

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
-40V	4.8m Ω @-10V	-130A
	6.5m Ω @4.5V	

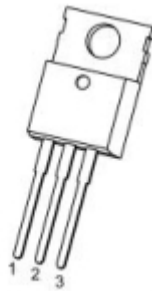
Feature

- Fast Switching
- Low Gate Charge and Rdson
- Advanced Split Gate Trench Technology
- 100% Single Pulse avalanche energy Test

Applications

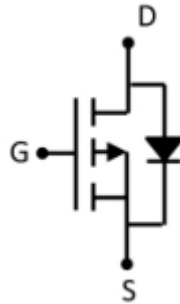
- Power switching application
- PWM Application
- DC-DC Converter

Package

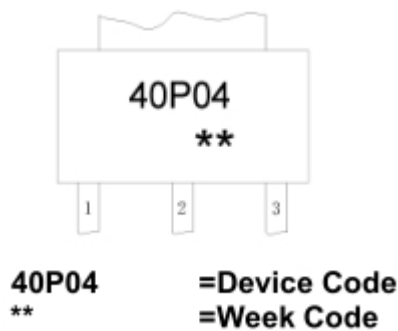


TO-220-3L(1:G 2:D 3:S)

Circuit diagram



Marking



Absolute maximum ratings

(T_a=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V _{DS}	-40	V
Gate-Source Voltage	V _{GS}	±20	V
Continuous Drain Current (T _c =25°C)	I _D	-130	A
Pulsed Drain Current ²	I _{DM}	-520	A
Single Pulse Avalanche Energy ³	E _{AS}	979	mJ
Total Power Dissipation ⁴ (T _c =25°C)	P _D	150	W
Thermal Resistance Junction-Case ¹	R _{θJC}	0.83	°C/W
Storage Temperature Range	T _{STG}	-55 to 150	°C
Operating Junction Temperature Range	T _J	-55 to 150	°C

Electrical characteristics

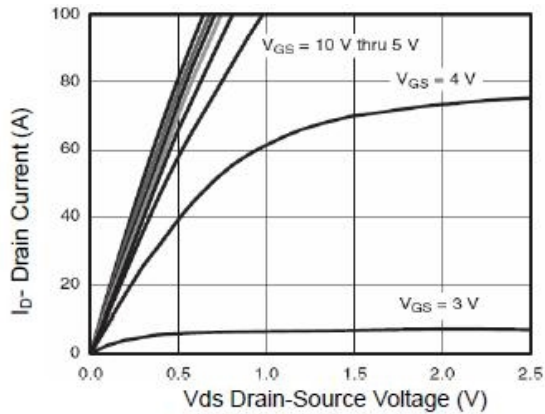
($T_A=25^{\circ}\text{C}$, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV (BR)DSS	V _{GS} = 0V, I _D = -250μA	-40			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} = -32V, V _{GS} = 0V, T _J =25°C			-1	uA
Gate-Source Leakage	I _{GSS}	V _{GS} = ±20V, V _{DS} = 0V			±100	uA
Gate-Source Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250μA	-1	-1.7	-2.5	V
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} = -10V, I _D = -20A		4.8	6	mΩ
		V _{GS} = -4.5V, I _D = -20A		6.5	8.6	
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} = -20V, f=1MHz		7010		pF
Output Capacitance	C _{oss}			640		
Reverse Transfer Capacitance	C _{rss}			450		
Switching Characteristics						
Total Gate Charge	Q _g	V _{DS} = -20V, , I _D = -20A V _{GS} = -10V		74		nC
Gate-Source Charge	Q _{gs}			22		
Gate-Drain Charge	Q _{gd}			18		
Turn-On Delay Time	T _{d(on)}	V _{DD} = -20V, I _D = -20A , V _{GS} = -10V, R _G =2.4Ω		10		nS
Rise Time	T _r			15		
Turn-Off Delay Time	T _{d(off)}			93		
Fall Time	T _f			20		
Drain-Source Diode Characteristics						
Diode Forward Voltage	V _{SD}	V _{GS} =0V,I _S = -1A, T _J =25°C			-1.2	V

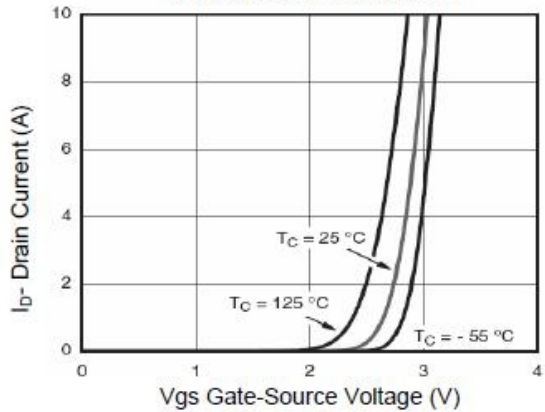
Note:

1. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
2. The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
3. The EAS data shows Max. rating . The test condition is $V_{DD}=-20V, V_{GS}=10V, L=0.5mH, R_g=25\Omega$
4. The power dissipation is limited by 150°C junction temperature

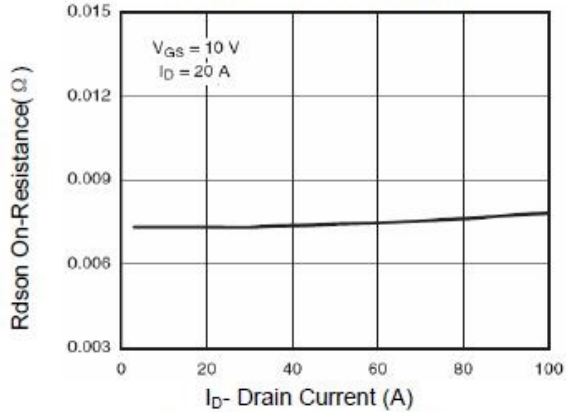
Typical Characteristics



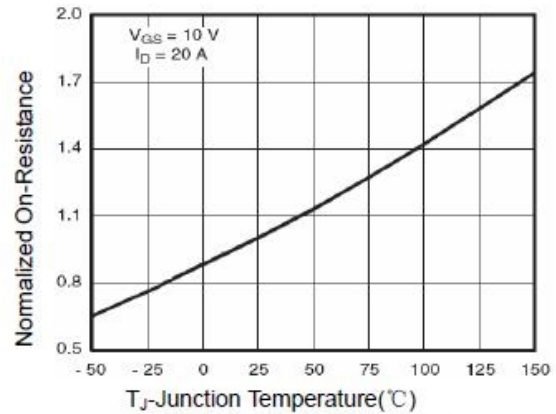
Output Characteristics



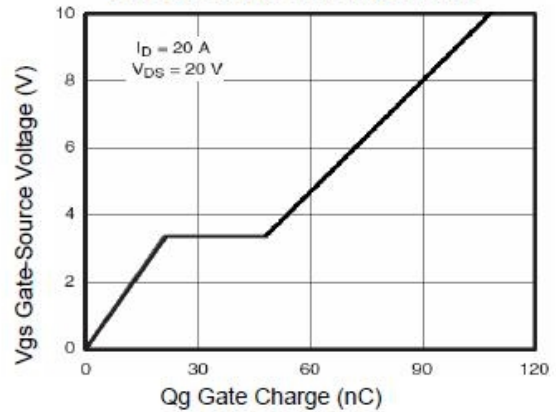
Transfer Characteristics



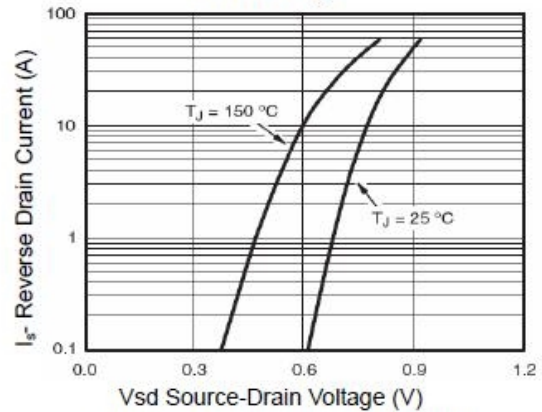
$R_{DS(on)}$ - Drain Current



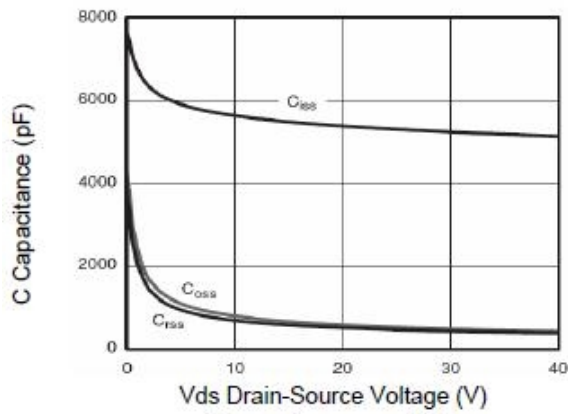
$R_{DS(on)}$ -Junction Temperature



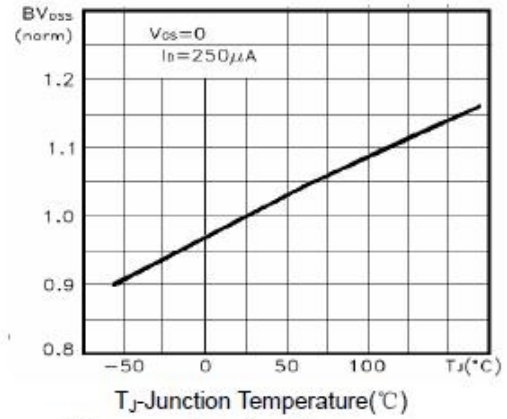
Gate Charge



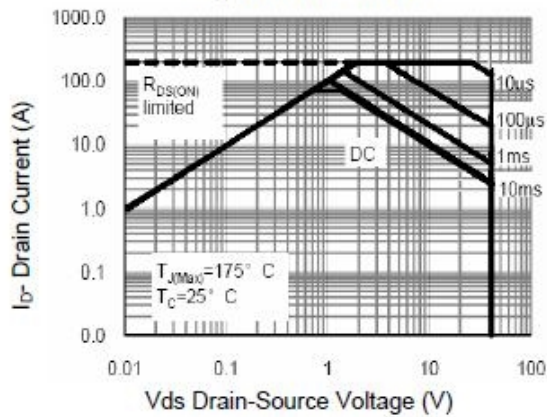
Source- Drain Diode Forward



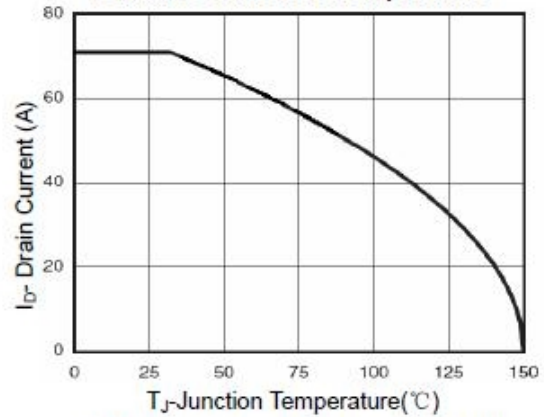
Capacitance vs V_{ds}



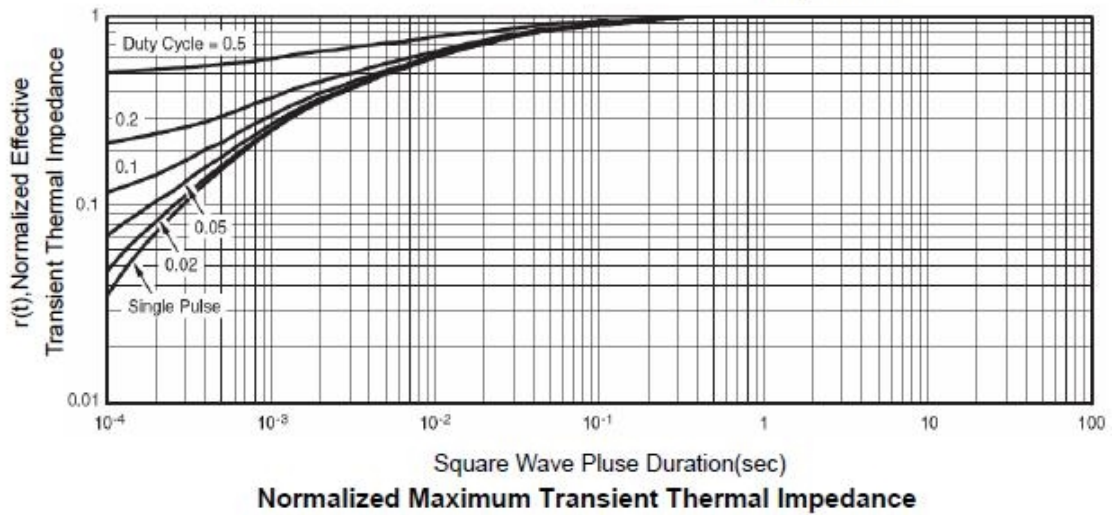
BV_{DSS} vs Junction Temperature



Safe Operation Area

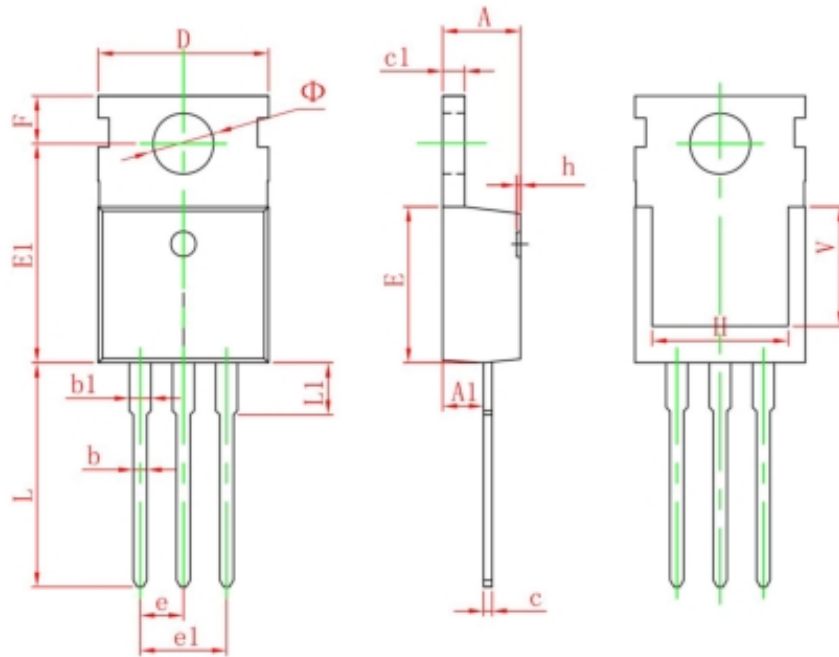


ID Current Derating vs Junction Temperature



Normalized Maximum Transient Thermal Impedance

TO-220-3L-C Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.400	4.600	0.173	0.181
A1	2.250	2.550	0.089	0.100
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.330	0.650	0.013	0.026
c1	1.200	1.400	0.047	0.055
D	9.910	10.250	0.390	0.404
E	8.950	9.750	0.352	0.384
E1	12.650	13.050	0.498	0.514
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
F	2.650	2.950	0.104	0.116
H	7.900	8.100	0.311	0.319
h	0.000	0.300	0.000	0.012
L	12.900	13.400	0.508	0.528
L1	2.850	3.250	0.112	0.128
V	6.900 REF.		0.276 REF.	
Φ	3.400	3.800	0.134	0.150