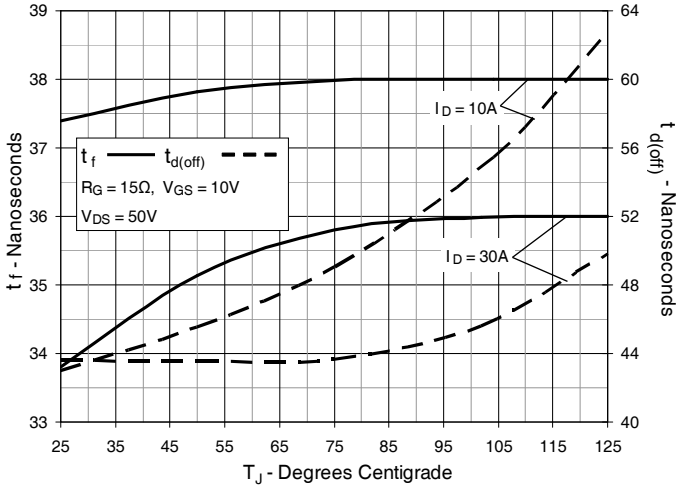


Fig. 17. Resistive Turn-off Switching Times vs. Drain Current

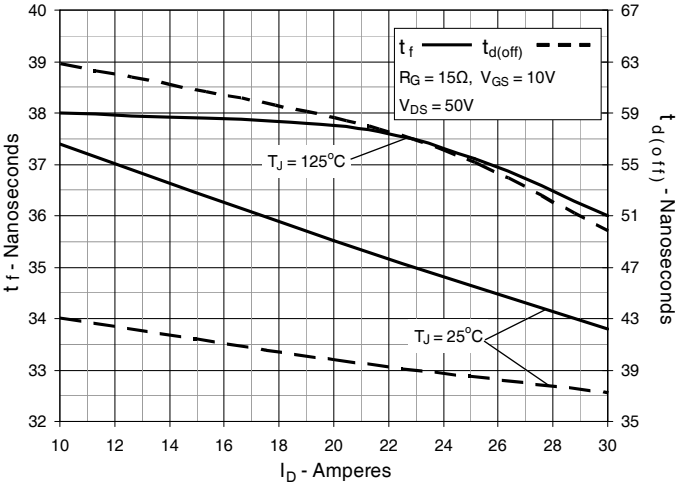
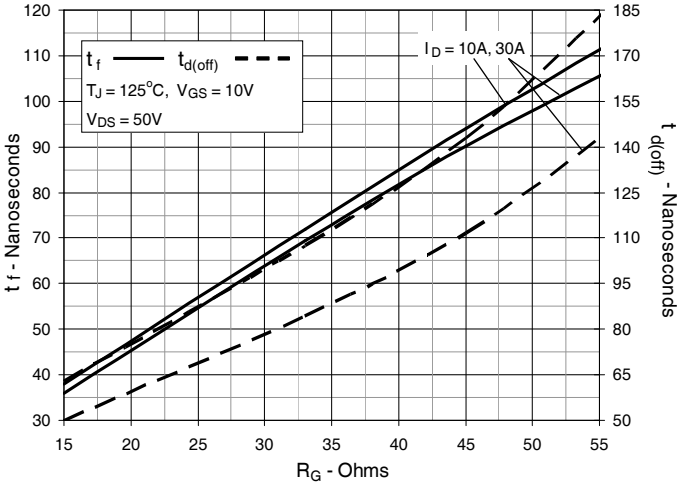


Fig. 18. Resistive Turn-off Switching Times vs. Gate Resistance



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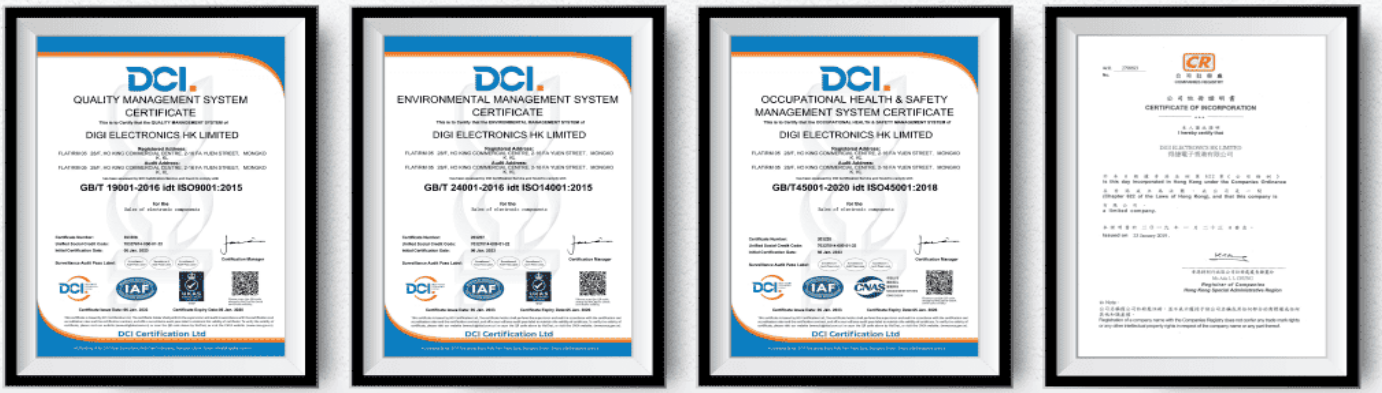

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